Southington Board of Education Meeting

Thursday, November 19, 2026 6:30 PM
John Weichsel Municipal Center Public Assembly Room
200 North Main Street
Southington, CT 06489

COMMITTEE OF THE WHOLE

1. CALL TO ORDER
2. Executive Session
   a. UPSEU PT/OT Contract Negotiations
   b. Legal Opinion - Student Clubs
   c. Student Matter
3. Reconvene Meeting - Regular Session 7:00 p.m.
4. Pledge of Allegiance - Moment of Silence
5. Celebration of Excellence
   a. 2025-2026 SNACT'S Rising Star Director of the Year
6. Approval of Minutes
   a. October 29, 2026
   b. November 4, 2026
7. Public Communications
   a. Communications from Student Board Representatives
   b. Communications from Board of Education
   c. Communications from Administration
   d. Communications from Public - Agenda Items Only
8. Committee Reports
   a. Policy & Personnel Committee Meeting - November 10, 2026
9. Superintendent's Report
   a. Personnel Report
10. Old Business
    a. Town Government Communications
    b. SHS Energy in the Environment - Unit 2, Energy Flow from Earth's Systems - NEW - Second Reading
    c. SHS Accelerated General Chemistry - Unit 1, Illuminating Matter - NEW - Second Reading
    d. SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACC - Revised - Second Reading
    e. SHS Earth Science - Unit 2, Climate Change and Human Impact ACC - NEW - Second Reading
    f. SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACA - Revised - Second Reading
    g. SHS History - Current Issues - Revised - Second Reading

h. SHS History - American Culture - Revised - Second Reading

11. New Business
    a. Review Policy 1112.7 - Recording Meetings without Consent - NEW - First Reading
    b. Review Policy 5131.3 - Managing Instructional Screen Time - NEW - First Reading
    c. Review Policy 5141.3 - Health Assessments and Immunizations - Revised - First Reading
    d. Review Policy 9271 - Code of Ethics - Revised - First Reading
    e. Review Policy 9321 - Time, Place, Notification of Meetings - Revised - First Reading
    f. Approval of Job Descriptions
        1. Food Services Operations Manager - NEW
        2. Family Resource Center of Southington Parent Educator - Revised
    g. Capital Improvement Plan 2027-2028 to 2031-2032 - First Reading
    h. Acceptance of SHS Solar Project Completion (DAS 131-0131 PV)
    i. Approval of the OT/PT Contract between UPSEU and the Board of Education.
12. Public Communications
    a. Public
13. Adjournment

The minutes presented within the document provide a summary of the discussion that took place at the Board of Education meeting. For the complete discussion of the agenda items, please view the video of the Board meeting on our website at https://www.southingtonschools.org. These minutes are considered a draft until approved at the following regular Board of Education Meeting.

SOUTHINGTON BOARD OF EDUCATION, SOUTHINGTON, CT
Regular Meeting
Committee of the Whole
October 29, 2026, at 6:30 p.m.
John Weichsel Municipal Center Public Assembly Room
200 North Main Street Southington, CT 06489

1. **CALL TO ORDER**
   Mr. Oshana, Board Chairperson, called the meeting to order at 6:30 p.m.
   Board Members Present: Mr. Robert Brown, Ms. Lisa Cammuso, Mrs. Terri Carmody, Mr. Sean Carson, Mrs. Colleen Clark, Mrs. Dawn Derynoski-Anastasio, Mr. Zaya Oshana
   Board Members Absent: Mr. Joseph Baczewski, Mr. Cecil Whitehead

2. **Executive Session**
   MOTION made by Ms. Cammuso and seconded by Mrs. Derynoski-Anastasio, "Move to go into Executive Session, excluding the public and the press, for the purpose of discussing Student Matters; upon conclusion reconvene to public session. Inviting Mr. Madancy and Mr. Pepe." Motion carried 7-0.
   Mr. Baczewski arrived right after the motion had been made at 6:30 p.m.
   a. Student Matters
      Executive session concluded at 6:53p.m.

3. **Reconvene Meeting - Regular Session 7:00 p.m.**
   Mr. Oshana called the regular meeting to order at 7:00 p.m.
   Board Members Present: Mr. Joseph Baczewski, Mr. Robert Brown, Ms. Lisa Cammuso, Mrs. Terri Carmody, Mr. Sean Carson, Mrs. Colleen Clark, Mrs. Dawn Derynoski-Anastasio, Mr. Zaya Oshana
   Board Members Absent: Mr. Cecil Whitehead
   Cabinet Members Present: Mr. Steven Madancy, Superintendent; Mr. Frank Pepe, Assistant Superintendent; Mrs. Amy Aresco, Pupil Services Director
   Student Board Representatives Present: Mr. Murad Alkatib, Miss Alexa Nowakowski, Miss Arshi Roy

4. **Pledge of Allegiance**

5. **Approval of Minutes - October 15, 2026**
   MOTION made by Mrs. Carmody and seconded by Ms. Cammuso, "Move to approve the BOE Minutes for October 15, 2026." Motion carried 6-2.

Mrs. Clark raised a concern about the use of the phrase "member tardy" in the attached Policy Committee minutes; questioned when this practice began and felt the wording was unnecessary and somewhat inappropriate when referring to volunteer board members. Mr. Oshana acknowledged the concern; he indicated that he would look into it and the wording could be reviewed and adjusted.

6. Public Communications

a. Communications from Student Board Representative

Miss Roy gave the High School Report:

- Today is the last day of the quarter, and students are preparing for report cards.
- The Homecoming dance is next Friday, November 6, 2026.
- The Women's Empowerment Club hosted a "Wear Pink" event to promote awareness and student involvement.
- FBLA hosted a Halloween party for younger children with activities in the cafeteria.
- DECA will attend a leadership conference next week.
- Students in African American/Black/Puerto Rican/Latino Studies, and Asian Studies programs participated in an educational field trip to the Yale Art Gallery
- Fall National Honor Society and World Language Honor Society induction ceremonies took place this week.
- Interact Club is working with high schoolers Katia Betros, McKenna Zimmer, and Isabella Vinci to organize a schoolwide food drive in two weeks. Inspired by last year's America 250 idea, the drive will include a grade-level competition to collect 250 items.
- Parent-teacher conferences for middle and high school are scheduled for November 12, 2026.
- The Veterans Concert is scheduled for Tuesday, November 10, 2026.
- The Ninth-Grade Academy, Agricultural Science, and Project Lead the Way programs are visiting middle schools to introduce eighth graders to high school opportunities.
- The tennis courts are now open.
- The Intentional Acts of Kindness Committee is collaborating with the Good Samaritan Club to promote kindness throughout the school.
- Music of the Night took place on Saturday and was a great success with many bands around the state with a high turnout. The band was phenomenal.
- SHS counselors hosted a first-generation college planning workshop that was well attended by students and families. This workshop was a working session, productive for families, and well received.
- Mr. Gleba and Mrs. Perry, two of SHS's counselors, have been coordinating guest speakers who represent a variety of educational and professional

backgrounds, with an emphasis on opportunities beyond the traditional four-year college route. So far students have been able to attend speakers on Construction Education Center and Pilot Training. Upcoming events are Union Carpenter, Universal Technical Institute, Aircraft Mechanic, Plumber, HVAC, and Electrical. These have been well attended by school.

Miss Nowakowski gave the District Report:

- The South End PTO sponsored Fun Run brought students together for a colorful, fun-filled event. Parent volunteers made the day possible by handling all volunteer responsibilities, while teachers generously donated their time for special raffle prizes. Thank you to our PTO, parents, and teachers for working together to create a memorable experience for our students.
- At Thalberg, the PTO recently hosted their Trunk or Treat event ahead of Halloween. Students and families got into the Halloween spirit and had an opportunity to trick or treat through over 15 cars that were decorated for the event. Additionally, we honored Mrs. Katie Reeves, the former Thalberg principal by hosting a PINK OUT with a Hawaiian Flair spirit day. As a school we raised over $800 that will be sent to Dana Farber Cancer Institute in her name.
- At JFK, every month, students are recognized for demonstrating Eagle Excellence. Teachers nominate students based on the school's mascot, the Eagle. for Engagement, Ambition, Grit, Leadership and Empathy. Nominated students are invited to a bagel breakfast with their families once a month. This month, 7th graders were recognized.
- On Friday, students that wish to dress up for Halloween are encouraged to bring in a box of cereal to be donated to the Southington Food Pantry. Giving to the community puts everyone in good spirits.
- Hats for Hope is November 6, 2026. For $1 or more, students may wear a hat to school to show their support for the Tommy Fund. For over 72 years, the Tommy Fund has supported pediatric cancer patients and their families within the Yale New Haven Hospital system.
- Teachers will send an invitation to families on November 6, 2026, for the upcoming fall conferences.
- At DePaolo, the sports teams just wrapped up their fall season this week with the exception of cross-country students that qualified for the State meet which will be held next Saturday in Manchester.
- Unity Day was October 21, 2026. Unity Day is a national movement to bring people together against bullying and promote Kindness, Acceptance and Inclusion. Students and staff at DePaolo wore orange that day to express their support.

- On October 22, 2026, many members of the DePaolo community came together for the annual Light-A-Pumpkin event. Students participated in a variety of activities including a pumpkin carving contest.
- Students from DePaolo were well represented at the Red Ribbon Rally on the Town Green last Tuesday.
- Students at DePaolo in the Leadership Program were busy assisting at the Fire Department Open House last Saturday held at Station 3.

Mr. Alkatib gave the Sports Report:

- As the fall sports season comes to a close, nearly all of our teams have qualified for state tournaments.
- Both boys' and girls' soccer teams have secured spots in the state tournament.
- Our girls' volleyball team is currently ranked in the top 10 in the state, while taking home the CCC Divisional Championship.
- Our girls' swim team made history this season, winning the CCC Divisional Championship for the first time since 2005. They'll now be heading to the State Championship.
- Our boys' and girls' cross-country teams also had outstanding seasons, both earning divisional titles. The boys went on to take first place at the CCC Cross Country Championships.
- Our cheerleading team came in first place and named grand champion at their fall game day competition at Southern CT State University. Cheerleading Coach Jim McAloon was recognized by his fellow coaches as CCC Coach of the Year.
- Our football team continues its undefeated season and is currently ranked number one in the Class LL state playoff rankings.

Mr. Baczewski asked about the Thalberg fundraiser and expressed interest in matching the school's donation to Dana-Farber. He also encouraged the student representatives to bring up any topics they felt the Board could help improve the students' experience.

Mr. Carson asked where the DECA leadership conference would be held; it was confirmed it would take place at the Aqua Turf.

b. <u>Communications from Board of Education</u>

Mr. Brown reminded the public of the upcoming Wall of Honor 20th celebration. This year's inductees, along with all past honorees, will be invited to the Aqua Turf for a dinner on December 8, 2026. This year's inductees are:

- Mark Ramsay – involved with Lewis Farms and the LEAF Program.
- James Benn – an author of 23 publicized books.

- Austin Florian – an Olympian and inspirational speaker.
- Joe Della Porta- active in town, a veteran, and a volunteer.
- Donald Dorman – a WWII veteran.

Mr. Brown encouraged educators and members of the public to purchase tickets and attend the celebration. He noted that ticket sales were still low and emphasized the importance of recognizing the accomplishments of these individuals.

Mr. Brown encouraged residents to gather as much information as possible before voting in the elementary school referendum. He emphasized two considerations:

- What is best for the majority of students?
- How can taxpayer dollars be used as effectively and efficiently as possible?

He encouraged everyone to vote regardless of their position on the referendum.

Ms. Cammuso praised the Music of the Night event, commenting on how well it was organized and how impressive the performances were. She specifically recognized the University of New Haven band and the overall success of the event.

c. Communications from Administration

Mr. Madancy spoke on the following topics:

Music of the Knight:

Thank you to the parents and band boosters who organized and coordinated Music of the Night. He emphasized that much of the event's success comes from the parents who volunteer their time throughout the day.

He also noted that this year's event was the largest band competition in Connecticut, even larger than the state competition, and praised the improved parking and traffic flow that helped accommodate the participating bands and buses.

2027-2028 Budget Preparation:

The district has begun its budget preparation process.

- Initial meetings were held with elementary school principals and the curriculum office.
- Additional meetings were scheduled with the remaining elementary principals, high school administrators, central office staff, and special education department.

The Superintendent explained that the upcoming budget will be challenging because the district received one-time supplemental funding from the governor that was not included in the district's ongoing operating budget.

He also discussed the importance of the Blue-Ribbon Commission on Education Cost Sharing. If the commission makes recommendations that could provide financial relief to local communities, he suggested that the Board consider sending a letter to state legislators supporting those recommendations.

Teacher Convocation and Professional Development:
The district will hold its teacher convocation on Tuesday at 8:00 a.m. at the high school, followed by professional development sessions. Mr. Madancy explained that moving convocation to Election Day has worked well because it gives teachers additional time at the beginning of the school year to prepare their classrooms and meet students and families. He praised the professional development committee for organizing sessions that allow teachers to choose opportunities based on their individual interests and needs.

Special Education Coordinator Position:
The district received 64 applications for the Special Education Coordinator position. Interviews are scheduled to begin next week. Cathy Goralski is retiring in December, and the district will begin the process of selecting her replacement.

Mrs. Mellitt is not at this meeting because she is celebrating Nicole Maxellon, Food Service Director, who is being recognized as a Rising Star in the food service directors' group.

Mr. Oshana clarified the impact of the district's $834,000 one-time supplemental funding from the state. The district's approved budget was $834,000 lower than originally anticipated because the funding was removed from the operating budget during the budget process. The district subsequently received the $834,000, but it was not added to the permanent operating budget.

d. Communications from Public - Agenda Items Only
No comment made.

7. Committee Reports

a. Curriculum & Instruction Committee Meeting - October 21, 2026
Mr. Brown reviewed the minutes of the meeting. He gave a summary of the following items:

- SHS Physical Education - Unit 2, Recreational Lifetime Activities– Revised Curriculum
- SHS English - Novel Proposal
- SHS Energy in the Environment - Unit 2, Energy Flow from Earth's Systems – New Curriculum
- SHS Accelerated General Chemistry - Unit 1, Illuminating Matter – New Curriculum
- SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACC and SHS Earth Science – Unit 4, Astronomy - Guest Stars and the Big Bang ACA – Revised Curriculum
- SHS Earth Science – Unit 2, Climate Change and Human Impact ACC – New Curriculum

- SHS Social Studies - Current Issues – Revised Curriculum
- SHS Social Studies - American Culture - Revised Curriculum
- SHS Social Studies - Criminal Justice CLC - Textbook Overview
- SHS New Course Enrollment

The minutes for the meeting are attached.

Mrs. Carmody thanked Mrs. Zlatin for providing the new course enrollment information. She also spoke about how proud she is of our teachers for providing students with curriculum that will help them compete in the world and this economy today.

Mr. Baczewski and Mrs. Clark reiterate how important it is to have our students learning how to go through information; understanding the emotional aspect, the statics behind it and everything in between. It is awesome to see the teachers staying up with and ahead of the times and with curriculum being relevant to current events.

8. Old Business

a. Town Government Communications
No comment made.

b. Review Policy 3542.1 - Purposes and Facilities - Food Service - Revised - Second Reading
MOTION made by Mrs. Derynoski-Anastasio and seconded by Mr. Baczewski, Move that the Board of Education approve Policy 3542.1 – Purposes and Facilities - Food Service as presented by the Policy & Personnel Committee." Motion carried 8-0.

c. Review Policy 4215 - Emergency Action Plan for Athletic Events - NEW - Second Reading
MOTION made by Mrs. Derynoski-Anastasio and seconded by Mr. Baczewski, "Move that the Board of Education approve Policy 4215 – Emergency Action Plan for Athletic Events as presented by the Policy & Personnel Committee." Motion carried 8-0

d. Review Policy 5114 - Student Discipline - Revised - Second Reading
MOTION made by Mrs. Derynoski-Anastasio and seconded by Mr. Baczewski, "Move that the Board of Education approve Policy 5114 – Student Discipline – Revised as presented by the Policy & Personnel Committee." Motion carried 8-0.

e. Review Policy 5123 - Promotion and Retention - Revised - Second Reading
MOTION made by Mrs. Derynoski-Anastasio and seconded by Mr. Baczewski, "Move that the Board of Education approve Policy 5123 – Promotion and Retention – Revised as presented by the Policy & Personnel Committee." Motion carried 8-0.

f. Review Policy 5141.8 - Students with Special Health Care Needs - NEW - Second Reading
MOTION made by Mrs. Derynoski-Anastasio and seconded by Mr. Baczewski, "Move that the Board of Education approve Policy 5141.8 – Student with Special Health Care Needs as presented by the Policy & Personnel Committee." Motion carried 8-0.

9. New Business

a. SHS Physical Education - Unit 2, Recreational Lifetime Activities - Revised - First Reading

b. SHS Energy in the Environment - Unit 2, Energy Flow from Earth's Systems - NEW - First Reading

c. SHS Accelerated General Chemistry - Unit 1, Illuminating Matter - NEW - First Reading

d. SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACC - Revised - First Reading

e. SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACA - Revised - First Reading

f. SHS Earth Science - Unit 2, Climate Change and Human Impact ACC - NEW - First Reading

g. SHS History - Current Issues - Revised - First Reading

h. SHS History - American Culture - Revised - First Reading

i. District Data Presentation
Christina Zlatin, Director of Teaching and Learning, presented the district's continuous improvement data, focusing primarily on student achievement and growth in grades 3–8. She was joined by: Stephanie Lawlor, K–8 Literacy and K–5 Social Studies Coordinator and Alicia Naleway, K–8 Math and K–5 Science Coordinator. The presentation was organized around Connecticut's Next Generation

Accountability System, which uses 12 indicators to evaluate how schools and districts prepare students for college, careers, and life.

The presentation focused on academic achievement in literacy, math, and science and academic growth in literacy, math, and English proficiency. They spoke about the outcome and the work that has supported the outcomes over the last year, along with the next steps as they continue on.

The district's average was higher than the state average in all sections.

	District Average	State Average
SBA Literacy	68%	51%
SBA Math	67.4%	46.7%
NGSS Assessment	69.8%	51.4%

Topic discussed included:

- SBA Literacy: Achievement Overview
- SBA Literacy: Score Distribution
- K-2 Reading -DIBELS Ed of Year Benchmark
- K-12 LAS Links Literacy – District Growth, LAS Links Assessment
- SBA: Achievement Overview
- SBA Math: Score Distribution
- SBA Math: Achievement Trend- all students and high needs students
- SBA Math Growth Trend
- NGSS Assessment: Achievement Overview
- NGSS Assessment: Score Distribution
- NGSS Assessment: Achievement Trend - all students and high needs students
- Continuous Improvement Strategies
- DRG C Comparison, Science
- DRG C Comparison, Math
- DRG C Comparison, Literacy

Achievement gaps remain an area of focus. The administration discussed continued efforts to improve outcomes for high-needs students and multilingual learners.

Additional student achievement data will be provided to the Board, including non-high-needs student results, pre-pandemic literacy growth comparisons, and additional multilingual learner information.

Mr. Madancy explained that student achievement is influenced by several factors, including:

- Available financial resources.

- Class sizes.
- Access to intervention teachers.
- Special education caseloads.
- Students' socioeconomic backgrounds.
- Students' background knowledge and experiences

Members emphasized the importance of considering other measures, including:

- Classroom assessments.
- Curriculum-based assessments.
- Benchmark assessments throughout the year.
- Student growth over time.
- The accomplishments and character of students after graduation.

The Board also discussed the importance of not allowing standardized testing to dictate classroom instruction or encouraging excessive test preparation at the expense of meaningful learning.

The overall discussion recognized that the district's improving results are encouraging, while emphasizing that achievement data should be considered in the broader context of student learning and success.

The power point presentation is attached.

j. Adoption of 2027 Board of Education Meeting Dates
MOTION made by Mr. Baczewski and seconded by Ms. Cammuso, "Move to approve the adoption of 2027 Board of Education Meeting Dates." Motion carried 8-0.

10. Public Communications

a. Public
No comment made.

11. Adjournment

MOTION made by Mrs. Clark and seconded by Mr. Baczewski, "Move to adjourn." Motion carried 8-0.
Meeting adjourned at 7:58 p.m.

Respectfully submitted,

Jackie Yadeau

Recording Secretary

SOUTHINGTON Public Schools

Steven G. Madancy
Superintendent of Schools

Frank M. Pepe
Assistant Superintendent of Schools

200 North Main Street, Southington, CT 06489 ❖ www.southingtonschools.org ❖ Phone: 860-628-3202 ❖ Fax: 860-628-3205

Southington Board of Education
Curriculum & Instruction Committee Meeting Minutes
Wednesday October 21, 2026 – 1:00 p.m.
Technology Training Lab (Public Assembly Room)
Municipal Center, 200 North Main Street
Southington, CT 06489

Members Present: Bob Brown, Terri Carmody, Colleen Clark, Dawn Anastasio.

Member Absent: N/A

Administration Present: Director of Teaching and Learning, Dr. Christina Zlatin.

School Staff Present: SHS Health and PE Department Leader, Tony Loomis; SHS English Department Leader, Rebecca Migliaro; SHS Science Assistant Department Leader, Dr. Lisa Daigle; SHS Science Department Leader, Nicole Raccio; SHS Social Studies Department Leader, Heather Allenback.

The meeting was called to order at 12:57 PM by Bob Brown.

SHS Physical Education - Unit 2, Recreational Lifetime Activities– Revised Curriculum
Tony Loomis, SHS Health and PE Department Leader, presented the new outdoor archery component of the Recreational Lifetime Activities unit for PE II. The addition of outdoor archery supports the department's vision, mission, and beliefs; helps students develop movement identities; and aligns to national standards. The unit emphasizes safety practices in instruction and assessment, including first teaching whistle commands without equipment. Teachers implementing outdoor archery must be trained through the National Archery in the Schools Program. Students have a choice to learn archery, and teachers must approve students who select this option. Equipment is designed specifically for schools. The Committee unanimously agreed to forward this item to the full Board for review.

SHS English - Novel Proposal
Rebecca Migliaro, SHS English Department Leader, shared as an informational item a new required text, *Everyday* by David Levithan, for the 12th grade Humanities elective course. The plot follows an individual who wakes up in a different person's body each day. It directly supports course themes such as what makes us human and includes topics such as substance abuse but has no graphic content. Families of students in the Humanities course will receive communication about the text.

SHS Energy in the Environment - Unit 2, Energy Flow from Earth's Systems – New Curriculum
Dr. Lisa Daigle, SHS Science Assistant Department Leader, presented a new unit for the one-semester course, Energy in the Environment. The unit uses a recent national event, the Texas power crisis of 2021, as a phenomenon to guide students learning about energy. Students learn through simulations, data analysis, and models as they develop arguments and solutions to real-world problems. The Committee unanimously agreed to forward this item to the full Board for review.

Board of Education
Zaya Oshana, *Board Chairperson* – Terri Carmody, *Vice Chairperson* – Dawn Derynoski-Anastasio, *Secretary*
Joseph Baczewski – Robert Brown – Lisa Cammuso – Sean Carson – Colleen Clark – Cecil Whitehead

SOUTHINGTON Public Schools

Steven G. Madancy
Superintendent of Schools

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SHS Accelerated General Chemistry - Unit 1, Illuminating Matter – New Curriculum

Dr. Lisa Daigle, SHS Science Assistant Department Leader, presented a new chemistry unit in which students study the lightbulb to understand fundamental concepts in chemistry, including the structure and properties of matter, periodic trends, and wave properties. Through their study, students learn how light bulbs produce light, how different types of bulbs produce different colors of light, and how properties of matter make some elements good for light bulbs. The Committee unanimously agreed to forward this item to the full Board for review.

SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACC – Revised Curriculum
SHS Earth Science – Unit 4, Astronomy - Guest Stars and the Big Bang ACA – Revised Curriculum

Nicole Raccio, SHS Science Department Leader, presented a revised unit for the 9th grade Earth Science course, academic and accelerated levels. The unit integrates earth science and physical science standards as students study the phenomenon of the guest star, a star that has been in the sky and then disappears. Students use this phenomenon to develop understandings of the properties of light as well as matter and forces within stars. Students in the accelerated course extend their learning to study how the universe is changing. The Committee unanimously agreed to forward this item to the full Board for review.

SHS Earth Science – Unit 2, Climate Change and Human Impact ACC – New Curriculum

Nicole Raccio, SHS Science Department Leader, presented a new Earth Science unit that uses the phenomenon of rising sea levels to deepen students' understanding of climate change. Students explore evidence of rising sea levels, develop an understanding of the cause, and evaluate potential solutions to slow polar ice melt. There are opportunities for students to apply their learning on performance tasks throughout the unit. The Committee unanimously agreed to forward this item to the full Board for review.

SHS Social Studies - Current Issues - Revised

Heather Allenback, SHS Social Studies Department Leader, presented a revised curriculum for the one-semester course, Current Issues. Throughout the course, there is an emphasis on evaluating information, recognizing bias, and participating responsibly in civic life. All students participate in two core units, and three additional units are selected by each class from the following options: "Artificial Intelligence & Creativity"; "Bridging the Gap: Income Inequality in the US"; "Climate in Crisis"; "Displaced Dreams: Refugees"; "Hot Spots: Political Issues of the 21st Century"; "Mind Matters: Mental Health & Social Media"; "Safeguarding Society: Navigating Public Safety"; "The State of Education"; and "Who Owns Culture?" The Committee unanimously agreed to forward this item to the full Board for review.

SHS Social Studies - American Culture - Revised Curriculum

Heather Allenback, SHS Social Studies Department Leader, presented a revised curriculum for American Culture. The course teaches US history from the 1950s through the first quarter of the 21st century, through the lens of US culture and identity. Students use historical sources and materials from popular culture to understand who we are, what we value, and how Americans understand their place in society. The Committee unanimously agreed to forward this item to the full Board for review.

SHS Social Studies - Criminal Justice CLC - Textbook Overview

Heather Allenback, SHS Social Studies Department Leader, presented as an informational item a free, online, open-source textbook to support a new concurrent enrollment Criminal Justice course offered in partnership with the University of Bridgeport. The text is: R. Supplee, et al. *Introduction to the American Criminal Justice System: An Equity Lens*. Open Oregon Educational Resources, 2025. This is a college-level textbook and selected chapters are used in the course. The textbook was previously approved by Mr. Madancy.

Board of Education
Zaya Oshana, *Board Chairperson* – Terri Carmody, *Vice Chairperson* – Dawn Derynoski-Anastasio, *Secretary*
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SOUTHINGTON Public Schools

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SHS New Course Enrollment

Dr. Christina Zlatin, Director of Teaching and Learning, presented as an informational item an overview of course enrollment for new SHS courses approved since 2023-2024. Committee members posed questions about the implementation timeline, vendor, enrollment cap, and funding for the Emergency Medical Technician course; this information will be provided in follow-up communication.

The meeting adjourned at 2:25 PM.

Respectfully Submitted,

Christina L. Zlatin, Ed.D.
Director Of Teaching and Learning

Board of Education
Zaya Oshana, *Board Chairperson* – Terri Carmody, *Vice Chairperson* – Dawn Derynoski-Anastasio, *Secretary*
Joseph Baczewski – Robert Brown – Lisa Cammuso – Sean Carson – Colleen Clark – Cecil Whitehead

Summary of Special Board Meeting – November 4, 2026

Date: November 4, 2026

Board Members present:

Bob Brown
Terri C. Carmody
Dawn Derynoski-Anastasio

Approximately 2:34 p.m.	Meeting called to order.

Approximately 2:34 p.m.

Motion to go into executive session made by B. Brown, seconded by D. Derynoski-Anastasio.

Moved that the Board enter executive session to discuss a confidential student matter.

The following individuals were invited into executive session:

Steven Madancy, Superintendent of Schools
Frank Pepe, Assistant Superintendent of Schools
Richard Aroian, Principal, Southington High School
Simone Crouch, Assistant Principal, Southington High School
Mark Sommaruga, Attorney for the Administration
Julia Wilde, Counsel for the Board
Parent
Grandmother
Grandfather
Student

Approved 3 - 0.

Approximately 3:05 p.m.	The Board, and Board Counsel, excused themselves for deliberations.
Approximately 3:13 p.m.	Meeting resumes. All meeting participants present return.

T. Carmody makes the following motion in open session at approximately 3:13 p.m.:

Moved: That the Southington Board of Education finds, based on the evidence in the record, that the student who is the subject of this hearing did, on October 19, 2026, strike or assault a student and acted

in a manner that endangered persons and significantly disrupted the learning environment, which violated publicized policy of the Board and was seriously disruptive of the educational process and endangered persons or property. As a result of the above findings, the Southington Board of Education concludes that the Student who is the subject of this hearing did commit an expellable offense.

B. Brown seconded.

Motion Approved 3 - 0.

Approximately 3:14 p.m.

Motion to go into executive session made by D. Derynoaki-Anastasio, seconded by B. Brown.

Moved that the Board enter executive session to discuss a confidential student matter.

The following individuals were invited into executive session:

Steven Madancy, Superintendent of Schools
Frank Pepe, Assistant Superintendent of Schools
Richard Aroian, Principal, Southington High School
Simone Crouch, Assistant Principal, Southington High School
Mark Sommaruga, Attorney for the Administration
Julia Wilde, Counsel for the Board
Parent
Grandmother
Grandfather
Student

Approved 3 - 0.

Approximately 3:28 p.m. The Board, and Board Counsel, excused themselves for deliberations.

Approximately 4:08 p.m. Meeting resumes. All meeting participants present return.

Approximately 4:10 p.m. B. Brown made the following motion in open session.

Moved Further:

That the student who is the subject of this hearing shall be expelled from the Southington Public Schools for one year until October 19, 2027.

During the period of expulsion, the student shall not be permitted to be on school grounds and/or participate in any school sponsored events and activities, except as expressly authorized in writing by the Superintendent or the Superintendent's designee.

During the expulsion period the student shall be provided with an alternative educational program consisting of a minimum of 10 hours of individual instruction per week, as determined by the administration.

Under the following conditions, The Student may be permitted early readmission to school on a probationary basis for the remainder of the calendar year after 60 school days on February 1, 2027 if the Superintendent finds in the Superintendent's sole discretion that the student has met the following conditions:

1. **Excellent attendance in the alternative program and continue with 95% attendance if readmitted early.**
2. **Substantial academic progress in the alternative program and continued if reentry is earned, demonstrating passing grades in all subjects.**
3. **Submit documentation of 25 hours of community service during the second, 3rd and 4th quarters of the 2026-27 school year and 25 hours of community service during the summer of 2027.**
4. **Meet monthly during the probationary period with the assistant principal, school counselor and/or other professional staff to review status and progress.**
5. **Submit evidence of ongoing counseling related to emotional regulation for the full 180 days.**
6. **No further violations of Board policy or state and federal laws.**

T. Carmody seconded.

Motion Approved 3-0.

At approximately 4:12 p.m. B. Brown made the following motion:

Moved Further:

That the Superintendent of Schools be authorized to issue a written decision on behalf of the Board committee consistent with this motion setting forth the basis for the committee's determination in this matter.

T. Carmody seconded.

Motion Approved 3-0.

At approximately 4:13 p.m. B. Brown moved to adjourn the meeting, seconded by T. Carmody.

Motion approved 3-0 and meeting adjourned.

Board of Education

Administrative Report

November 19, 2026

1. Budget Meetings
2. Rotary Club of Southington donated Journals/Pencil Pouches to each 3rd grade student in district.
3. Veterans, Thanksgiving Mats
4. Veterans Day Activities
5. Transportation Information Forms

SOUTHINGTON Public Schools

Steven G. Madancy
Superintendent of Schools

Frank M. Pepe
Assistant Superintendent of Schools

200 North Main Street, Southington, CT 06489 www.southingtonschools.org Phone: 860-628-3202 Fax: 860-628-3205

Board of Education Southington, Connecticut

Policy & Personnel Committee Meeting

DRAFT Minutes

Superintendent's Conference Room
Municipal Center, 200 North Main Street

Tuesday, November 10, 2026 - 5:30pm

Members Present: Dawn Derynoski-Anastasio (Chair), Joe Basczewski, Bob Brown, Cecil Whitehead

Additional BOE Member Present: Board Chairman Zaya Oshana

Administration Present: Assistant Superintendent - Frank Pepe, HR Manager - Michelle Passamano, Director of Business & Finance – Jennifer Mellitt

The meeting was called to order at 5:30 pm.

Renumbering of Policies/Regulations of the 4000 Series was discussed. Renumbering will accurately align the series as it continues to be overhauled in large chunks. This work also has led to the reduction of some 4000 policies and regulations due to redundancy.

A new job description for a **Food Services Operations Manager** was presented. The position will be fully funded by the Food Services Department budget, and no funds will be used from the district's operating budget. This position was originally part of the Financial Plan that is submitted to the State of Connecticut each year as a district chef. However, due to new programs such as Farm to School coming to the forefront, the position was revised as an Operations Manager to not limit the applicant's time to the kitchen.

An updated job description for **Family Resource Center of Southington Parent Educator** was reviewed per district practice when a retirement occurs. The review of the role yielded only three minor clarifying language changes.

Policy 1112.7- Recording Meetings without Consent was presented as new. As stated within the policy, it is intended to prevent the unauthorized recording of private professional interactions, confidential student matters, and internal administrative consultations. It is not intended to prohibit recording in public or semi-public forums where there is no expectation of privacy.

Policy 5131.3 - Managing Instructional Screen Time was presented as a new policy and is meant to compliment the student personal device usage guidelines. The administration will develop an associated set of regulations if this policy passes the full Board.

200 North Main Street, Southington, CT 06489 www.southingtonschools.org Phone: 860-628-3202 Fax: 860-628-3205

Revisions to **Policy 5141.3 – Health Assessments and Immunizations** were reviewed. The modification clarified religious exemptions grandfathered in prior to being awarded on April 28, 2021.

Revisions to **Policy 9321 – Time, Place, Notification of Meetings** were proposed to reflect that no meetings of the full Board are held in the month of July.

Revisions to **Policy 9271 – Code of Ethics** were reviewed. The numbering of ethics on the second page was corrected. Discussion ensued surrounding number 17 and that complaints submitted to the Board should be handled through the proper chain of command. This led to a discussion around BOE members speaking publicly or privately using their citizen voice versus a voice representing a Board member. Board members are one of nine, and the Board speaks with one voice. An example was offered using the concept of a motion ending in 5 to 4 vote. Once the motion passes, all nine members are charged with supporting the motion as passed regardless of an individual position prior to the vote.

The committee was introduced to CABE's model policy – **Communications with the Public (1110)** and Cheshire Public School's policy - **Public Statements (9020)** as samples for consideration**.** No changes were suggested although a "Who to Call" chart was offered for consideration.

The Committee agreed to forward all the agenda items above for full BOE review and further consideration.

Meeting adjourned – 6:13 p.m.

Respectfully Submitted,

Frank Pepe

DRAFT

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only_____ Board Meeting Date November 19, 2026

Decision Requested X Agenda Code 9 a

AGENDA REPORTING FORM

Agenda Topic: Personnel Report

Summary of Issue: This Personnel Report includes appointments, resignations, retirements, and transfers for certified and classified personnel for the 2026-2027 school year. The report also provides a monthly summary of district staffing levels, including the district's full-time equivalent (FTE) count and any variances in FTE from the previous reporting period. This report reflects personnel activity for the month of October 2026.

Background: The human resource department provides the Board of Education with a monthly update of personnel additions/reductions/changes.

Alternative Strategies:

Cost (if applicable): N/A **Funding Source:** Board of Education

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Recommend that the Board of Education approve the Personnel Report as submitted by the human resource department.

Michelle Passamano
Signature of Staff Member Submitting Report

Steven Madaras
Signature of Superintendent

Included:
Personnel Report

Personnel Report
October 2026

APPOINTMENTS

	NAME	POSITION	SCHOOL	FTE	EFFECTIVE	DEGREE	SALARY
CLASS	Byrne, Emma	Computer Technician	District	1.0	11-2-2026	N/A	$27.10
CLASS	Danese, Zoe	ABA Therapist, SLC	HES	1.0	11-9-2026	N/A	$21.28
CLASS	Dombal, Hunter	ABA Therapist, SLC	HES	1.0	11-2-2026	N/A	$21.28
CERT	Giroux, Adam	Special Education Teacher	FES	1.0	10-19-2026	BA	$59,079
CLASS	Greene, Michael	Paraeducator	JAD	0.48	10-7-2026	N/A	$22.19
CLASS	Horton, Amy	Literacy/Numeracy Tutor	HES	1.0	10-26-2026	N/A	$25.00
CLASS	Kassel, Cassandra	Administrative Assistant	CO	1.0	11-2-2026	N/A	$27.28
CLASS	Lacomb, Katrina	Paraeducator, CLC	HES	1.0	11-2-2026	N/A	$24.04
CLASS	Medeiros, Megan	Paraeducator	SEES	1.0	10-13-2026	N/A	$19.43
CLASS	O'Connor, Emily	ABA Therapist	SES	1.0	10-13-2026	N/A	$22.19
CERT	Pasquariello, Krystyna	Special Ed. Coordinator	District	1.0	1-4-2027	6th	$150,534
CLASS	Pompei, Alison	Literacy/Numeracy Tutor	FES	1.0	10-13-2026	N/A	$25.00
CLASS	Rivera, Gioconda	Administrative Assistant	SHS	1.0	11-16-2026	N/A	$28.54
CLASS	Serrano, Emmanuel	Paraeducator	SES	0.88	11-9-2026	N/A	$19.43
CLASS	Stewart, Angela	Paraeducator, CLC	HES	1.0	10-19-2026	N/A	$21.28
CLASS	Wesley, Clinton	Crossing Guard	DES	1.0	10-19-2026	N/A	$21.08
CLASS	Zmijewski, Maria	Physical Therapist	District	0.5	11-12-2026	MA	$38,044

RESIGNATIONS/RETIREMENTS

	NAME	POSITION	SCHOOL	EFFECTIVE	YRS	RET/RES
CLASS	Dubowsky, Thomas	Custodian, PT	SHS	10-24-2026	2	RESIGN
CLASS	Horton, Amy	Paraeducator, PT	HES	10-25-2026	3	RESIGN
CLASS	Kataja, Ashley	Literacy/Numeracy Tutor	HES	10-16-2026	7	RESIGN
CLASS	Pahl, Nancy	Crossing Guard	KES	6-30-2027	4	RETIRE
CLASS	Porteus, Lisa	FRC Parent Educator	District	12-24-2026	4	RESIGN
CLASS	Varley, Rachel	Paraeducator, FT	FES	10-31-2026	1	RESIGN

ASSIGNMENT CHANGE

	FROM (PREVIOUS ASSIGN)		TO (NEW ASSIGN)		
NAME	POSITION/SCHOOL	FTE	POSITION/SCHOOL	FTE	EFFECTIVE
Cofrancesco, Barbara	Administrative Assistant/SHS	1.0	Administrative Assistant/JAD	1.0	10-14-2026

TRANSFERS

	FROM (PREVIOUS ASSIGN)		TO (NEW ASSIGN)		
CERT NAME	POSITION/SCHOOL	FTE	POSITION/SCHOOL	FTE	EFFECTIVE

None to report

LEAVES OF ABSENCE

NAME	POSITION/SCHOOL	DATES	LTS/COVERAGE
Boyd, Jennie	Grade 4/TES	1/4/2027 – 3/31/2027	Guy, Brooke
Brooks, Teresa	Business/SHS	10/27/2026 – 1/29/2027	Hilmy, Fathima Azra
Cole, Kristy	Kindergarten/SES	1/4/2027 – 6/9/2027	Dickson, Savannah

STIPENDS

COACHING

Resignations/Non-Renewals

None to report

Appointments

None to report

STIPENDS CONT.

OTHER

Resignations/Non-Renewals

None to report

Appointments

None to report

Personnel Report
October 2026

FULL-TIME EQUIVALENT (FTE) – STAFF COUNT

Month	Beginning FTE	Additions	Reductions	Grant Funded	Ending FTE	Notes
Jun-26	1,189.84	0.00	0.00	0.00	**1,189.84**	2025–2026 year-end FTE count; establishes baseline for 2026–2027 reporting.
Jul-26	1,189.84	0.00	(26.00)	0.00	**1,163.84**	Reduction of 26.0 FTE associated with 2026–2027 staffing reallocations.
Aug-26	1,163.84	3.00	0.00	0.00	**1,166.84**	3.0 FTE added to support newly enrolled students requiring adult/paraeducator support at SES and HES (8/25&9/1).
Sep-26	1,166.84	1.00	0.00	0.00	**1,167.84**	1.0 FTE added to support newly identified student requiring 1:1 paraeducator support at SEES (9/30/26).
Oct-26	1,167.84	1.76	0.00	0.00	**1,169.60**	1.76 FTEs added (two, 27.5 paraeducators) to support student moving into district that requires 1:1 support and two newly identified students (10/20/26).
Nov-26						
Dec-26						
Jan-27						
Feb-27						
27-Mar						
27-Apr						
27-May						
27-Jun						

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 10 b.

AGENDA REPORTING FORM

Agenda Topic: SHS Energy in the Environment - Unit 2, Energy Flow from Earth's Systems - NEW - Second Reading.

Summary of Issue: The Curriculum & Instruction Committee has reviewed the SHS Energy in the Environment - Unit 2, Energy Flow from Earth's Systems - NEW.

Background: _____

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

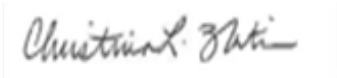
Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

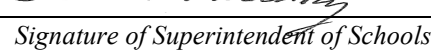
Recommendation or Comment: Move that the Board of Education approve the SHS Energy in the Environment - Unit 2, Energy Flow from Earth's Systems - NEW – as presented by the Curriculum & Instruction Committee.

Titles of Attachments:

1. Course Proposal



Signature of Staff Member Submitting Report



Signature of Superintendent of Schools

Unit Overview	
Unit Title:	Energy in the Environment: Unit 2 - *Energy Flow from Earth's Systems*
Teacher:	Kelsey Duffy
Grade Level/Course:	10-12 Energy in the Environment
Length/Dates:	12 weeks
Unit Summary:	How can we design more reliable systems to meet our communities' energy needs? This unit is designed to introduce students to the concept of energy transfer in a relevant and grounded context: the Texas power crisis of February 2021. Students read articles and wonder about the complex social, environmental, and physical realities that led to such a crisis. They figure out how energy transfers between systems from a generator to our communities, and what makes an energy source reliable. This allows the class to model and explain what happened in Texas at multiple scales, from the electrons in the wires to the power companies making difficult decisions to maintain stability. Students consider engineering tradeoffs, criteria, and constraints inherent in making decisions about our energy systems, and apply them in a culminating task: design a reliable energy solution that meets our communities' needs, as articulated by interviews with friends and family members. The task is designed to give students the tools to speak up in their local and global community for a better energy future, one that aligns with their own values, and those of their families. P.1: Energy Flow from Earth's Systems

Performance Expectations

This unit builds toward these performance expectations:

HS-PS3-2† Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (objects) and energy associated with the relative positions of particles (objects).
HS-PS3-3 Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
HS-PS3-1† Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
HS-ESS3-2† Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

HS-ETS1-3† Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
HS-ETS1-4 Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

*This performance expectation is developed across multiple units. This unit reinforces these NGSS PEs in a physics context.
†This performance expectation is developed across multiple courses. This unit reinforces or works toward these NGSS PEs that students will have previously developed in the OpenSciEd chemistry and/or biology courses.

Essential Questions:

1. How does electricity transfer through systems, and what causes instability in those systems?
2. What could cause unbalanced effects on communities that experience blackouts?
3. What design solutions could improve electricity systems in our communities?

Science and Engineering Practices (Skills)	Disciplinary Core Ideas (Knowledge)	Crosscutting Concepts (Enduring Understandings)
This unit **intentionally develops** students' engagement in these practice elements: **Asking questions and defining problems** in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations. The following elements of this practice are intentionally developed across this unit: ● Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.	**PS3.A: Definitions of Energy** ● Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. ● At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal	This unit **intentionally develops** students' engagement in these crosscutting concept elements: **Systems and System Models.** A *system* is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems. The following elements of this crosscutting concept are intentionally developed across this unit: ● Systems can be designed to do specific tasks. ● Models (e.g., physical, mathematical, and computer models) can be used to

Developing and using models in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds. The following elements of this practice are intentionally developed across this unit:

- Develop and use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.
- Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories. The following element of this practice is intentionally developed across this unit:

- Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and trade-off considerations.

energy.

- "Electrical energy" may mean energy stored in a battery or energy transmitted by electric currents. (secondary)
- These relationships are better understood at the microscopic scale, at which all of the different manifestations of energy can be modeled as a combination of energy associated with the motion of particles and energy associated with the configuration (relative position of the particles). In some cases the relative position energy can be thought of as stored in fields (which mediate interactions between particles). This last concept includes radiation, a phenomenon in which energy stored in fields moves across space.

PS3.B: Conservation of Energy and Energy Transfer

- Conservation of energy means that the total change of energy in any system is always equal to the total energy transferred into or out of the system.
- Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems.
- The availability of energy limits what can occur in any system.

PS3.D: Energy in Chemical Processes

- Although energy cannot be destroyed, it can be converted to less useful

simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Energy and Matter. Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior. The following elements of this crosscutting concept are intentionally developed across this unit:

- The total amount of energy and matter in closed systems is conserved.
- Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.
- Energy cannot be created or destroyed—only moves between one place and another place, between objects and/or fields, or between systems.

Elements from the following crosscutting concepts are also **key to the sensemaking** in this unit:

- Patterns
- Structure and Function
- Cause and Effect

	forms—for example, to thermal energy in the surrounding environment. **ESS3.A Natural Resources** ● All forms of energy production and other resource extraction have associated economic, social, environmental, and geopolitical costs and risks as well as benefits. New technologies and social regulations can change the balance of these factors. (HS-ESS3-2) **ETS1.A: Defining and Delimiting Engineering Problems** ● Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges may also have manifestations in local communities. (HS-ETS1-1) **ETS1.B: Developing Possible Solutions** ● When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts. (HS-ETS1-3) ● Both physical models and computers can be used in various ways to aid in the engineering design process. Computers are useful for a variety of purposes, such as running simulations to test different ways of solving a problem or to see which one is most	

	efficient or economical, and in making a persuasive presentation to a client about how a given design will meet their needs. (HS-ETS1-4)	

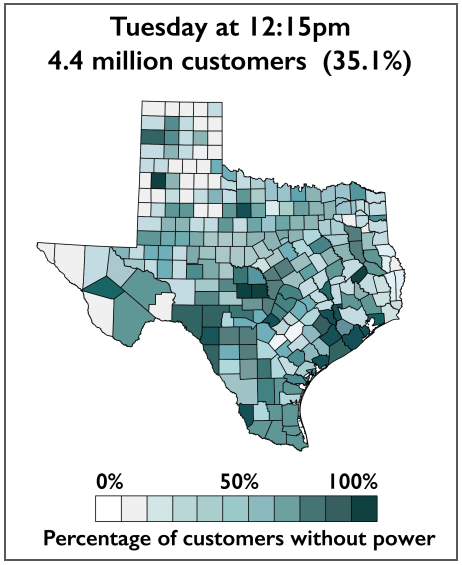
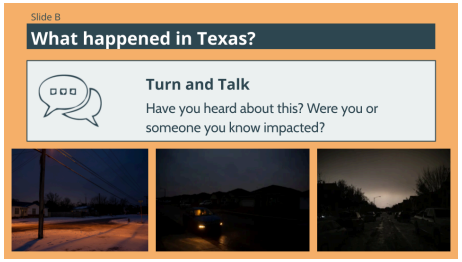
Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

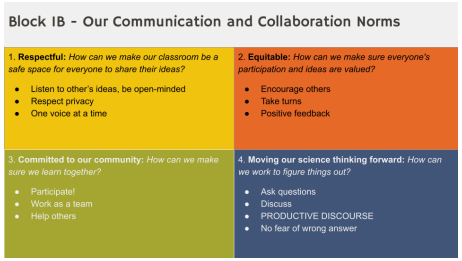
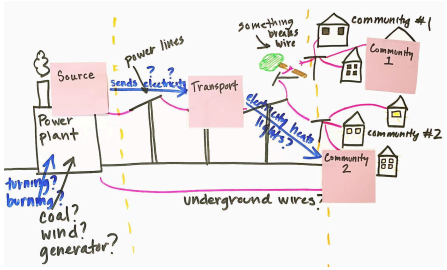
Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).
Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

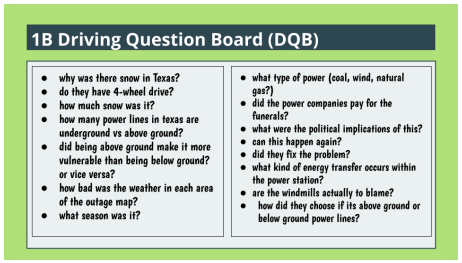
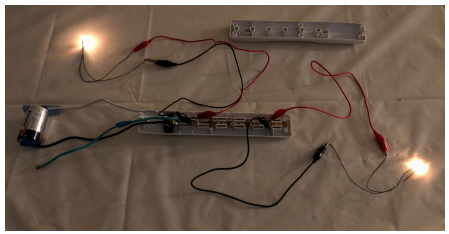
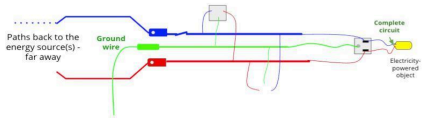
C District Rubrics

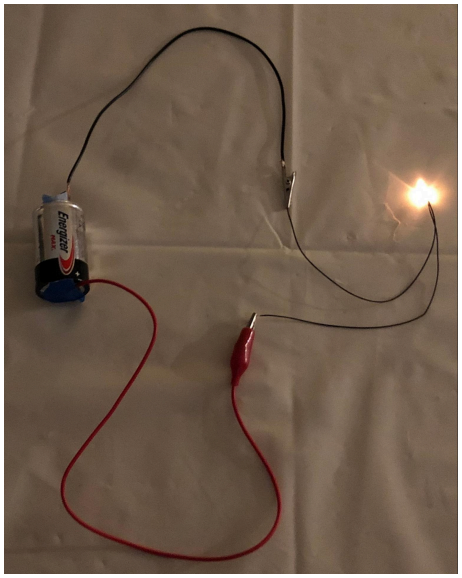
Performance Assessment(s) and Evaluative Criteria:

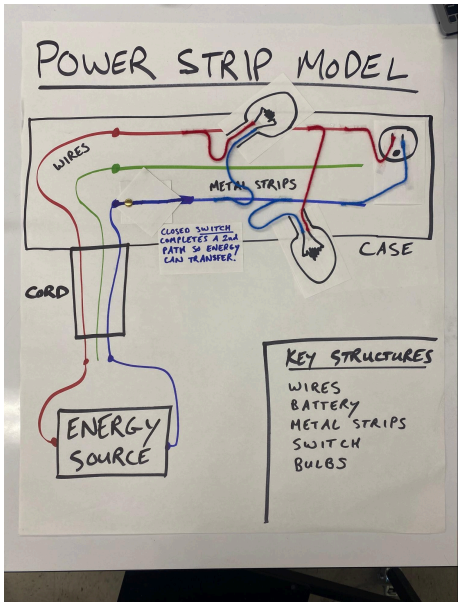
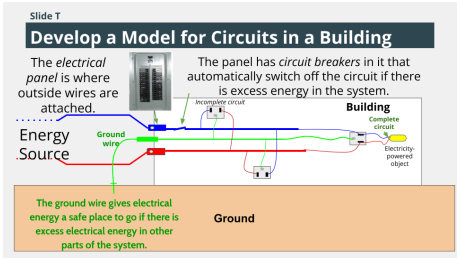
1. LS1 Common Assessment: Motors Transfer Task: Students design, build, and improve a device that converts energy from one form into another within given constraints.
   Success Criteria:
   - develop and use models to explain how energy is transferred and transformed in my device.
   - design and test a device that successfully converts one form of energy into another.
   - refine a design based on evidence, performance data, and design constraints.
2. LS2 Common Assessment: Electricity Tradeoffs Transfer Task: Students use evidence from data and models to explain energy-related challenges and evaluate tradeoffs in energy decisions.
   Success Criteria:
   - analyze data to identify patterns and distinguish between correlation and causation.
   - explain how energy moves through systems and where energy can be transferred out of a system.
   - use evidence to evaluate tradeoffs and propose solutions to energy challenges at different scales.
3. LS3 Common Assessment: Sand and Mirrors Transfer Task: Students develop and use models to explain how energy is stored, transferred, and transformed in systems, and evaluate solutions that improve energy transfer.
   Success Criteria:
   - develop and use models to show how energy is associated with the motion and positions of particles or objects.
   - use evidence and calculations to explain how energy moves through and between systems.
   - evaluate and justify solutions based on energy transfer, efficiency, and design criteria.

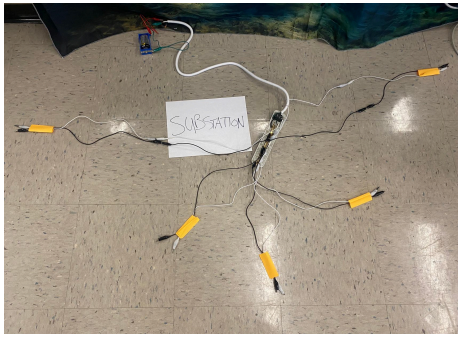
Target Question	Activity	Standard Objectives/Learning Target	Student will know and wonder
Learning Sequence 1: How does Electricity Transfer through Systems, and what causes Instability in those Systems? **Class Notes: LS1 - How does Electricity Transfer through Systems, and what causes Instability in those Systems?**			
Lesson 1: What can we learn from a blackout in Texas about producing reliable energy for our communities? **Lesson 1 - P.1 Energy Flow …**  	**P.1 Lesson 1 Teacher Edition** **-SET THE STAGE FOR THE ANCHORING PHENOMENON**  **-JIGSAW: TEXAS BLACKOUTS ARTICLES** **Texas Article #1** **Texas Article #2** **Texas Article #3** **Texas Article #4** **Texas Article #5** **Texas Article #6** **-NOTICE OUTAGE PATTERNS** **Reference Texas Outages Map** **-NAVIGATE: HOME LEARNING AND EXIT TICKET** **-NAVIGATE: SHARE STORIES AND BROADEN TO RELATED PHENOMENA**	**Learning Target:** I can develop and use a model to explain how energy flows through systems to produce electricity in my community and how changes can cause blackouts. **Success Criteria:** I will… • obtain and share information about the 2021 Texas blackouts. • use my model to explain how disruptions in the system can lead to blackouts. • ask questions to define problems and improve how our community generates and uses energy. **1.A** Develop a model of energy transfer through systems to explain how energy manifests as electricity in our communities, including how changes to an otherwise stable system could cause blackouts. (SEP: 2.3; CCC: 7.1; DCI: PS3.A.2, PS3.B.2, PS3.B.4)	**What students will wonder:** We explore a new phenomenon by reading a series of articles about widespread blackouts in Texas and by drawing on the experiences of our friends and family. We make an initial consensus model of what happens to our electricity production system when it is stable and during a blackout. We develop questions for our Driving Question Board and brainstorm initial ideas about ways we could design more reliable systems to meet our communities' energy needs. We decide to document the electricity infrastructure in our homes and communities to look for patterns that could help us understand how the system works and identify weaknesses. **What students will figure out:** • The term *electricity* describes energy transfer that can power lights and other devices. • There are several

	P.1 Lesson 1 Handout Colle… **-CREATE INITIAL MODELS AND CONDUCT A GALLERY WALK** **Initial Model: Blackouts - Duffy** **-DISCUSS COMMUNITY AGREEMENTS IN A SCIENTISTS CIRCLE** **P.1 Lesson 1 Handout Com…**  Block IB - Our Communication and Collaboration Norms 1. **Respectful:** *How can we make our classroom be a safe space for everyone to share their ideas?* • Listen to other's ideas, be open-minded • Respect privacy • One voice at a time 2. **Equitable:** *How can we make sure everyone's participation and ideas are valued?* • Encourage others • Take turns • Positive feedback 3. **Committed to our community:** *How can we make sure we learn together?* • Participate! • Work as a team • Help others 4. **Moving our science thinking forward:** *How can we work to figure things out?* • Ask questions • Discuss • PRODUCTIVE DISCOURSE • No fear of wrong answer **-COME TO CONSENSUS IN A SCIENTISTS CIRCLE**  **-NAVIGATE: TEST OUR MODEL IN TEXAS** **-BUILD THE DQB**	**1.B** Ask questions to clarify and define the problem of how our community can generate energy by designing systems to address both local and global challenges. (SEP: 1.4; 1.8; CCC: 4.1; DCI: ETS1.A.2)	subsystems that we agree are important for understanding how energy transfers to power our communities when the system is stable and during a blackout. ***What's next?*** *We will compare photos and drawings of structures that provide electricity. We will dissect a power strip and connect it to a battery to power multiple devices. We will develop a model of how structures of the power strip system enable it to transfer energy from one source to multiple devices. We test the effects of short circuits and broken circuits.*

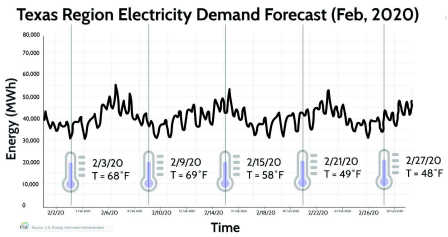
	 **-BRAINSTORM DESIGNS AND FURTHER INVESTIGATION** **-NAVIGATE: REFLECT AND ASSIGN HOME LEARNING**		
Lesson 2: What structures in the system enable energy transfer from one source to multiple devices, buildings, and neighborhoods? **Lesson 2 - P.1 Energy Flow …**  	**P.1 Lesson 2 Teacher Edition** **-DISSECT A POWER STRIP** **Carry out Investigation A to dissect a power strip in groups.** **-POWER THE CIRCUIT** **Power Strip Model - Duffy**	**Learning Target:** I can collect data and use models to explain how electrical energy moves through connected systems and where failures can occur. **Success Criteria:** I will… ● collect and analyze data from power strips and connected systems to identify how energy is transferred. ● identify interaction points and explain where and why failures can happen in the system. ● develop and revise a model that shows similarities between small systems (power strips) and larger systems (buildings).	**What students will wonder:** We compared photos and drawings of structures that provide electricity in our buildings and neighborhoods. We dissected a power strip and connected it to a battery to power multiple devices. We read about the function of ground wires and circuit breakers. We developed a model of how structures of the power strip system enable it to transfer energy from one source to multiple devices. We used this model to draw parallels to larger-scale systems (buildings, neighborhoods) and test the effects of short circuits and broken circuits. **What students will figure out:** ● Energy will transfer from a

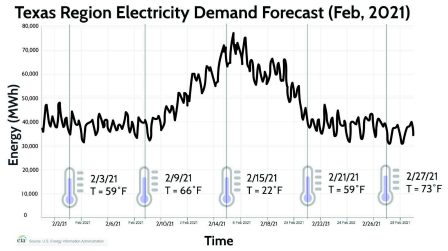
	 **-DEVELOP A MODEL FOR EXPLAINING HOW THE POWER STRIP SYSTEM WORKS** **-CLEAN UP AND ASSIGN HOME LEARNING** **Electricity Related Parts Rea…** **-DEVELOP A CLASS CONSENSUS MODEL FOR HOW THE POWER STRIP SYSTEM WORKS**	**2.A** Collect data from a designed system (a power strip) and a network of interconnected subsystems (multiple powerstrips) on the interactions needed for and failure points in the transfer of electrical energy. (SEP: 3.6; DCI: PS3.A.3; CCC: 4.1) **2.B** Develop, revise, and use a model to identify analogous structures that affect the electrical energy transfers across and between different (sub)systems at different scales (a powerstrip versus a building). (SEP: 2.3; DCI: PS3.B.2; CCC: 4.1, 6.1)	source to a device when a complete circuit is formed, but it will stop transferring immediately when there is a break in any of those paths (a broken circuit). • Plugging in an electronic device creates a giant circuit from that device to a power source that may be far away. • When energy transfers through a circuit system without powering any devices, we call this a short circuit. A short circuit occurs when there is a direct conducting path from one side of the energy source to the ground or to the other side of the source. A single short circuit in a system can cause blackouts in the entire system. ***What's next?*** *We will read about an energy crisis that began in Ohio, and a strategy used by engineers to prevent short and broken circuits in power lines. We will keep track of our ideas in the Engineering Design Tracker. We will develop a new representation to model energy transfer through parts of the system. We will analyze*

	 **-DEVELOP A MODEL FOR CIRCUITS IN A BUILDING**  **-USE THE POWER STRIP MODELS TO INVESTIGATE ELECTRICAL DISTRIBUTION IN A CITY** **P.1 Lesson 2 Teacher Refer…**		*electricity demand and supply data in Texas and use this to brainstorm ideas of where to go next.*

	  **-USE THE MODEL CITY TO INVESTIGATE POWER OUTAGES FROM SHORT CIRCUITS AND BROKEN CIRCUITS** **-ADD TO OUR COMMUNITY AGREEMENTS** **-NAVIGATE** **Raise new ideas and questions about the Texas case study.**		
Lesson 3: Could the blackouts in Texas have been caused by a broken or short-circuited circuit? **Lesson 3 - P.1 Energy Flow …**	**P.1 Lesson 3 Teacher Edition** **-READ ABOUT A POWER**	**Learning Target:** I can use evidence and data to explain how energy moves through the electric	**What students will wonder:** We read about an energy crisis that began in Ohio, and a strategy







OUTAGE EVENT

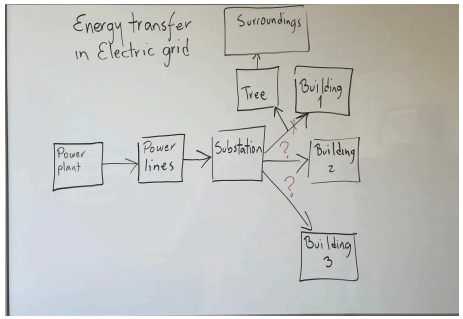
Undergrounding Power Line…

-INTRODUCE THE ENGINEERING DESIGN TRACKER

Engineering Design Tracker

P.1 Lesson 9 Answer Key En…

-DEVELOP A MODEL TO REPRESENT ENERGY TRANSFER IN THE SYSTEM



(insert picture of student model example)

-MODEL ENERGY TRANSFER IN VARIOUS SCENARIOS

Energy Transfer Scenarios - …

-ANALYZE GRAPHS OF FORECASTED ELECTRICITY DEMAND
PART 1:

Electricity Demand Forecast/…

grid and how changes in the system contributed to the Texas power crisis.

Success Criteria: I will…

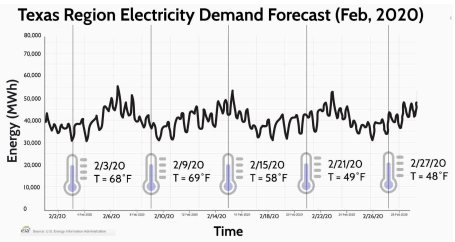
3.A Develop and use a model based on evidence from our investigation in Lesson 2 to illustrate the energy flow between components of the electric grid system and energy loss from the system as a possible cause of the crisis in Texas. (SEP: 2.3; DCI: PS3.B.2, PS3.D.1; CCC: 4.3)

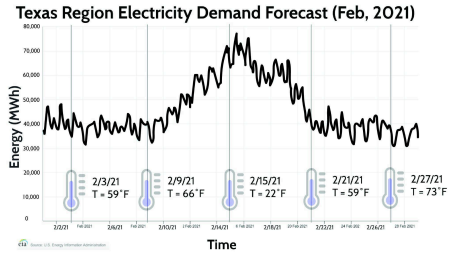
3.B Evaluate the impact of empirical data about energy supply and demand from Texas in February 2020 and 2021 to identify patterns, and evaluate how scientific knowledge and constraints impact possible solutions. (SEP: 4.5, 6.5; DCI: PS3.B.4; CCC 1.5, Connections to Engineering, Technology, and Applications of Science: Influence of Science, Engineering, and Technology on Society and the Natural World)

engineers have used to prevent short and broken circuits in power lines. We use a new tool, the Engineering Design Tracker, to keep track of our ideas to inform possible design solutions, including criteria and constraints. We develop an energy transfer model to explore various scenarios that could result in little or no electrical energy transferred to communities. We analyze data about electricity supply and demand, and we find out that change in supply must match changes in demand to avoid a crisis. We brainstorm ideas of what could have caused the drop in supply we observed in Texas.

What students will figure out:

- Engineering constraints can affect the implementation of a possible solution.
- The production of electrical energy must match the demand for electrical energy.
- The cold temperatures during the Texas blackout probably caused a spike in energy demand, which was accompanied by a drop in

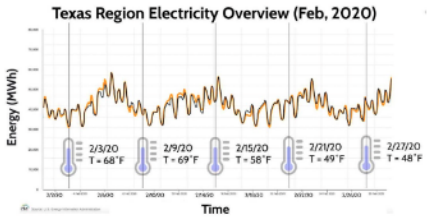


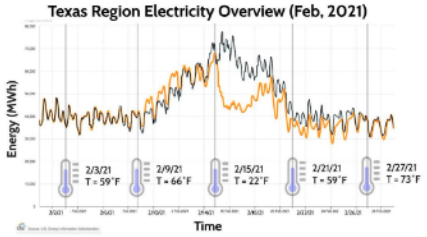


[Hourly Electric Grid Monitor]

-ANALYZE GRAPHS OF ELECTRICITY PRODUCTION AND DEMAND
PART 2:

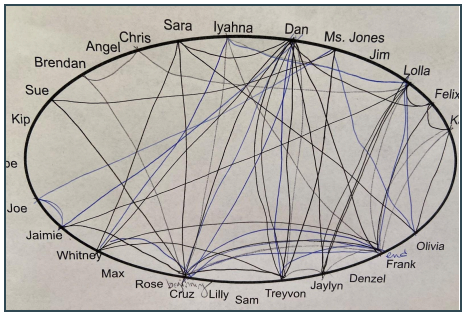
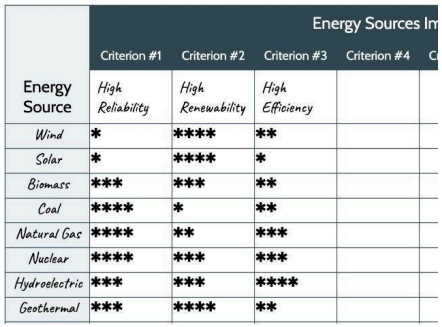
Electricity Demand Forecast/…

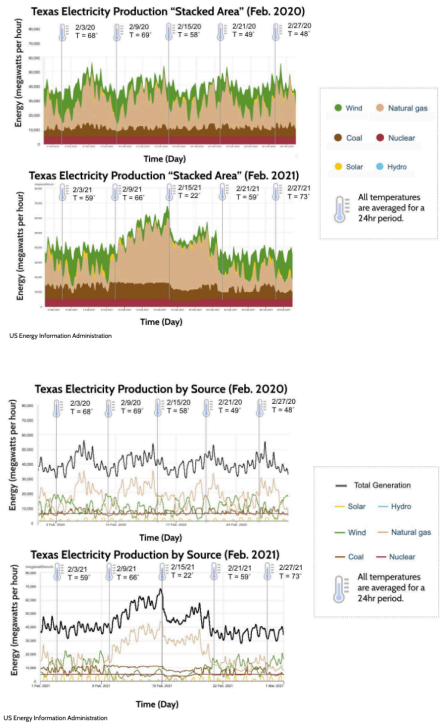




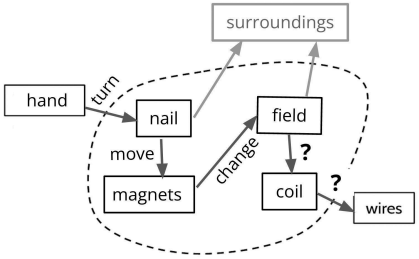
the supply of electrical energy.

What's next?
We will use informational cards and several data representations from the 2021 Texas crisis to seek additional information about specific sources of energy to help us figure out which source might be responsible for the drop in supply. We will use a new tool called Decisions Matrix to keep track of how well each source meets criteria we think are important.

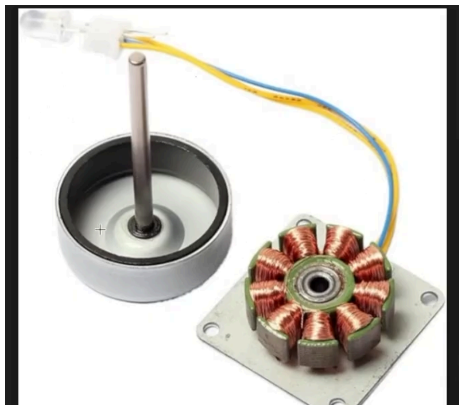
	-DISCUSS ABOUT ENERGY SUPPLY AND DEMAND IN A SCIENTISTS CIRCLE 		
Lesson 4: What makes an energy source reliable? **Lesson 4 - P.1 Energy Flow …**  	**P.1 Lesson 4 Teacher Edition** **-ENGAGE** **(notice and wonder)** **Texas Power Stations - Duffy** **-RANK ENERGY SOURCE CARDS** **Energy Source Cards to Prin…** **P.1 Lesson 4 Handout Energ…** **-CONDUCT A RANKING GALLERY WALK** **(Energy Source Cards)** **-LEAD AN INITIAL DISCUSSION ABOUT RELIABILITY** **-ANALYZE ENERGY SOURCE SUPPLY GRAPHS**	**Learning Target:** I can analyze data about energy sources to explain how different energy systems affect the reliability and stability of the electric grid. **Success Criteria:** I will… • analyze data about different energy sources and their impact on the energy grid. • identify characteristics of energy sources that make the grid more reliable and stable. • explain why energy supply must meet energy demand to keep the system functioning successfully	**What students will wonder:** We look at energy sources used in Texas, and consider what we know about each. We use informational cards to seek additional information about specific sources of energy to help us figure out which source might be responsible for the drop in supply we discovered in Lesson 3. We rank the sources by reliability, but realize that this criterion is hard to quantify. We look at several data representations from the 2021 Texas crisis to analyze how each energy source performed. We use a new tool called Decisions Matrix to keep track of how well each source meets criteria we think are important. **What students will figure out:**

	 **-LEAD A BUILDING UNDERSTANDINGS DISCUSSION ABOUT RELIABILITY OF SPECIFIC ENERGY SOURCES** **-INTRODUCE THE DECISIONS MATRIX** **Decisions Matrix - Duffy**	**4.A** Analyze multiple types of data to identify characteristics of energy sources derived from Earth's systems that increase the reliability of the energy grid (a criterion for success), given that for the system to remain stable, it must be designed for energy supply to meet energy demand. (SEP: 4.6; DCI: ESS3.A.2; DCI: PS3.B.4; CCC: 7.4)	• The energy used to create electricity in a power plant comes from Earth's systems. • Making decisions about complex societal issues like energy production requires defining criteria for success that might not be straightforward or easy to quantify. ***What's next?*** *We will use diagrams of power plants to figure out how they transfer energy into wires, which makes us wonder what is happening inside generators. We will dissect a generator, then build our own, and use compasses to investigate fields. Lastly, we will model energy transfer through fields inside our generators, and make connections between matter and energy to refer to as we move forward.*
Lesson 5: Where does electrical energy come from? **Lesson 5 - P.1 Energy Flow …** **P.1 Constructing DIY Gener…** **P.1 Lesson 5 Prep**	**P.1 Lesson 5 Teacher Edition** **-INITIAL MODELS OF ENERGY TRANSFER IN POWER PLANTS** **Power Plant Diagrams - Duffy**	**Learning Target:** I can develop and test a model of a generator to explain how energy is transferred to produce electricity and light. **Success Criteria:** I will…	**What students will wonder:** We use diagrams of power plants to figure out how they transfer energy into wires, which makes us wonder what is happening inside generators. We dissect a





-MOTIVATE A CLOSER LOOK AT THE GENERATOR



-BUILD A GENERATOR

P.1 Lesson 5 Teacher Refer…
P.1 Constructing DIY Gener…

-DEBRIEF THE GENERATOR INVESTIGATION

Generator Engineering Task …

-NAVIGATE: EXIT TICKET WITH A PARTNER

Point out that there is energy transfer at a distance (without parts of the generator touching), and suggest experiments to investigate this.

- develop a model that shows how energy and matter change within a generator system.
- explain how energy is transferred through moving parts and magnetic fields.
- design, test, and improve a generator system that transfers motion energy into light.

5.A Develop a model based on evidence to illustrate the energy and matter changes in a generator, including energy transfer through contact between moving parts and energy transfer at a distance through fields. (SEP: 2.3, DCI: PS3.A.2, PS3.A.3; CCC: 5.2)

5.B Design and build a generator system to transfer motion energy to light that meets agreed-upon criteria, manipulating variables and collecting data to identify failure points and improve performance. (SEP: 3.6, DCI: PS3.A.2; CCC: 4.1)

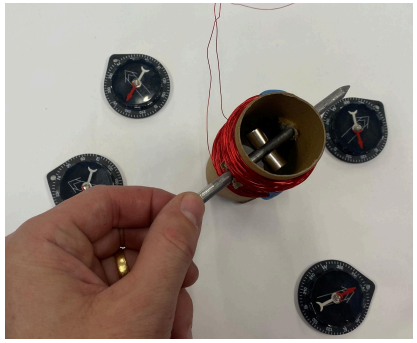
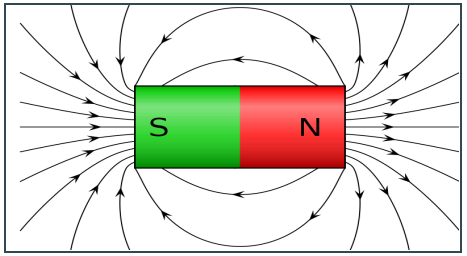
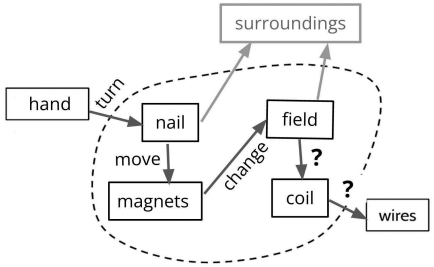
generator, then build our own, and use compasses to investigate fields. Lastly, we model energy transfer through fields inside our generators, and make connections between matter and energy to refer to as we move forward.

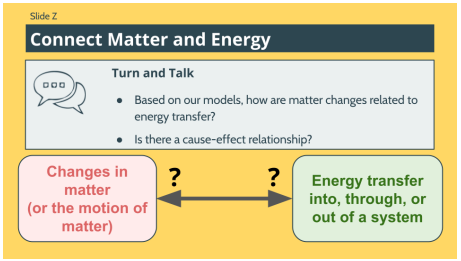
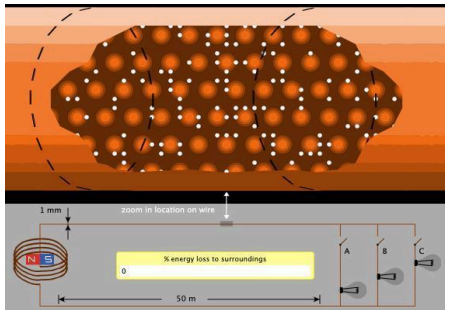
What students will figure out:

- Many power plants have generators, which are loops of copper wire and powerful magnets.
- Matter changes and/or motion can cause energy transfer through contact (and vice-versa).
- The motion of a magnet can generate changing fields, which can cause energy transfer at a distance (and vice-versa).
- When moving matter (e.g., pushing wind or steam) moves the magnets inside a generator, that can cause energy transfer into wires through changing fields.

What's next?

We will read about fields to help us model energy transfer more closely, focusing on transfers inside a wire. Using a simulation, we will explore how characteristics

	-REVISIT COMMUNITY AGREEMENTS: "RESPECTFUL" CATEGORY **-BUILD UNDERSTANDING ABOUT MAGNETISM**   **-MODEL ENERGY TRANSFER IN THE GENERATOR**  		*of an electrical system could influence the transfer of electrical energy, and check our results using classroom equipment. We will then refine our Engineering Design Trackers with ideas from the simulation.*

	-DISCUSS MATTER-ENERGY CONNECTION AND ADD TO THE PROGRESS TRACKER  Slide Z Connect Matter and Energy Turn and Talk • Based on our models, how are matter changes related to energy transfer? • Is there a cause-effect relationship? Changes in matter (or the motion of matter) ? ? Energy transfer into, through, or out of a system **-NAVIGATE: EXIT TICKET** **Connect the generator investigations back to what happened in Texas by completing an exit ticket.**		
Lesson 6: How does energy transfer in wires? **Lesson 6 - P.1 Energy Flow …**  **P.1 Lesson 6**	**P.1 Lesson 6 Teacher Edition** **-DO A CLOSE READING ABOUT FIELDS** **Changing Fields - Duffy** **-MODEL ENERGY TRANSFER IN THE FIELDS READING** **P.1 Lesson 6 Reference Rub…** **-MODEL THE TRANSFER OF MATTER INSIDE A WIRE** **-IDENTIFY MODEL LIMITATIONS AND NEW QUESTIONS** **-NAVIGATE: ASSIGN HOME LEARNING** **Models of Electrons - Duffy**	**Learning Target:** I can use models and simulations to explain how electrical energy is transferred through particles and fields in a system. **Success Criteria:** I will… • use readings, models, and simulations to explain how particles and fields transfer electrical energy. • identify cause-and-effect relationships between particle motion and energy transfer in a system. • use a simulation to analyze electron flow and determine how changes in	**What students will wonder:** We read about fields to help us model energy transfer more closely, focusing on transfers inside a wire. Using a simulation, we explore how characteristics of an electrical system could influence the transfer of electrical energy, and check our results using classroom equipment. We then refine our Engineering Design Trackers with ideas from the simulation. **What students will figure out:** • Electric and magnetic fields change when energy transfers into or out of

Wire Sim Results

- As ... increases, ... decreases.
- As ... increases, ... increases.
- As ... increases, ... doesn't change much.

-INTRODUCE THE COMPUTER SIMULATION

Wire Simulation Investigatio…

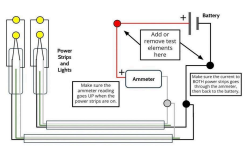
-CONDUCT AN INVESTIGATION USING THE SIMULATION

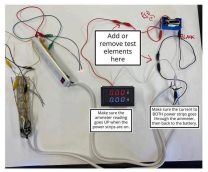
Wire Simulation Investigatio…

-SHARE CONCLUSIONS

-CARRY OUT REAL-LIFE EXPERIMENTS

P.1 Lesson 6 Teacher Refer…





-NAVIGATE: EXIT TICKET

-FILL IN THE ENGINEERING DESIGN TRACKER
Add to the Engineering Design Tracker to include the main ideas on the Wire Sim Results poster.

-ASSIGN THE MOTOR TRANSFER TASK

-REVISIT "MOVING OUR SCIENCE THINKING FORWARD"

-NAVIGATE: EXIT TICKET

variables affect electrical energy transfer.

6.A Integrate information from a reading alongside student-generated models and a computer simulation to examine smaller-scale mechanisms within the system and develop cause-effect relationships about motions of particles or energy stored in fields. (SEP: 8.2; DCI: PS3.A.3; CCC: 2.2)

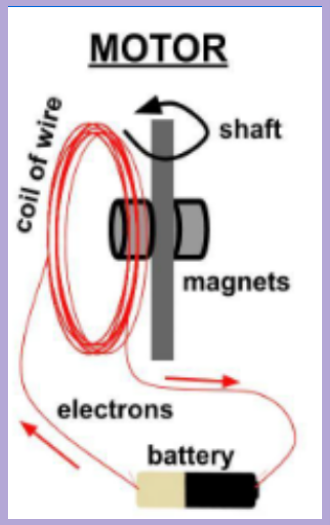
6.B Use a simulation to model electron flow inside a wire in order to identify patterns, answer questions, and determine relationships between independent and dependent variables involving electrical energy transfer that can be interpreted to reengineer and improve the electric grid. (SEP: 1.3; DCI: PS3.A.4; CCC: 1.3)

them.

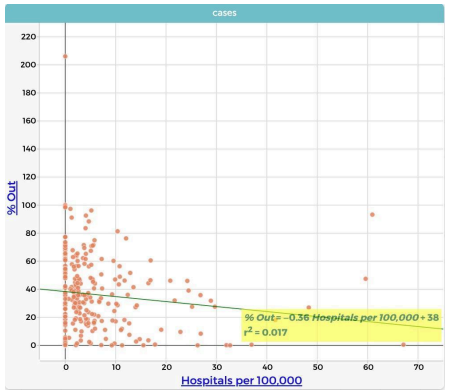
- Electric fields can push electrons. "Electrical energy" is the energy of the movement of electrons transferring through pushes from fields.
- A turbine transfers energy through electric and magnetic fields to the electrons in a wire, causing them to slosh back and forth continuously.
- Electrons cause the atoms of the wire material to heat up, transferring energy from the system to the surroundings as "heat".

What's next?

We will develop a model showing how insufficient supply entering the electrical system could lead to buildings losing power during a crisis. We will test our models using Electric City, and we will notice that to keep the lights on in one building, we need to cut power to others. We will use data to test for correlations with county-level factors, and we will consider limitations on this analysis.

	OPTIONAL: **Algebra in Circuits - Duffy**		
-LS1 Common Assessment: **Motors Transfer Task** Lesson 6: How does energy transfer in wires? **Lesson 6 - P.1 Energy Flow from Earth'…** **P.1 Lesson 6 Teacher Edition** **Built in Canvas using this.** **Answer Key.** 	Motor Speed (rpm)	Temperature After 5 min (°C)
---	---
100	25
200	31
300	39
400	48 | 		**Learning Target:** I can design, build, and improve a device that converts energy from one form into another within given constraints. **Success Criteria:** I will… • develop and use models to explain how energy is transferred and transformed in my device. • design and test a device that successfully converts one form of energy into another. • refine my design based on evidence, performance data, and design constraints. **Transfer Task HS-PS3-3** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy. (SEP: 2.3, 6.5; DCI: PS3.A.2, PS3.A.3, PS3.D.1; CCC: 5.2)	
Learning Sequence 2: What could cause unbalanced effects on communities that experience blackouts? **Class Notes: LS2 - What could cause unbalanced effects on communities that experience blackouts?**			
Lesson 7: What could have caused the disparities we saw in the blackouts in Texas? **Lesson 7 - P.1 Energy Flow …**	**P.1 Lesson 7 Teacher Edition** **-NAVIGATE** **Navigate into the work by deciding to put the pieces together. Brainstorm what to include in a model to show how an insufficient supply could have affected energy transfer into certain communities in Texas when the temperatures dropped.**	**Learning Target:** I can develop and test explanations for how energy supply affects communities and evaluate tradeoffs involved in energy system decisions. **Success Criteria:** I will… • develop a model showing how a decrease in energy supply can reduce energy transfer to communities.	**What students will wonder:** We develop a model showing how insufficient supply entering the system could lead to buildings losing power during a crisis. We test our models using Electric City, and we notice that to keep the lights on in one building, we need to cut power to others. We use data to test for correlations with county-level factors, and we consider limitations on this analysis.





-MODEL IN GROUPS
Have student groups model energy transfer to show how insufficient supply could have affected energy transfer into certain communities in Texas when the temperatures dropped.

-CREATE A CONSENSUS MODEL
Create a consensus model. Highlight what we do not know about how limited supply is distributed during a crisis. Motivate using Electric City to test our ideas.

-USE ELECTRIC CITY TO TEST OUR IDEAS
Use Electric City to model an energy supply crisis. Orient students to the ammeter. Make decisions to keep the lights on in the "hospital".

-NAVIGATE BY CONSIDERING OUR DECISION-MAKING
Have students turn and talk about human decision-making. Make it clear that students' concerns about ethics and decision-making have a rightful presence in the science classroom.

-NAVIGATE WITH A STOP AND JOT

- use evidence to explain how disruptions in the energy system contributed to power outages in Texas.
- develop and test a hypothesis about energy tradeoffs and use data to evaluate the strengths and limitations of my explanation.

7.A Develop a model showing how insufficient supply entering the system could lead to reduced energy transfer into certain communities in Texas when the temperatures dropped, resulting in buildings losing power. (SEP: 2.3; DCI: PS3.B.4; CCC: 5.2, 5.3)

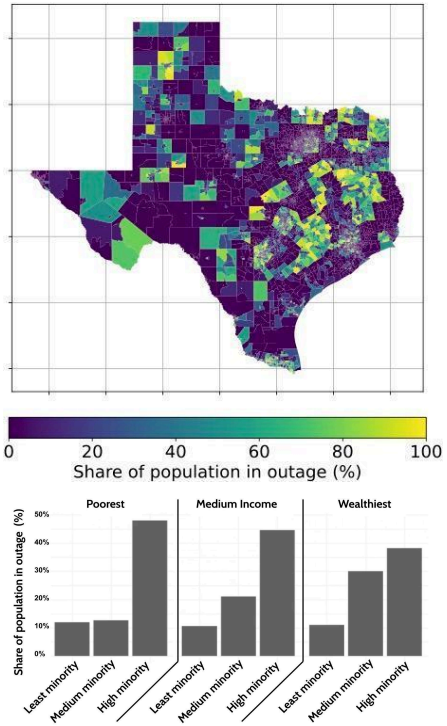
7.B Develop and test a correlational hypothesis to investigate tradeoffs inherent in making decisions about energy, and then consider limitations on this analysis to motivate seeking information about patterns at a smaller grain size. (SEP: 1.6, 4.2, 4.3; DCI: ETS1.B.1; CCC: 2.1, 3.3)

What students will figure out:

- Power companies in Texas probably had to make decisions about who lost power in some places in order to keep the lights on in others.
- There is no one factor that explains why some counties in Texas lost power and others did not.

What's next?
We will listen to a podcast featuring a scientist whose research group used satellite data to investigate patterns in who lost power in Texas. We will read about two fictionalized families in Texas and consider how existing disparities can make the impact of a power outage inequitable across communities. We will consider battery power as a potential solution.

	Have students stop and jot about human decision-making. **-ANALYZING DATA AS A CLASS** **Untitled Document - CODAP** **Lead the class in discussing a hypothesis and making a prediction. Orient to CODAP and run a correlation analysis between hospitals and percent out. Have students turn and talk about what might vary between counties.** **-ANALYZE DATA IN SMALL GROUPS** **Have student groups complete Texas County Data Analysis to develop a hypothesis, test it using CODAP, and consider limitations on the scale of our analysis.** **-DISCUSS LIMITATIONS OF THE DATA SET** **Texas County Data - Duffy** **Motivate a better look at counties by discussing the limitations of our analysis. Use a Turn and Talk to get students thinking about patterns within a county.**		
Lesson 8: Why do design solutions affect some people differently than others? **Lesson 8 - P.1 Energy Flow …**	**P.1 Lesson 8 Teacher Edition** **-NAVIGATE** **Navigate by prompting students**	**Learning Target:** I can analyze information from multiple sources to explain the challenges and tradeoffs involved in making	**What students will wonder:** We listen to (and read the transcript of) a podcast featuring a scientist whose research group

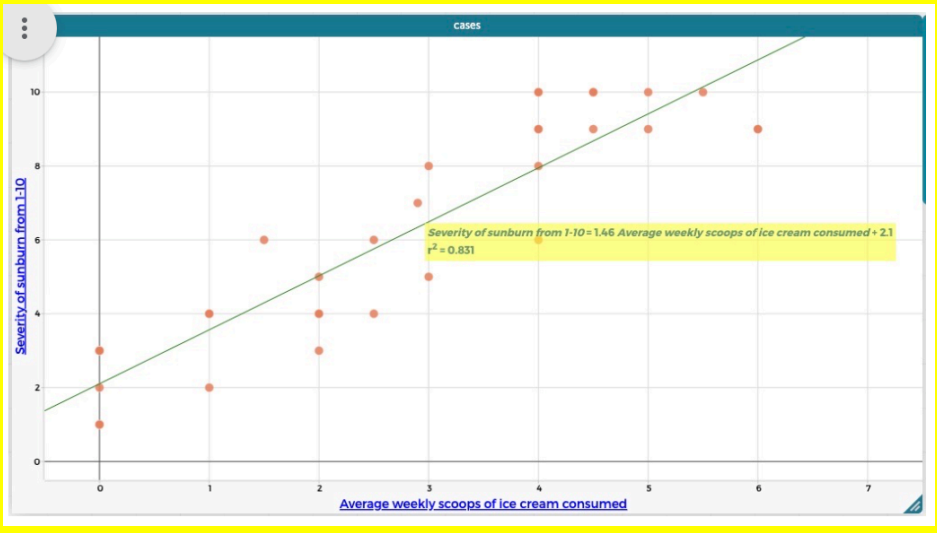
	**to reflect on their questions.** **-LISTEN TO AN INTERVIEW WITH AN EXPERT** **Podcast Transcript Interview** **P.1 Interview With an Expert …** **Have student groups listen to a podcast and discuss questions embedded in its transcript. Use Listening Group Roles Reference to scaffold this task (optional).** **-BUILDING UNDERSTANDING** **Discuss takeaways from the podcast as a class, eliciting ideas about correlation, design solutions, and tradeoffs. Forecast that we will continue to think about tradeoffs inherent in decision-making about power.** **-NAVIGATE** **Discuss tradeoffs that we identified in our last class period to navigate back into the work.** **-REVIEW THE READING'S INTRODUCTION** **Texas Case Studies - Duffy** **Discuss how tradeoffs might affect people differently. Motivate the reading and have partners read the introduction.** **-REVIEW THE READING'S CASE**	energy decisions during periods of high demand and limited supply. **Success Criteria:** I will… • analyze quantitative, visual, and written information about energy supply and demand. • identify challenges and tradeoffs that occur when energy supply decreases during extreme weather events. • use evidence from multiple sources to evaluate different energy decision-making options. **8.A** Integrate quantitative information, visual information, and audio (or text) to define some of the challenges and tradeoffs associated with a drop in energy supply driven by cold weather, and consider additional tradeoffs associated with making energy decisions. (SEP: 8.2; CCC/NOS: 5.2, 5.3; Science Addresses Questions About the Natural and Material World; DCI: ETS1.A.2, ETS1.B.1)	used satellite data to investigate patterns in who lost power in Texas. We discuss takeaways and put together the pieces we have gathered over the past several lessons. We realize that some tradeoffs associated with engineering design decisions affect people in different ways. We read about two fictionalized families in Texas and consider how existing disparities can make the impact of a power outage inequitable across communities. We consider battery power as a potential solution. **What students will figure out:** • An imbalance of energy supply and demand was the primary cause of the blackouts in Texas in February 2021. • Design solutions for avoiding this in the future include interconnected power grids to increase supply when necessary, and winterizing gas pipelines and windmills. • Across Texas, what neighborhood people lived in made an impact on whether they lost power. • Power outages have an

	STUDIES **Have students read the case studies individually and respond to the reflection questions. Then discuss the reading as a class.** **-NAVIGATE: EXIT TICKET** **Assign the electronic Exit Ticket using an online form.**		inequitable impact on people in communities where there are existing disparities. ● Throughout Texas, power companies made decisions to keep the power on in neighborhoods with "essential" buildings. ● All forms of energy production and other resource extraction have economic, social, environmental, and geopolitical costs and risks as well as benefits, which we will need to consider when making decisions about our own communities. ***What's next?*** *We will develop and revise energy transfer models to represent how batteries can make electric grid systems more reliable. We will quantify how much energy was needed to prevent the energy crisis in Texas 2021. We will use data from existing energy storage solutions to calculate the number of batteries needed and the costs associated with adding them to the system.*

-LS2 Common Assessment:
Electricity Tradeoffs Transfer Task

Lesson 8: Why do design solutions affect some people differently than others?
Lesson 8 - P.1 Energy Flow from Earth's Systems
P.1 Lesson 8 Handout Podcast Transcript Interview
Built on Canvas using this.

P.1 Lesson 8 Answer Key L8 Electronic Exit



Learning Target: I can use evidence from data and models to explain energy-related challenges and evaluate tradeoffs in energy decisions.

Success Criteria: I will…

- analyze data to identify patterns and distinguish between correlation and causation.
- explain how energy moves through systems and where energy can be transferred out of a system.
- use evidence to evaluate tradeoffs and propose solutions to energy challenges at different scales.

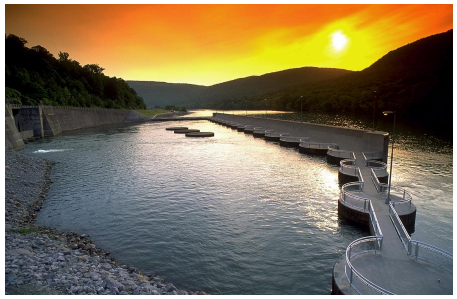
7.A Develop a model showing how insufficient supply entering the system could lead to reduced energy transfer into certain communities in Texas when the temperatures dropped, resulting in buildings losing power. (SEP: 2.3; CCC: 5.2, 5.3; DCI: PS3.B.4)

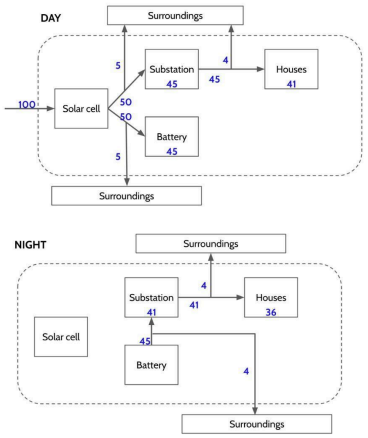
7.B Develop and test a correlational hypothesis to investigate trade-offs inherent in making decisions about energy, and then consider limitations on this analysis to motivate seeking information about patterns at a smaller grain size. (SEP: 1.6, 4.2, 4.3; CCC: 2.1, 3.3; ETS1.B.1)

8.A Integrate quantitative information, visual information, and audio (or text) to define some of the challenges and trade-offs associated with a drop in energy supply driven by cold weather, and consider additional trade-offs associated with making energy decisions. (SEP: 8.2; CCC: 5.2, 5.3, Science Addresses Questions About the Natural and Material World; DCI: ETS1.A.2, ETS1.B.1)

Learning Sequence 3: What Design Solutions could improve Electricity Systems in our Communities?

Lesson 9: How can energy storage make our systems more reliable during an energy crisis? **Lesson 9 - P.1 Energy Flow …**	**P.1 Lesson 9 Teacher Edition** **-NAVIGATE** **Review the design solutions**	**Learning Target:** I can use models and calculations to evaluate how battery storage can	**What students will wonder:** We develop and revise energy transfer models to represent how batteries can make electric grid





that could help power companies generate enough electricity through a crisis.

-INTEGRATE A BATTERY INTO THE ENERGY TRANSFER MODEL

Modeling Reliability - Duffy

P.1 Lesson 9 Answer Key M..

Have students model how adding a battery to a system affects its reliability. Ask students to switch a model with a partner and give feedback.

-CONSIDER A REAL ENERGY STORAGE SYSTEM

Describe the Moss Landing Energy Storage Facility. Calculate how much energy was needed to fill the gap in Texas in February 2021.

-NAVIGATE: PEER FEEDBACK SELF-ASSESSMENT

Reflect on giving and receiving feedback with a self-assessment exit ticket.

-NAVIGATE

Have students share some of their strategies to calculate the number of Moss Landings needed to provide enough energy to prevent an energy crisis in Texas. Carry out the calculation with the class.

improve the stability and reliability of an energy system.

Success Criteria: I will…

- develop and use a model to predict how batteries affect energy transfer and grid stability.
- compare energy systems with and without batteries to explain how energy storage can prevent outages.
- use calculations involving ratios, rates, percentages, and unit conversions to evaluate the feasibility of energy solutions.

9.A Develop an energy transfer model to predict the stability in the distribution of electric energy when batteries are present and absent from the system. (SEP: 2.3; CCC: 7.4; DCI: PS3.B.1, PS3.B.4)

9.B Apply ratios, rates, percentages, and unit conversions to calculate the costs and land area of use of a design solution to evaluate its feasibility for preventing an energy crisis like the one in Texas in 2021. (SEP: 5.5;

systems more reliable. We quantify how much energy was needed to prevent the energy crisis in Texas 2021. We use data from existing energy storage solutions to calculate the number of batteries needed and the costs associated with adding them to the system. We add to our Engineering Design Trackers, and wonder about the non-financial costs of design solutions.

What students will figure out:

- All forms of energy production and other resource extraction have economic, social, environmental, and geopolitical costs and risks as well as benefits, which we will need to consider when making decisions about our own communities.
- Design solutions that store excess energy can prevent an energy crisis by bridging the gap between energy demand and supply.
- Energy storage systems can make an electric grid more reliable by providing power when the energy supply drops.

	-CARRY OUT ADDITIONAL CALCULATIONS **Calculate the cost of the energy storage system in partners, and as a class.** **-EVALUATE ADDITIONAL ENERGY STORAGE SOLUTIONS** **Testing Battery Storage - Duffy** **Raise the issue of challenges to battery installation. Give students 12 minutes to complete Testing Battery Storage Solutions. Have them finish this handout as home learning if time is short.** **-NAVIGATE** **Consider tradeoffs associated with batteries to motivate the home learning reading assignment** **Reading Battery Constructio…** **P.1 Lesson 9 Answer Key En…**	DCI: ETS1.B.1; PS3.D.1; CCC: 3.1)	***What's next?*** *We will read about tradeoffs associated with various energy sources. We will identify the electricity-related values of diverse interested parties. We will begin developing a plan for improving electricity infrastructure in our community.*
Lesson 10: What decisions do we need to make to design more reliable systems to meet our community's energy needs? **Lesson 10 - P.1 Energy Flo…**	**P.1 Lesson 10 Teacher Edition** **-NAVIGATE** **Have students turn and talk about criteria that might be missing from our decision matrices.** **Decisions Matrix - Duffy** **-READ ARTICLES AND IDENTIFY TRADEOFFS IN**	**Learning Target:** I can analyze community perspectives and tradeoffs to define criteria for improving the reliability and impact of energy systems. **Success Criteria:** I will… • gather and analyze information from community members about	**What students will wonder:** We read about tradeoffs associated with various energy sources. We create a Consensus Decisions Matrix that represents the criteria we agree are important when making decisions. We read quotes from interested parties, and develop and carry out an interview protocol to capture the values of people in our community.



Ranking	Criterion* & Reason - Interested Party #1 (Mother)	Criterion* & Reason - Interested Party #2 (Grandmother)
Highest Priority	**Cost:** I have three kids, and I belong to the middle income bracket, which means the cost of living is super high. If the electricity bill were to be cheaper, that would be a big help	**Environmental impact:** I have seen the impact we are having in the environment. My biggest priority is to ensure we do not continue damaging our planet.
Second highest	**Safety:** A power plant can affect our town and our environment, especially if it is going to be close to where I live. I don't want something polluting the air of the water that my family drinks.	**Social impact:** Some communities living close to where the power plants are built might be more affected. I don't want energy generation to affect other communities.
Second lowest	**Environment:** I want to have a planet for my kids and my grandkids.	**Cost:** Electricity is expensive, but I can afford it.
Lowest priority	**Aesthetics:** I want my region to look nice, but it is not a big priority. If it is going to be close to my place and affect my property value, then I would care more.	**Reliability:** I know the fluctuation of energy in this region is not significant, so that is not my main concern.

JIGSAW GROUPS
Assign each student an article about tradeoffs associated with the energy sources we have been investigating. Create jigsaw groups including at least three articles per group to identify additional important criteria and update students' decision matrices.

Biomass Impacts - Duffy
Coal Impacts - Duffy
Gas Impacts - Duffy
Hydropower Impacts - Duffy
Nuclear Impacts - Duffy
Solar Impacts - Duffy

-CONSIDER HOW COSTS AFFECT PEOPLE
Elicit student ideas about costs that are not financial to motivate the need to develop criteria for making decisions about energy production.

-BUILD A CLASS CONSENSUS DECISIONS MATRIX
Have students generate ideas for categories in a Scientists Circle. As a class, decide which criteria to include in a Consensus Decisions Matrix, and rate how well the various energy sources meet them.
Energy Source Cards to Prin…

-NAVIGATE

energy system needs and concerns.
- identify criteria for successful energy solutions, including cost, safety, reliability, and environmental impact.
- evaluate tradeoffs between different energy decisions and explain how they affect communities.

10.A Define the problem, and then interview various interested parties in our community to identify criteria that can help make decisions to improve the electricity infrastructure, including how it is designed for reliability (stability) and its social, cultural, and environmental impacts. (SEP: 1.4, 1.8; DCI: ETS1.B.1; CCC: 7.4)

10.B Analyze data generated by interviews with community members to specify criteria for success related to energy solutions, such as monetary cost, safety, and reliability, and weigh cost/benefit tradeoffs related to social, cultural, and environmental impacts. (SEP: 4.6; DCI: ETS.1.B.1; CCC: Influence of Science, Engineering, and

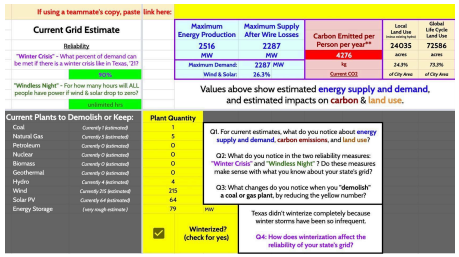
We begin developing a plan for improving electricity infrastructure in our community.

What students will figure out:
- When developing solutions to redesign our electric grid, we need to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to weigh the various social, cultural, and environmental impacts that specific choices may have.
- Input from interested parties and people we know can help us decide which values and priorities should guide how we address tradeoffs in our local energy grid solution.

What's next?
We will use a computational model to measure the success of our solutions against various criteria. We will describe our design solution to our classmates and use each other's feedback to refine our designs. We will celebrate our progress on the Driving Question Board. We will complete an assessment, explaining energy transfer in a solar sand power plant and using data to evaluate

	Have students record their personal rankings of the most important criteria. As an exit ticket, have them place stickers on the Consensus Decisions Matrix to reflect the most important categories for us to weight. **-NAVIGATE: NOTICING PATTERNS** **Review the Consensus Decisions Matrix to identify the criteria that we felt were most important.** **-CONSIDER THE VALUES OF INTERESTED PARTIES** **Motivate the reading about interested parties. Have students read and discuss the interested parties' quotes in pairs or small groups.** **Reference Quotes from Inter…** **-PREPARE TO INTERVIEW INTERESTED PARTIES** **Have students turn and talk about how to represent the values of interested parties before making decisions about energy.** **-DEVELOP A SCRIPT FOR COLLECTING INTERESTED PARTIES' FEEDBACK** **Have students work in partners to develop a script for collecting interested parties' feedback. As**	Technology on Society and the Natural World, Science Is a Human Endeavor)	*its feasibility for providing reliable power to a community.*

	a home learning assignment, students will use their script to interview an interested party. **Interview Protocol - Duffy** **-NAVIGATE** **Have students debrief their interviews in small groups.** **-ADD RANKINGS OF INTERESTED PARTIES TO THE CLASS MATRIX** **Have students add the rankings of the people they interviewed to the Consensus Decisions Matrix.** **-DECIDE HOW TO WEIGHT CRITERIA** **Have students look for new patterns in the importance given to each criterion on the Consensus Decisions Matrix poster. Co-develop a system for weighting the criteria.** **-INTRODUCE THE DESIGN CHALLENGE** **Have student groups complete the first two tasks on the Design Challenge handout to prepare to develop a community plan.** **Design Challenge - Duffy** **Energy Source Statistics - D…** **-NAVIGATE** **complete the Electronic Exit**		

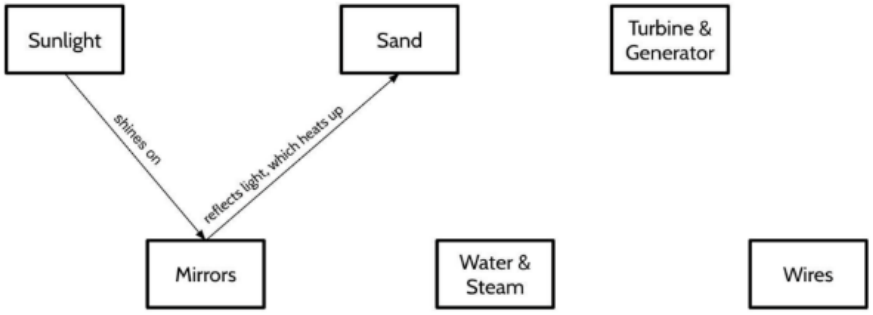
	[Ticket.](#) **P.1 Lesson 10 Answer Key L…**		
Lesson 11: What have we figured out, and what can we carry forward? **Lesson 11 - P.1 Energy Flow…**  	**P.1 Lesson 11 Teacher Edition** **-NAVIGATE** **Reconvene the culminating project groups formed in Lesson 10, and have students discuss criteria and measures.** **-INTRODUCE THE ENERGY GRID CALCULATOR** **Introduce the Energy Grid Calculator as a tool for measuring success against a number of possible criteria.** **Energy Grid Calculator** **-COMPLETE QUESTION 2 OF THE DESIGN CHALLENGE** **Have students complete Question 2 of the Design Challenge using the Energy Grid Calculator.** **P.1 Lesson 11 Answer Key D…** **-INTRODUCE ADDITIONAL FUNCTIONS OF THE ENERGY GRID CALCULATOR** **Demonstrate how to use the Energy Grid Calculator as a tool for simulating grid solutions.** **-COMPLETE PART 2 OF THE DESIGN CHALLENGE** **Have students use the**	**Learning Target:** I can design and refine a solution to improve the electrical grid by using evidence, criteria, and tradeoff considerations. **Success Criteria:** I will… • define a problem related to improving the reliability and stability of the electrical grid. • evaluate and refine a design solution using scientific evidence, models, and established criteria. • consider social, cultural, environmental, and economic tradeoffs when selecting and defending a solution. **11.A** Define a problem related to the challenge of improving our electrical grid, and then design, evaluate, and refine a solution, taking into account social, cultural, and environmental impacts (both intentional and unintentional), based on results from a computational model, scientific knowledge we have figured out	**What students will wonder:** We learn about the Energy Grid Calculator, a computational model we use to measure the success of our solutions against a variety of criteria. We describe our design solution to our classmates, and we give each other feedback that we use to refine our designs. We return to the Driving Question Board and celebrate our progress in light of all the questions we can answer. We work through an assessment task in which we explain energy transfer in a solar sand power plant and use data to evaluate the feasibility of using this technology to provide reliable power to a community. **What students will figure out:** • Solving the problems with our energy grid will require tough choices because all choices have tradeoffs. • Factors that impact whether an energy grid solution is desirable include reliability, cost, carbon emissions, land use, and other factors.

	calculator to make changes to the grid that reflect their design criteria. Then instruct them to complete Q3 of the Design Challenge. **Design Challenge - Duffy** **-COMPLETE PART 3 OF THE DESIGN CHALLENGE** **Instruct students to complete Part 3. Circulate as they work to provide support.** **Design Challenge - Duffy** **-USE A STAYER-STRAYER PROTOCOL TO SHARE IDEAS AND GIVE PEER FEEDBACK** **Describe the stayer-strayer protocol and how students will give peer feedback using the handout.** **-INCORPORATE FEEDBACK INTO PRODUCTS** **Have students return to their original groups and process the feedback they received. Assign the home learning handout.** **P.1 Lesson 11 Handout Peer…** **-NAVIGATE: MAKING CONNECTIONS** **Use crosscutting concepts to review our progress over the course of this unit.** **-RETURN TO THE DRIVING QUESTIONS BOARD**	over the unit, weighted criteria, and tradeoff considerations. (SEP: 1.8, 2.6, 6.5, DCI: ETS1.A.2, ETS1.B.2, ESS3.A.2; CCC: 1.3) **11.B** Ask questions to identify and refine criteria for success for our design solutions, including reliability (stability) and social, cultural, and environmental impacts. (SEP: 1.4, DCI: ETS1.B.1; CCC: 7.4)	• The best solution to the problem of how to improve our energy grid depends on lots of factors, including the values and personal priorities of different people and interested parties. ***What's next?*** ***END OF UNIT***

	Have students work in pairs to determine which questions the class has answered from the DQB. Discuss the questions the class can now answer, and celebrate how far we have come. **P.1 Lesson 11 Handout Revi…** **-ADMINISTER THE FINAL TRANSFER TASK** **Set the context for the assessment and have students complete the assessment task in class.**		
-LS3 Common Assessment: **Sand and Mirrors Transfer Task** **Built in Canvas using this.** **P.1 Lesson 11 Answer Key Sand and Mirrors**		**Learning Target:** I can develop and use models to explain how energy is stored, transferred, and transformed in systems, and evaluate solutions that improve energy transfer. **Success Criteria:** I will… • develop and use models to show how energy is associated with the motion and positions of particles or objects. • use evidence and calculations to explain how energy moves through and between systems. • evaluate and justify solutions based on energy transfer, efficiency, and design criteria. **Transfer Task PE: HS-PS3-2** Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative positions of particles (objects). (SEP: 2.3, 4.6, 5.5; DCI: PS3.A.1, PS3.A.2, PS3.A.4, PS3.B.1, PS3.B.4, PS3.D.1, ETS1.B.1; CCC: 5.2, 5.3)	



Only prototypes of 'sand power plants' exist right now Amble, CC BY-SA 4.0



Energy Flow from Earth's Systems

Energy in the Environment-Unit 2

Written by Kelsey Duffy
Presentation Created by Nicole Raccio
October 21, 2026



Unit 2: Energy Flow from Earth's Systems

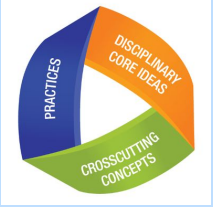
The students will explore how to design a more reliable systems to meet the communities' energy needs. **This unit is designed to introduce students to the concept of energy transfer in a relevant and grounded context: the Texas power crisis of February 2021.** Students read articles and wonder about the complex social, environmental, and physical realities that led to such a crisis. They figure out how energy transfers between systems from a generator to our communities, and what makes an energy source reliable. This allows the class to model and explain what happened in Texas at multiple scales, from the electrons in the wires to the power companies making difficult decisions to maintain stability. Students consider engineering tradeoffs, criteria, and constraints inherent in making decisions about our energy systems, and apply them in a culminating task: **design a reliable energy solution that meets our communities' needs, as articulated by interviews with friends and family members. The task is designed to give students the tools to speak up in their local and global community for a better energy future, one that aligns with their own values, and those of their families.**



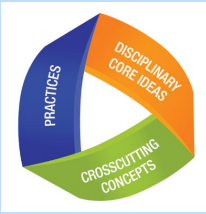
A winter storm in Texas in February 2021 led to devastating widespread blackouts throughout the state.

Standards Assessment

- **HS-PS3-2** Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motion of particles (objects) and energy associated with the relative positions of particles (objects).
- **HS-PS3-3** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
- **HS-PS3-1** Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.
- **HS-ESS3-2** Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.



SEPs, DCIs, & CCCs



Science & Engineering Practices (SEP)

- Developing and Using Models
- Constructing Explanations and Designing Solutions
- Engaging in Argument from Evidence

Disciplinary Core Ideas (DCI)

- PS3.A: Definitions of Energy
- S3.D: Energy in Chemical Processes
- ESS3.A Natural Resources

Crosscutting Concepts (CCC)

- Energy and Matter

Learning Sequence 1:

How does Electricity Transfer through Systems, and what causes Instability in those Systems?

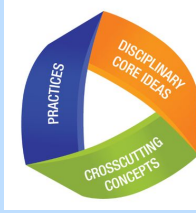
Lesson Level Questions:

- What can we learn from a blackout in Texas about producing reliable energy for our communities?
- What structures in the system enable energy transfer from one source to multiple devices, buildings, and neighborhoods?
- Could the blackouts in Texas have been caused by a broken or short-circuited circuit?
- What makes an energy source reliable?
- Where does electrical energy come from?
- How does energy transfer in wires?



Learning Sequence 1:

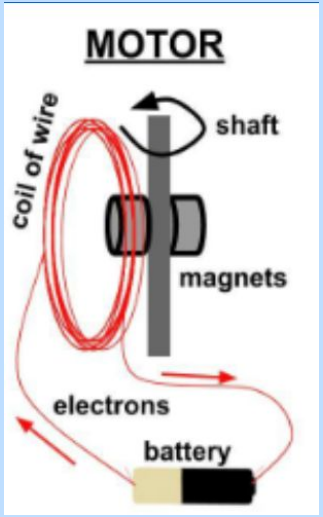
How does Electricity Transfer through Systems, and what causes Instability in those Systems?



Learning Objectives

- I can develop and use a model to explain how energy flows through systems to produce electricity in my community and how changes can cause blackouts.
- I can collect data and use models to explain how electrical energy moves through connected systems and where failures can occur.
- I can use evidence and data to explain how energy moves through the electric grid and how changes in the system contributed to the Texas power crisis.
- I can analyze data about energy sources to explain how different energy systems affect the reliability and stability of the electric grid.
- I can develop and test a model of a generator to explain how energy is transferred to produce electricity and light.
- I can use models and simulations to explain how electrical energy is transferred through particles and fields in a system.

Assessment:
Motors Transfer Task



Motor Speed (rpm)	Temperature After 5 min (°C)
100	25
200	31
300	39
400	48

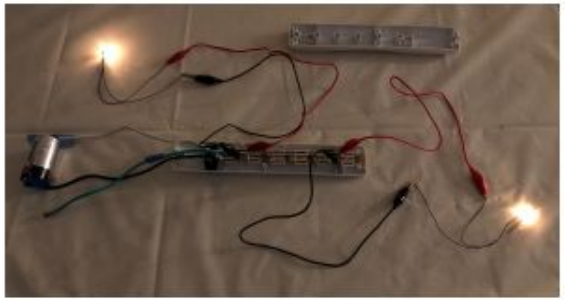


Learning Target: I can design, build, and improve a device that converts energy from one form into another within given constraints.

Success Criteria: I will…

- develop and use models to explain how energy is transferred and transformed in my device.
- design and test a device that successfully converts one form of energy into another.
- refine my design based on evidence, performance data, and design constraints.

What students figure out



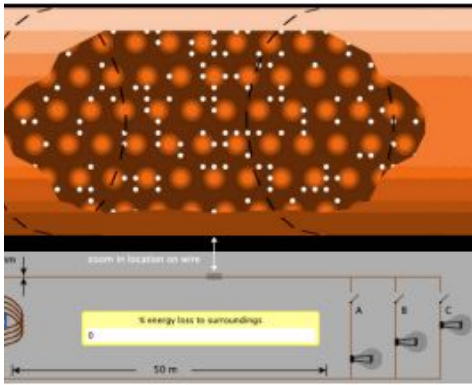
In a power strip, there are three pieces of metal that are each connected to three wires within the plug. Similar structures are found within a house, and even within electrical grid substations.



A light connected to generator glows and nearby compass needles change direction when either the magnet or wires in a generator moves.



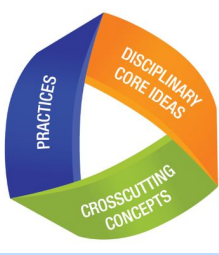
Descriptive and graphic data on a variety of energy sources reveal puzzling inconsistencies in each energy source's reliability during the blackout.



A simulation of electrons in a wire shows their motion with various circuit configurations and power sources, and it provides a measure of energy and current in various parts of the system.

Learning Sequence 2:

What could cause unbalanced effects on communities that experience blackouts?



Lesson Level Questions

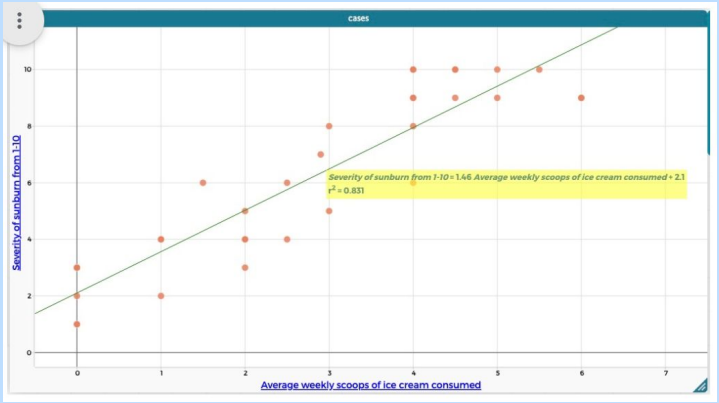
- What could have caused the disparities we saw in the blackouts in Texas?
- Why do design solutions affect some people differently than others?

Learning Targets

- I can develop and test explanations for how energy supply affects communities and evaluate tradeoffs involved in energy system decisions.
- I can analyze information from multiple sources to explain the challenges and tradeoffs involved in making energy decisions during periods of high demand and limited supply.

Assessment:

Electricity Trade Offs Transfer Task



Learning Target: I can use evidence from data and models to explain energy-related challenges and evaluate tradeoffs in energy decisions.

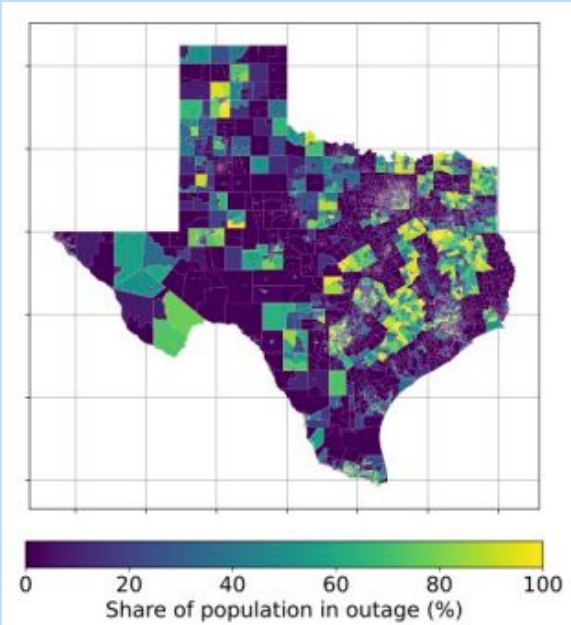
Success Criteria: I will…

- analyze data to identify patterns and distinguish between correlation and causation.
- explain how energy moves through systems and where energy can be transferred out of a system.
- use evidence to evaluate tradeoffs and propose solutions to energy challenges at different scales.

What students figure out



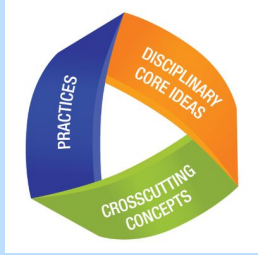
A data set shows disparities between counties impacted by the energy crisis in Texas that is not well explained by our model.



Scientists looking at satellite data uncovered patterns in the Texas power outages that we could not discern at a county-level scale.

Learning Sequence 3:

What Design Solutions could improve Electricity Systems in our Communities?



Lesson Level Questions

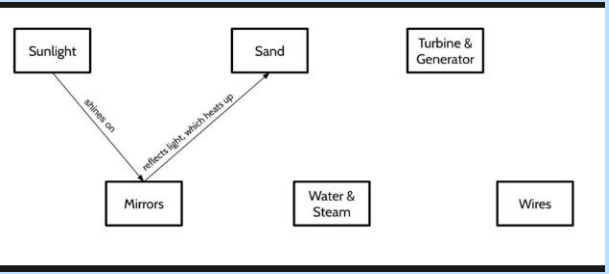
- How can energy storage make our systems more reliable during an energy crisis?
- What decisions do we need to make to design more reliable systems to meet our community's energy needs?
- What have we figured out, and what can we carry forward?

Learning Targets

- I can use models and calculations to evaluate how battery storage can improve the stability and reliability of an energy system.
- I can analyze community perspectives and tradeoffs to define criteria for improving the reliability and impact of energy systems.
- I can design and refine a solution to improve the electrical grid by using evidence, criteria, and trade off considerations.

Assessment:
Sand and Mirrors Transfer Task


Only prototypes of 'sand power plants' exist right now Amble, CC BY-SA 4.0



Learning Target: I can develop and use models to explain how energy is stored, transferred, and transformed in systems, and evaluate solutions that improve energy transfer.

Success Criteria: I will…

- develop and use models to show how energy is associated with the motion and positions of particles or objects.
- use evidence and calculations to explain how energy moves through and between systems.
- evaluate and justify solutions based on energy transfer, efficiency, and design criteria.

What students figure out



Batteries are not currently widely used in power grids.



There are multiple criteria, constraints, and tradeoffs to consider in making engineering decisions, and the interested parties in our communities don't always agree.



Complex global challenges manifest in our communities. Developing solutions will require science practices and creative design thinking.


Thank you!

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 10 c.

AGENDA REPORTING FORM

Agenda Topic: SHS Accelerated General Chemistry - Unit 1, Illuminating Matter - NEW - Second Reading.

Summary of Issue: The Curriculum & Instruction Committee has reviewed the SHS Accelerated General Chemistry - Unit 1, Illuminating Matter - NEW.

Background: _____

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Move that the Board of Education approve the SHS Accelerated General Chemistry - Unit 1, Illuminating Matter - NEW – as presented by the Curriculum & Instruction Committee.

Titles of Attachments:

1. Course Proposal

Signature of Staff Member Submitting Report

Signature of Superintendent of Schools

Unit Overview	
Unit Title:	General Chemistry Bundle 1: Illuminating Matter
Teacher:	Rich Niro & Lisa Daigle
Grade Level/Course:	9-12 Accelerated General Chemistry
Length/Dates:	8 weeks (22 Blocks)
Unit Summary:	Students figure out how a light bulb works by learning about atoms, subatomic particles, and electron behavior. Students learn that the electron produces what we see as light and mathematically calculate the energy required to see certain colors using Plack's equation which expands upon their understanding of the relationship between wavelength and frequency. Using periodic trends and reactivity, students understand why tungsten and argon are used in lightbulbs to get them to work and produce light.

Performance Expectations

This unit builds toward these performance expectations:

- HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.
- HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
- HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

Essential Questions:

1. Why do some elements produce light in incandescent light bulbs but others can't?
2. How do light bulbs produce light and how do some types of light bulbs produce different colors of light?
3. Why do some elements react more than others and why is that important for designing and choosing materials for a light bulb?

Science and Engineering Practices (Skills)	Disciplinary Core Ideas (Knowledge)	Crosscutting Concepts (Enduring Understandings)
This unit **intentionally develops** students' engagement in these practice elements: **Developing and Using Models** Modeling in 9–12 builds on K–8 and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed world(s). ● Use a model to predict the relationships between systems or between components of a system. **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and	**PS1.A: Structure and Properties of Matter** ● Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons. ● The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states. **PS1.B: Chemical Reactions** ● The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe	This unit **intentionally develops** students' engagement in these crosscutting concept elements: **Patterns** ● Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena. **Cause and Effect** ● Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

independent student-generated sources of evidence consistent with scientific ideas, principles, and theories. ● Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, and peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. **Using Mathematics and Computational Thinking** Mathematical and computational thinking at the 9-12 level builds on K-8 and progresses to using algebraic thinking and analysis; a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms; and computational tools for statistical analysis to analyze, represent and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions. ● Use mathematical representations of phenomena or design solutions to	and predict chemical reactions. **PS4.A: Wave Properties** ● The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the type of wave and the medium through which it is passing.	

describe and/or support claims and/or explanations.		

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).
Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.
Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

C District Rubrics

Performance Assessment(s) and Evaluative Criteria:

1. LS1 Common Assessment: Illuminating Matter Assessment
   Success Criteria:
   - Use the periodic table to predict properties of elements
   - Analyze and interpret data
   - Use calculations when given a problem to figure out the number of protons, neutrons, electrons, and/or charge
   - Calculate the average atomic mass of an element using mathematics
   - Critical Thinking
     - Interpretation & Analysis
     - Reasoning
     - Problem Solving/Solution Finding

2. LS2 Common Assessment: Flame Test Performance Task
   Success Criteria: I will…

- Conduct an experiment
- Identify the unknown element
- Complete an orbital diagram and electron configuration of an element
- Calculate frequency and energy of the color of light of the unknown metal
- Write a CER to support the identification of your unknown metal
- Collaboration & Critical Thinking
    - Cooperation
    - Constructing Arguments

LS2 Common Assessment: Electron Energy Assessment

Success Criteria:

- Determine the number of subatomic particles of an atom
- Use the speed of light equation to solve for frequency or wavelength
- Use Planck's Equation to solve for energy or frequency
- Be able to explain and support the mathematical relationships between energy, frequency, and wavelengths
- Strong understanding of electron behavior and light
- Complete orbital diagrams of atoms using the periodic table
- Complete electron configurations of atoms using the periodic table
- Critical Thinking
    - Interpretation & Analysis
    - Reasoning
    - Problem Solving/Solution Finding

3. LS3 Common Assessment: Designing the Best Lightbulb Filament Performance task

Success Criteria:

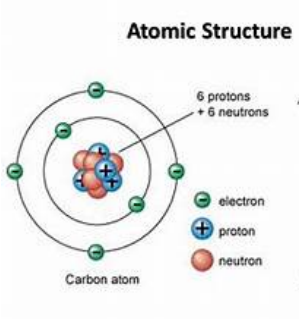
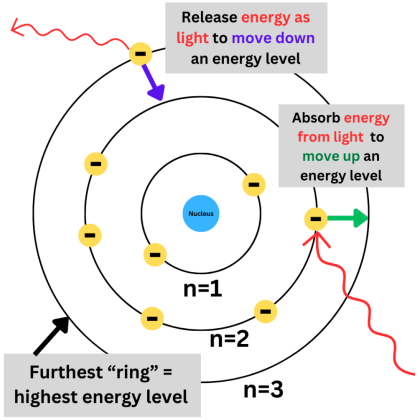
- Use the periodic table to predict properties of elements.
- Compare melting points and explain why they matter.
- Analyze ionization energy, electronegativity, and atomic radius.
- Use evidence to justify an engineering decision.
- Collaboration & Creativity
    - Cooperation
    - Creative Production & Innovation

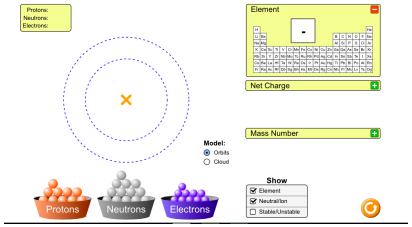
4. LS3 Common Assessment: Periodic Trends Assessment

Success Criteria:

- Use Coulomb's Law to describe the trends on the periodic table
- Use trends on the periodic table to support reactivity for main group elements
- Critical Thinking
  - Interpretation & Analysis
  - Reasoning
  - Problem Solving/Solution Finding

Driving Question	Activity	Standard Objectives/Learning Target	Student will know and wonder
Learning Sequence 1: Why do some elements produce light in incandescent light bulbs but others can't?			
Lesson 1: What makes something glow, and why did early inventors struggle to create practical lightbulbs? (0.5 block) 	Light bulb Teacher Slides … 1. Initial model building: What do students think is happening inside a lightbulb? a. Article - Chemistry of the light bulb (can provide any time after initial model) b. Infographic	**Learning Target**: Develop a model to show how lightbulbs work at the subatomic level to produce light by identifying patterns in the data provided about how they work. **Success Criteria**: I will… • Create a detailed initial model about how lightbulbs work including the data provided. • Ask questions and make predictions about the chemistry of light bulbs **1.A** Develop a model to show how lightbulbs work at the subatomic level to produce light by identifying patterns in the	Students create a model based on how they think the lightbulb works based on what they think and the data provided. Students learn that the metal in the lightbulb is tungsten. They also learn about different types of lightbulbs and learn that different materials are more efficient than others. This helps students refine their initial models to add more details. Students will wonder how the light is produced and why tungsten is used in regular lightbulbs.

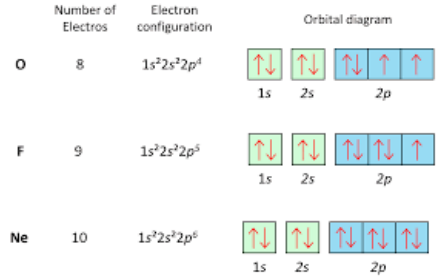
		data provided about how they work.	
Lesson 2: How does the arrangement of atoms and electrons determine what materials can produce light? (3 blocks)   	Light Bulb Teacher Slides… **Activities**: 1. Interactive Periodic Table a. PT Coloring b. Updated sheet i. Answer Key c. Families of the Periodic Table Graphic Organizer i. Key 2. **How Big is an Atom?** - Ted Ed Video 3. Build an Atom Phet Sim. With worksheet: Phet WS a. Check in: Calculating Subatomic Particles OR Canvas Check In 4. Average Atomic Mass a. Isotope Notation b. Calc Avg. Atomic Mass c. Abun. of Isotopes d. AMU Problems e. Optional Practice	**Learning Target**: Use the periodic table as a model to predict basic properties of different elements by identifying patterns in different families **Learning Target:** Use a computer simulation and the periodic table as a model to calculate the number of protons, neutrons, and electrons as well as find patterns with the subatomic particles to classify a neutral atom, an isotope, and an ion. **Learning Target**: Use math to solve for the average atomic mass to develop a deeper understanding of the decimal on the periodic table for each element. **Learning Target:** Develop or use the Bohr model to illustrate the subatomic particles in an atom and recognize patterns of subatomic particle placement in different materials when building or drawing these models **Success Criteria**: I will… ● Explain and define	Students become familiar with the periodic table and learn that it is arranged based on their basic properties and organized into families. Students learn about the structure of an atom and learn that protons, neutrons, and electrons are the subatomic particles. They learn that protons determine the element while in conjunction with neutrons, this determines the element's mass number. Electrons are the subatomic particles where their mass is negligible. Students will wonder why light bulbs can be different colors.

	 5. Bohr Models & Valence Electrons a. Only the last page is graded. Students should complete the last 2 pages independently. b. Extra Practice (optional): Bohr Model Practice c. Bohr Model Stations (Optional) **Optional Extension:** 1. Elements Bracket - Generates student-to-student discussion of the BEST element. **References:** 1. Review: Periodic Table Notes	different families of the periodic table and their properties • Use the periodic table to determine the number of protons, neutrons, and electrons in an atom and classify neutral atoms, isotopes, and ions • Develop a mathematical understanding for the average atomic mass • Differentiate between the average atomic mass of an element and the mass number of an atom • Develop or use a Bohr model to identify an element and their arrangement of electrons • Determine the number of valence electrons in an atom using the periodic table **2.A** Use the periodic table as a model to predict properties of elements by defining patterns in the different families of the periodic table. **2.B** Use mathematical thinking to solve for the average atomic mass to describe the decimal seen on the periodic table.	

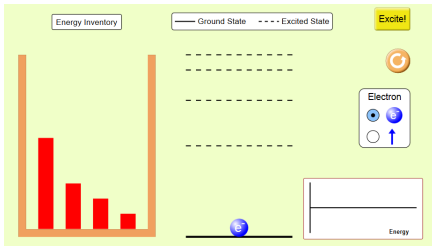
	2. Or Periodic Families Notes 3. Periodic table notes 4. Bohr Model Notes **Textbook References:** **Note-taking guide** 5. 1.1 Chemistry in Context 6. 1.2 Phases and Classifications of Matter 7. 1.3 Physical and Chemical Properties 8. 2.1 Early Ideas in Atomic Theory 9. 2.2 Evolution of Atomic Theory 10. 2.3 Atomic Structure and Symbolism 11. 3.2 The Bohr Model 12. 3.6 The Periodic Table	**2.C** Use the Bohr model to illustrate the subatomic particles in an atom and recognize patterns of subatomic particle placement in different materials when building or drawing these models.	
Assess on Atomic Structure and Periodic Location **Lesson 3 Teacher Slides Light Bulb** **Lesson 3: Illuminating Matter, Quiz 1 Version 2** **Review options:** 1. **Study Guide & Practice:** **[As Stations] [As Worksheet] (45-60 min.)**		**Learning Target**: Interpret models, tables, and graphs to predict properties of elements and use mathematics and computational thinking to calculate subatomic particles or average atomic mass by utilizing your knowledge and patterns of the periodic table. **Success Criteria**: I will… • Use the periodic table to predict properties of elements • Analyze and interpret data related to physical properties of elements • Use calculations when given a problem to	

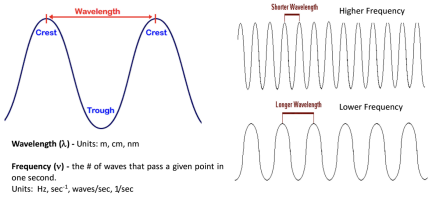
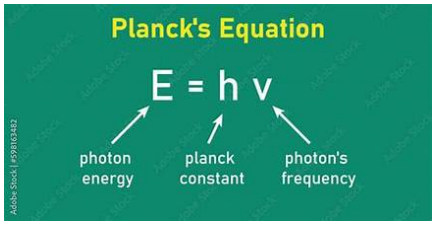
2 blocks with review		figure out the number of protons, neutrons, electrons, and/or charge for an atom, isotope, or ion
		• Calculate the average atomic mass of an element using mathematics
		• VoG: Critical Thinking
		  ○ Interpretation & Analysis
		  ○ Reasoning
		  ○ Problem Solving/Solution Finding
		
		3.A Use and interpret models, tables, and graphs to predict properties of elements by identifying patterns on the periodic table or diagrams provided.
		3.B Use mathematics and computational thinking to calculate subatomic particles or average atomic mass by using the patterns on the periodic table or natural abundance of isotopes.	

Learning Sequence 2: How do light bulbs produce light and how do some types of light bulbs produce different colors of light?			

Lesson 4: How do electrons moving between energy levels produce light?
(3 blocks)

 	
	Lesson 4 Teacher Slides L…
	
	1. Related Phenom. Intro - Science of Fireworks Article
	2. Electron Configuration POGIL
	3. Electron Configuration Interactive
	4. Electron Configuration walkthrough
	  a. Designed for Canvas
	  b. Paper Version
	5. Electron Configuration Practice OR Electron
		Learning Target: Use the periodic table to illustrate orbital diagrams and write electron configurations in both the ground and excited states of different elements to find patterns on the periodic table of the arrangement of electrons
		
		Success Criteria: I will…
		• Draw ground state and excited state orbital diagrams
		• Write electron configurations using the periodic table, both longhand and shorthand
			Students learn that electrons do not “orbit” the nucleus like planets. Instead, they are most likely found in suborbitals around the nucleus in more complex patterns. Students learn to model electron configurations and write them long-hand and shorthand to gain a better understanding of more modern thinking of electron behavior. Students understand that there is a pattern on the periodic table based on the electron arrangement of different elements which is another way the periodic table is organized,

	configuration practice worksheet **Supporting Resources:** 1. Electron Configuration Periodic Table Coloring Blank Periodic Table 2. Electron Configuration Notes 3. Periodic Table Method (Youtube) 4. Forbes Article a. Google Doc Version **Textbook References:** **Note-taking Guide** 1. 3.1 Electromagnetic Energy 2. 3.3 Development of Quantum Theory 3. 3.4 Electronic Structure of Atoms (Electron Configurations)	**4.A** Use the periodic table as a model to illustrate orbital diagrams and write longhand and shorthand electron configurations of ground states and excited states of elements to support patterns in electron arrangement of elements on the periodic table.	not simply based on families. Noble gases have full energy levels, which is why one of their properties is that they do not react. Now that they know how to write electron configurations and understand the modern way of thinking, students will wonder why there are different colors released when electrons return to their ground state.
Lesson 5: Why do light bulbs produce light? (2 blocks)	Lesson 5 Teacher Slides L… 1. Hahn version including exciting electrons ○ Original document: Exciting Electrons 2. Electron Arrangement	**Learning Target:** Use a simulation and Bohr models to demonstrate the energy needed to excite an electron and find patterns between frequency and wavelengths of different colors of light	Students gain a better understanding of exciting electrons- in order for electrons to be excited, they need to absorb some type of energy to be able to jump to the next suborbital or energy level.

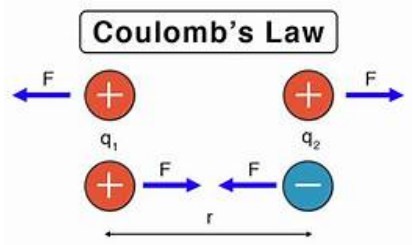
 	and Light Basics 3. Analyzing the Fingerprints of Light ○ Consider posting on Canvas to see the colors on the graphs 4. Electron Behavior and Light **Textbook References:** 4. 3.1 Electromagnetic Energy 5. 3.3 Development of Quantum Theory 6. 3.4 Electronic Structure of Atoms (Electron Configurations)	**Learning Target:** Use spectral graphs and 'light fingerprints' to identify elements and evaluate the emission patterns of various light bulbs (Incandescent, Fluorescent, and LED) **Learning Target:** Revise your initial model to include electron behavior and light to show how light bulbs produce light. **Success Criteria:** I will… ● Explain the electron's energy needs to produce light ● Describe how the color of light depends on the wavelength released from the photon and compare it to the frequency ● Interpret spectral graphs and apply to different light sources ● Revise your initial model of the light bulb to include energy **5.A** Use the Bohr model and computer simulation to help predict patterns in electron behavior to understand the conceptual mathematical relationships between	Students learn that different types of light bulbs need different types of energies to produce light. ● Incandescent: thermal energy excites electrons ● Fluorescence: photon absorption and re-emission ● LED: semiconductor electron transitions Students are now wondering how energy is related to light produced.

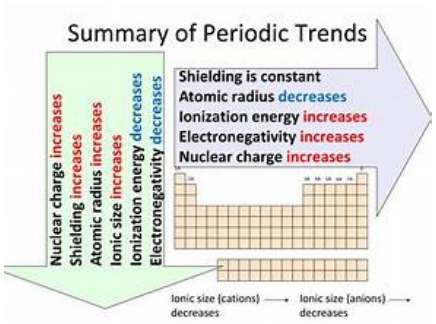
		wavelength and frequency to discover patterns with different colors of light produced. **5.B** Analyze and interpret spectral graphs and apply electron behavior to evaluate emissions patterns of various light production technologies. **5.C** Update the initial model to describe electron behavior to show how wavelength and frequency are related for light bulbs to produce the traditional yellow light.	
Lesson 6: How do wavelength, frequency, and energy help us understand the behavior of light? (2 Blocks)  	1. Lesson 6 Teacher … 2. Electromagnetic Radiation POGIL 3. Light Equation Worksheet 4. Planck's Equation Worksheet 5. Light and electronic transitions article a. (teacher's guide for article) 6. Bohr's Model and Energy Calculations **Textbook References:** 7. 3.1 Electromagnetic Energy	**Learning Target**: Use the speed of light and Planck's equation to mathematically support the relationships between the variables in the speed of light and Planck's equations to quantitatively understand different colors of light happen due wavelength, frequency, and electron energy **Learning Target**: Construct explanations from the article to explain how light is produced at the macroscopic and microscopic levels **Success Criteria**: I will… ● Understand the	Students understand the mathematics involved with the relationships between wavelength, frequency, and the speed of light. Wavelength and frequency are inversely related to light. Bringing in Planck's equation for the energy piece, it illustrates the direct relationship between energy and frequency. Now that students understand the fundamentals of electron behavior and light, students are now wondering about the material piece, so we need to revisit the periodic table and more trends.

	8. 3.3 Development of Quantum Theory 9. 3.4 Electronic Structure of Atoms (Electron Configurations)	relationships between different variables (speed of light, wavelength, frequency, energy) • Solve for an unknown variable in the speed of light equation • Solve for an unknown variable in Planck's equation • Read an article and answer questions explain real world and particle view ways in which light is produced **6.A** Use mathematical thinking to support the relationships between the speed of light, frequency, wavelength to determine the amount of energy and color of light produced. **6.B** Construct explanations for macroscopic and microscopic levels to describe electromagnetic radiation and the cause and effect of how light is produced instead of other energy types, such as heat.	
Performance Task Lesson 7: Why do fireworks produce different colors of light? (1 block)	Lesson 7 Teacher Slides L… 1. Flame Test Lab a. **x 1.5** in Powerschool	**Learning Target:** Conduct an experiment to determine the unknown element in the sample and use evidence from calculations, orbital diagrams,	Using a new phenomenon related to light, students put together what they have learned about electron behavior and light to fireworks. Students test

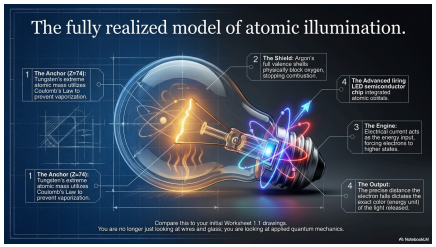
		and knowledge of chemistry to support the determination of the unknown element **Success Criteria:** I will… ● Conduct an experiment ● Identify the unknown element ● Complete an orbital diagram and electron configuration of an element ● Calculate frequency and energy of the color of light of the unknown metal ● Write a CER to support the identification of your unknown metal ● VoG: Collaboration & Critical Thinking ○ Cooperation ○ Constructing Arguments **7.A** Use the periodic table as a model to illustrate orbital diagrams and write longhand and shorthand electron configurations of ground states and excited states of elements to support patterns in electron arrangement of elements in fireworks.	multiple different metals to observe the light that is produced. Students rely on their ability to use orbital diagrams, electron configurations, electron energy, and mathematics to describe the fireworks phenomenon. Students may be wondering why some elements reacted faster in the flame than others.

		7.B Use mathematical thinking to support the relationships between the speed of light, frequency, wavelength to determine the amount of energy produced in the unknown metal.	
Lesson 8: Common Assessment Lesson 8 Teacher Slides Light Bulb **Illuminating Matter, Quiz # 2 (Similar to Previous) [Needs more versions]** **2 blocks, including review** **Review Options:** 1. **Study Guide & Practice:** **[As Stations] [As Worksheet] (60-75 min.)** 2. Electron Configuration Bingo		**Learning Target**: Use mathematics to determine the amount of subatomic particles in an atom and solve for and support mathematical relationships between energy, frequency, and wavelength and apply to different colors. **Learning Target**: Use the periodic table to complete orbital diagrams and electron configurations of different atoms. **Success Criteria**: ● Determine the number of subatomic particles of an atom ● Solve with the speed of light and Planck's equations to determine frequency, wavelength and/or energy from a given quantity ● Explain and analyze with the mathematical relationships between energy, frequency, and wavelength ● Describe electron behavior and its relationship to light emission or absorption ● Complete orbital diagrams of atoms using the periodic table ● Complete electron configurations of atoms using the periodic table ● VoG: Critical Thinking ○ Interpretation & Analysis ○ Reasoning ○ Problem Solving/Solution Finding	

		8.A Use mathematics to determine the amount of subatomic particles in an atom by identifying patterns among the elements **8.B** Use the periodic table as a model to determine orbital diagrams and electron configurations of different atoms by identifying electron patterns on the periodic table. **8.C** Use mathematics and computational thinking to solve for an unknown variable in the speed of light and Planck's equation to support mathematical patterns of energy, frequency, and wavelength to apply to colors.	
Learning Sequence 3: Why do some elements react more than others and why is that important for designing and choosing materials for a light bulb?			
Lesson 9: Why are some elements more reactive than others and which ones would be best in a lightbulb? (3.5 blocks)  	Lesson 9 Teacher Slides L… 1. Coulombic Attraction POGIL a. Simulation 2. Periodic Trends POGIL (At. Radius, Ionization Energy and Electronegativity) a. Answers b. Periodic Trends I (At. Radius, Ionization Energy and Ionic Radius) c. Periodic Trends II (Electron Affinity) **Supporting Review Optional Activities:**	**Learning Target:** Use Coulomb's Law to explain multiple trends observed on the periodic table going across periods and down groups to describe potential reactivity of the elements. **Success Criteria**: ● Provide reasoning for the periodic trends using Coulombic Attraction **Reasoning:** ○ Electron shielding effect ○ Effective Nuclear Charge **Trends:** ○ Atomic radius ○ Electronegativity/	Students learn that the number of valence electrons determine the basic reactivity of elements. They learn that metals lose electrons while nonmetals gain electrons when reacting; however, noble gases have a full outer shell of valence electrons and do not react. The reason why this happens is due to the periodic trends of the elements. Tungsten has a very high melting point and glows, producing light when heated. Gas inside the lightbulb needs to be stable so it should not react, meaning a noble gas like Argon would be great to use in a lightbulb due to it not reacting with the Tungsten.

	1. Periodic Trends Webquest 2. Periodic Trends Worksheet a. Key 3. Periodic Trends Task Cards 4. Periodic Trends Activity Card Sort 5. Periodic Trends Summary Chart 6. Mastering Periodic trends summary chart 7. Alien Periodic Trends (Thinking Question) Optional Extension (1 Extra Block) 1. Periodic Trends and Reactivity Lab **Textbook Reference:** 1. 3.5 Periodic Variations in Element Properties	electron affinity ○ First ionization energy **9.A** Construct an explanation using Coulomb's Law for the trends on the periodic table by noticing patterns across periods and down groups to describe simple reactivity of elements.	In terms of the periodic trends, to support this, students learn that Coulombic attraction explains these trends on the periodic table due to the proton pulling power across a period and the number of energy levels where the outermost electrons are found going down a group. The more energy levels, the higher the shielding effect. Students use this information to support: ● Atomic radius ● Electronegativity/electron affinity ● First ionization energy Now that students have learned the components of the lightbulb and why they work, they may be wondering why over time lightbulbs “blow out”.
Performance Task Lesson 10: Why is tungsten the best filament material, and how could we design an even better light bulb? (.5 block)	Lesson 10 Teacher Slides … Designing the Best Light bulb Filament ● Collaborative assignment (partners)	**Learning Target:** Construct an explanation and design a solution by using periodic trends to explain why tungsten is used as a filament and find a new metal that can be used as a filament.	Students are able to explain why tungsten is the best filament material. Using the periodic table and trends, students are able to identify that tungsten is less likely to react due to its ionization energy and

	• Each student turns in their own packet When designing a new light bulb, students will choose a new metal by using the periodic table only and their knowledge of trends. Some of these may include the following: • Molybdenum • Chromium • Rhenium • Tantalum • Osmium Less sophisticated answers include the following: • Iron • Nickel • Titanium	**Success Criteria**: I will… • Use the periodic table to predict properties of elements. • Compare melting points and explain why they matter. • Analyze ionization energy, electronegativity, and atomic radius. • Use evidence to justify an engineering decision. • VoG: Collaboration & Creativity ○ Cooperation ○ Creative Production & Innovation **10.A** Construct an explanation and design a solution by using the periodic trends and atomic properties to determine why tungsten is the best filament material and choosing another metal that can perform better as a filament in the light bulb.	electronegativity values. This element can conduct electricity and has a high melting point. Based on their understanding of the trends of the periodic table, students choose another metallic element that could be used as a filament in a light bulb.
Lesson 11: How has understanding atomic structure revolutionized lighting technology? (1 block)	Lesson 11 Teacher Slides … 1. The Quantum Revolution of Lighting Supporting Article	**Learning Target:** Apply Coulomb's Law, periodic trends, and knowledge of electron transitions to explain the evolution of lightbulbs, including the chemical prevention of oxidation and energy efficiency.	Students learn that current scientists are using the quantum model to produce certain light colors. The number of protons and electrons are important when considering the element of choice to produce certain colors

	1. Chem Matters - From Blue to Bright	**Success Criteria**: I will… • Use Coulomb's Law and periodic trends to relate to the development of more efficient light bulbs • Complete energy transition calculations to gain a better understanding of what it means for a light bulb to be energy efficient **11.A** Use the periodic table to apply periodic trends, Coulomb's law, and electron transitions to build on the structure and function of different types of light bulbs **11.B** Use mathematics and computational thinking to gain an understanding of what it means to be energy efficient based on the structure and function of different light bulbs	of light. They get a mathematical understanding of energy efficiency through their calculations to see that early light bulbs were not nearly as energy efficient as today's LED light bulbs. Over time as scientists understood atomic structure and the quantum model of the atom, they were able to produce energy efficient light by understanding electrons, energy, light, and periodic trends.
Interim Assessment Chemistry - **Structure and Properties of Matter PS 4-1**			
Lesson 12 Teacher Slides Light Bulb **Review: [As Stations] [As Worksheet] (75-90 min.)[Answer Key]** **Lesson 12: Common Assessment (60-80 min.)** **[Version B] [Version C]**		**Learning Target**: Construct an explanation using Coulomb's Law to support periodic trends and reactivity for main group elements by observing patterns on the periodic table or using data provided **Success Criteria**: • Use Coulomb's Law to describe the trends on the periodic table	

2 blocks including Review	• Use trends on the periodic table to support reactivity for main group elements
	• VoG: Critical Thinking
	  ○ Interpretation & Analysis
	  ○ Reasoning
	  ○ Problem Solving/Solution Finding
	
	12.A Construct an explanation using Coulomb's Law to support the periodic trends on the periodic table in terms of reactivity for main group elements by observing patterns and trends through data or utilizing the periodic table.

Illuminating Matter



Accelerated General Chemistry
Unit 1
Written by Lisa Daigle & Rich Niro
Presentation Created by Lisa Daigle
October 21, 2026

Unit 1: Illuminating Matter



Students figure out how a light bulb works by learning about atoms, subatomic particles, and electron behavior. Students learn that the electron produces what we see as light and mathematically calculate the energy required to see certain colors using Planck's equation which expands upon their understanding of the relationship between wavelength and frequency. Using periodic trends and reactivity, students understand why tungsten and argon are used in lightbulbs to get them to work and produce light.

The Standards

HS-PS1-1

Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

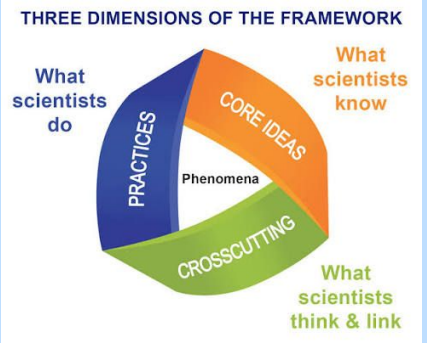
HS-PS1-2

Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

HS-PS4-1

Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

SEPs, DCIs, & CCCs



Science & Engineering Practices

- Developing and Using Models
- Constructing Explanations and Designing Solutions
- Using Mathematics and Computational Thinking

Disciplinary Core Ideas

- PS1.A: Structure and Properties of Matter
- PS1.B: Chemical Reactions
- PS4.A: Wave Properties

Crosscutting Concepts

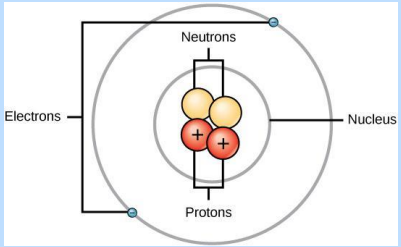
- Patterns
- Cause & Effect

Learning Sequence 1: Why do some elements produce light in incandescent light bulbs but others can't?

What makes something glow, and why did early inventors struggle to create practical light bulbs?

How does the arrangement of atoms and electrons determine what materials can produce light?

Develop a model to show how light bulbs work at the subatomic level to produce light by identifying patterns in the data provided about how they work.



Use the periodic table as a model to predict properties of elements by defining patterns in the different families of the periodic table.

Use mathematical thinking to solve for the average atomic mass to describe the decimal seen on the periodic table.

Use the Bohr model to illustrate the subatomic particles in an atom and recognize patterns of subatomic particle placement in different materials when building or drawing these models.

Assessment

Periodic Table Basics Assessment

Use and interpret models, tables, and graphs to predict properties of elements by identifying patterns on the periodic table or diagrams provided.

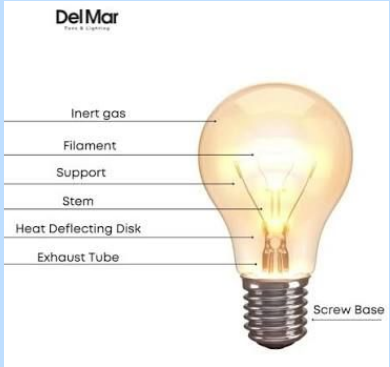
Use mathematics and computational thinking to calculate subatomic particles or average atomic mass by using the patterns on the periodic table or natural abundance of isotopes.



- Interpretation & Analysis
- Reasoning
- Problem Solving/Solution Finding

What students figure out

- Tungsten (W) is a transition metal and has a high melting point
- W has a unique amount of protons, which is what identifies the element
- W would have a really big Bohr model because in a neutral atom, it has a whopping 74!
- Noble gases are unreactive because they have a full outer shell of electrons, so it won't react with the tungsten inside of the bulb.



Learning Sequence 2: How do light bulbs produce light and how do some types of light bulbs produce different colors of light?

How do electrons moving between energy levels produce light?

Use the periodic table as a model to illustrate orbital diagrams and write longhand and shorthand electron configurations of ground states and excited states of elements to support patterns in electron arrangement of elements on the periodic table.

Why do light bulbs produce light?

Use the Bohr model and computer simulation to help predict patterns in electron behavior to understand the conceptual mathematical relationships between wavelength and frequency to discover patterns with different colors of light produced.

Analyze and interpret spectral graphs and apply electron behavior to evaluate emissions patterns of various light production technologies.

Update the initial model to describe electron behavior to show how wavelength and frequency are related for light bulbs to produce the traditional yellow light.

Learning Sequence 2: How do light bulbs produce light and how do some types of light bulbs produce different colors of light?

How do wavelength, frequency, and energy help us understand the behavior of light?

Use mathematical thinking to support the relationships between the speed of light, frequency, wavelength to determine the amount of energy and color of light produced.

Construct explanations for macroscopic and microscopic levels to describe electromagnetic radiation and the cause and effect of how light is produced instead of other energy types, such as heat.

$E=h\upsilon$ $\quad E = \frac{hc}{\lambda}$

$h = 6.626 \times 10^{-34}$ J·s

$c = 3.0 \times 10^{8}$ m/s

Performance Task & Assessment

Flame Test Lab!

Use the periodic table as a model to illustrate orbital diagrams and write longhand and shorthand electron configurations of ground states and excited states of elements to support patterns in electron arrangement of elements in fireworks.

Use mathematical thinking to support the relationships between the speed of light, frequency, wavelength to determine the amount of energy produced in the unknown metal.

Electron Behavior & Light Assessment

Use mathematics to determine the amount of subatomic particles in an atom by identifying patterns among the elements

Use the periodic table as a model to determine orbital diagrams and electron configurations of different atoms by identifying electron patterns on the periodic table.

Use mathematics and computational thinking to solve for an unknown variable in the speed of light and Planck's equation to support mathematical patterns of energy, frequency, and wavelength to apply to colors.

Performance Task & Assessment

Flame Test Lab!





- Cooperation
- Constructing Arguments

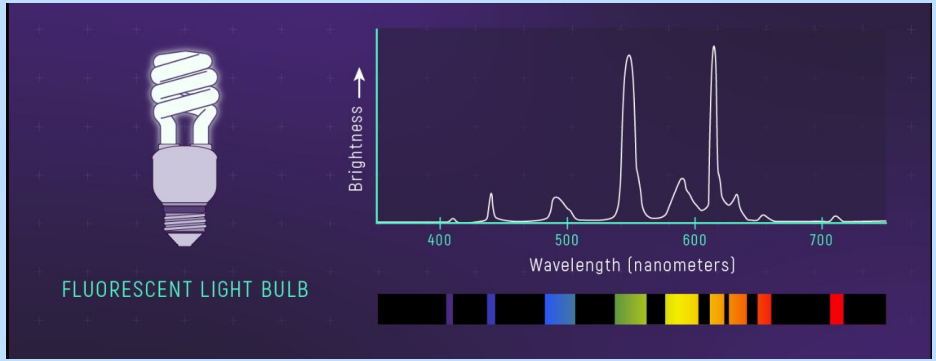
Electron Behavior & Light Assessment



- Interpretation & Analysis
- Reasoning
- Problem Solving/Solution Finding

What students figure out

- Electrons in atoms can get excited when energy is applied which makes them absorb the energy then release it- the energy we see is light
- Elements have unique electron configurations according to the quantum model (Bohr models are an older model).
- Each light produced has its own unique amount of energy, wavelength, and frequency.
- The light we see from light bulbs has a unique spectra of light.



Learning Sequence 3: Why do some elements react more than others and why is that important for designing and choosing materials for a light bulb?

Why are some elements more reactive than others and which ones would be best in a lightbulb?

How has understanding atomic structure revolutionized lighting technology?

Construct an explanation using Coulomb's Law for the trends on the periodic table by noticing patterns across periods and down groups to describe simple reactivity of elements.

Use the periodic table to apply periodic trends, Coulomb's law, and electron transitions to build on the structure and function of different types of light bulbs

Use mathematics and computational thinking to gain an understanding of what it means to be energy efficient based on the structure and function of different light bulbs

Performance Task & Assessment

Designing the Best Light Bulb Filament



- Cooperation
- Creative Production & Innovation

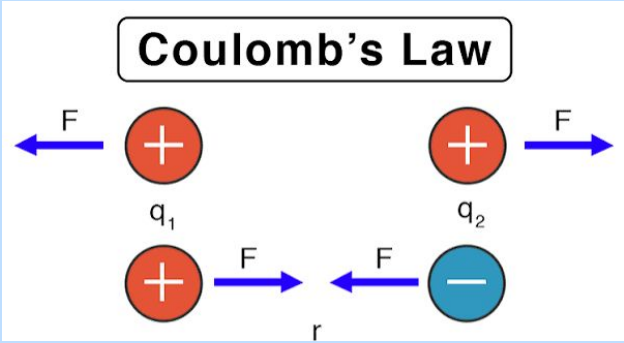
Electron Behavior & Light Assessment



- Interpretation & Analysis
- Reasoning
- Problem Solving/Solution Finding

What students figure out

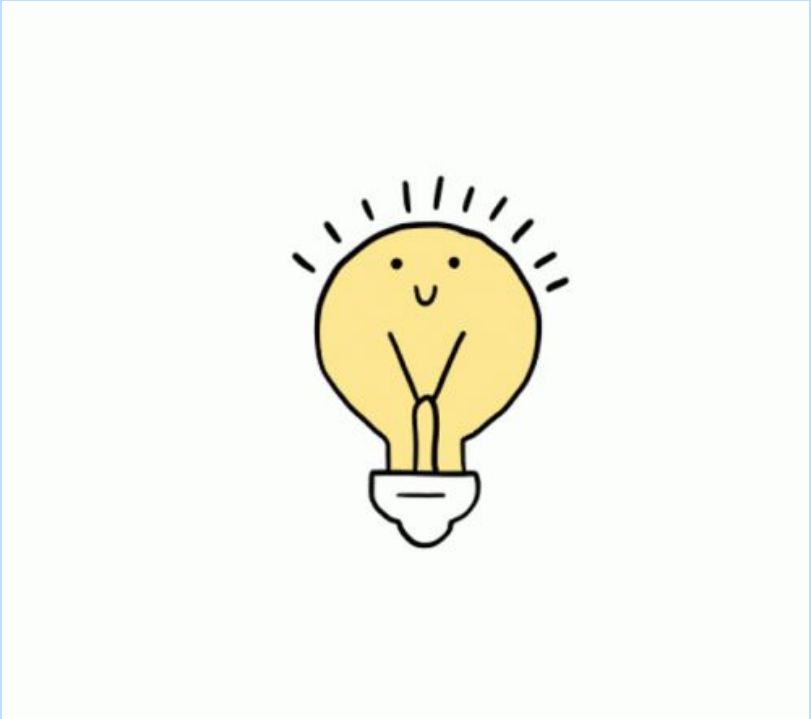
- Students learn that Coulombic attraction between the protons and valence electrons play a crucial role in reactivity.
  - Effective Nuclear Charge
  - Electron Shielding Effect
- They get a mathematical understanding of energy efficiency through their calculations to see that early light bulbs were not nearly as energy efficient as today's LED light bulbs.



Thank you!

Accelerated General Chemistry

Illuminating Matter



BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** **November 19, 2026**

Decision Requested **X** **Agenda Code** **10 d.**

AGENDA REPORTING FORM

Agenda Topic: SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACC- Revised - Second Reading.

Summary of Issue: The Curriculum & Instruction Committee has reviewed the SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACC- Revised.

Background: _____

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Move that the Board of Education approve the SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACC- Revised – as presented by the Curriculum & Instruction Committee.

Titles of Attachments:

1. Course Proposal

Christina L. Blatin
Signature of Staff Member Submitting Report

Peter Madaras
Signature of Superintendent of Schools

Unit Overview	
Unit Title:	ES: Astronomy - Guest Stars and the Big Bang ACC
Teacher:	Kelsey Duffy and Nicole Raccio
Grade Level/Course:	9 Earth Science
Length/Dates:	10 weeks
Unit Summary:	This unit is anchored in historical observations of stars that suddenly appeared and then disappeared within a short period of time. These phenomena prompt students to question why most stars seem constant while others change so dramatically. From this, students begin to wonder what causes stars to shine and what processes might lead to such rapid changes. Students organize their questions around key ideas of matter, energy, and forces, and decide to investigate the regions of the sky where these events were recorded using modern astronomical tools. In Lesson Set 1 (Lessons 2–5), students analyze images and spectral data from the remnants of these events. They then develop and pursue research questions in small groups, ultimately coming together in Lesson 5 to build a shared understanding of nuclear fusion and the life cycles of stars.Throughout the unit, students engage in structured research supported by scaffolded tools introduced over time, including the Planning for Obtaining Information Tool, the Obtaining Information Tool, and the Evaluating Sources of Information Tool. Building off these curricula, combined: Astronomy Skeleton Updated 2019 Astronomy Skeleton- Stars & the Big Bang OpenSciEd Unit P.6 Stars & the Big Bang OpenSciEd Unit P.5 Electromagnetic Radiation

Performance Expectations
• **HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation.** • **HS-ESS1-2 Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.** • **HS-ESS1-3 Communicate scientific ideas about the way stars, over their life cycle, produce elements.** • **HS-PS1-8 Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes ~~of fission~~, fusion,~~ and radioactive decay~~.**

- **HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media**
  - **HS-PS4-4 Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.**
  - **HS-PS4-5 Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.***
  - HS-PS4-3 Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.

Essential Questions:

1. How can Electromagnetic Radiation help us understand why some stars remain stable while others change?
2. How Do Stars Produce Energy and Matter?
3. How can we use our knowledge of Guest stars as supporting evidence of the Big Bang?

Unit's Essential Question-Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away?

Lesson Level Essential Questions:

Learning Sequence 1: Energy from Stars

- 1.a: Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away?
- 1.b: How does energy transfer through a wave?
- 1.c: What other types of EM radiation are there, and how do we use them?
- 1.d: Does all electromagnetic radiation cause damage? Wave/Particle Duality
- 1.e: Should we send astronauts into space?

Learning Sequence 2: Matter and Forces within Stars

- 2.a: How does the matter in guest stars compare to stable stars?
- 2.b: What new questions can we ask about stable and unstable stars?
- 3: What is happening with matter and energy in stable stars, like our Sun, and how does this help us understand guest stars?
- 4: How does running out of fuel cause a star to change?
- 5: Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away?

Learning Sequence 3: Stars and the Big Bang

- 6: How has the matter in the Universe changed over time, and how do we know?
- 7: How can we use the practices and crosscutting concepts we have developed to figure things out on our own?

Science and Engineering Practices (Skills)	Disciplinary Core Ideas (Knowledge)	Crosscutting Concepts (Enduring Understandings)
Using Mathematics and Computational Thinking Mathematical and computational thinking at the 9-12 level builds on K-8 and progresses to using algebraic thinking and analysis; a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms; and computational tools for statistical analysis to analyze, represent and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions. ● Use mathematical representations of phenomena or design solutions to describe and/or support claims and/or explanations. **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 9–12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs. ● Communicate scientific ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically). ● Evaluate the validity and reliability of multiple claims that appear in scientific and technical texts or media reports, verifying the data when possible. ● Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.	**PS4.A: Wave Properties** ● The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the type of wave and the medium through which it is passing. **PS4.B: Electromagnetic Radiation** ● Atoms of each element emit and absorb characteristic frequencies of light. These characteristics allow identification of the presence of an element, even in microscopic quantities. (secondary) ● When light or longer wavelength electromagnetic radiation is absorbed in matter, it is generally converted into thermal energy (heat). Shorter wavelength electromagnetic radiation (ultraviolet, X-rays, gamma rays) can ionize atoms and cause damage to living cells. ○ Electromagnetic radiation (e.g., radio, microwaves, light) can be modeled as a wave of changing electric and magnetic fields or as particles called photons. The wave model is useful for explaining many features of electromagnetic radiation,	**Cause and Effect** ● Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. ● Cause and effect relationships can be suggested and predicted for complex natural and human-designed systems by examining what is known about smaller scale mechanisms within the system. **Scale, Proportion, and Quantity** ● The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs. **Energy and Matter** ● In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved. ● Energy cannot be created or destroyed–only moved between one place and another place, between objects and/or fields, or between systems.

Developing and Using Models Modeling in 9–12 builds on K–8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed world(s). ● Develop a model based on evidence to illustrate the relationships between systems or between components of a System. **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories. ● Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	and the particle model explains other features **PS3.D: Energy in Chemical Processes and Everyday Life** ● Nuclear fusion processes in the center of the sun release the energy that ultimately reaches Earth as radiation. (secondary) **ESS1.A: The Universe and Its Stars** ● The star called the sun is changing and will burn out over a lifespan of approximately 10 billion years. ● The study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements, and their distances from Earth. ● Other than the hydrogen and helium formed at the time of the Big Bang, nuclear fusion within stars produces all atomic nuclei lighter than and including iron, and the process releases electromagnetic energy. Heavier elements are produced when certain massive stars achieve a supernova and explode ● The Big Bang theory is supported by observations of distant galaxies receding from our own, of the measured composition of stars and nonstellar gases, and of the maps of spectra of the primordial radiation (cosmic microwave background) that still fills the universe.	

	PS1.C: Nuclear Processes ● Nuclear processes, including fusion, fission, and radioactive decays of unstable nuclei, involve release or absorption of energy. The total number of neutrons plus protons does not change in any nuclear process.	

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).
Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.
C District Rubrics

Performance Assessment(s) and Evaluative Criteria:

1. LS1 Common Assessment: Part 1: Properties of Light Transfer Task: Students use properties of electromagnetic waves (wavelength, frequency, and speed) and patterns in data (optical density) to *effectively communicate* how light behaves in different materials and evaluate scientific claims about electromagnetic radiation. **HS-PS4-1; ; VoG: Communication**
   Success Criteria:
   - calculate the speed of a wave using wavelength and frequency with correct units.
   - compare different types of electromagnetic waves using wavelength and frequency.
   - explain how and why the speed of light changes when it enters different materials.
   - construct a scientific explanation (claim, evidence, reasoning) based on data
2. LS1 Common Assessment: Part 2: Evaluating 5G Safety Transfer Task: Students can *critically think by* evaluating arguments about the dangers of 5G radiation. **HS-PS4-4, VoG: Critical Thinking**
   Success Criteria:
   - identify the claim
   - identify the evidence being used to support each of the author's claims

- Identify the author's reasoning or explanation of the evidence.
- consider the validity of the evidence provided by each claim in the social media post

3. LS2 Common Assessment: Algol Transfer Task: Students can *critically think* about evidence and models to explain how fusion changes matter in stars and how those changes can be used to determine a star's age. HS-ESS1-3, HS-PS1-8 ; **VoG: Critical Thinking**

   Success Criteria:
   - analyze data about star composition, fusion reactions, and energy production.
   - develop and use models to explain how elements are formed through nuclear fusion.
   - use evidence to make and support a claim about the relative ages of stars.
4. LS2 Common Assessment: Students can construct a model to *effectively communicate* how feedback loops keep stars stable, and how disruptions in these loops can cause sudden dramatic changes depending on a star's mass.. HS-ESS1-1, **VoG: Communication**

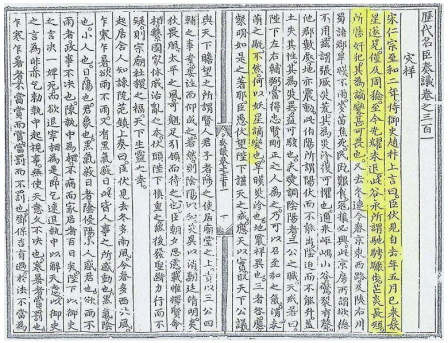
   Success Criteria:
   - create and update models of stellar systems based on evidence from multiple sources.
   - describe how feedback loops regulate matter, energy, and forces within stars.
   - explain how the mass of a star affects its stability and response to disruptions.
   - illustrate how changes in these loops can lead to sudden, catastrophic events.
   - support my explanations with evidence from data, simulations, or observations of real stars.
5. LS3 Common Assessment: Jupiter Transfer Task: Students will ask meaningful scientific questions about real-world phenomena and plan how to find, evaluate, and share information to answer them using the science and engineering practices I've learned. HS-ESS1-1

   Success Criteria:
   - reflect on my own life experiences to identify puzzling phenomena I want to explain.
   - ask testable and relevant questions that connect to ideas from this course.
   - plan how to obtain and evaluate information to investigate my questions.
   - decide how to communicate my findings clearly using scientific reasoning and evidence.
   - apply the science and engineering practices and crosscutting concepts I've developed throughout this and other units.

Target Question	Activity	Standard Objectives/Learning Target	Student will know and wonder
Learning Sequence 1: Energy from Stars **Class Notes - LS1: Stars: Electromagnetic Radiation (ES)- Duffy**			
Lesson 1.a: Why do some stars seem unchanging, while others	**P.6 Lesson 1 Teacher Edition**	**Learning Target:** I can create and use models to explain why most	Why do some stars seem unchanging, while others appear

appear briefly, change dramatically, and fade away?

Lesson 1 - P.6 Stars & the B…


宋仁宗至和二年待御史趙抃言去年五月己亥夜

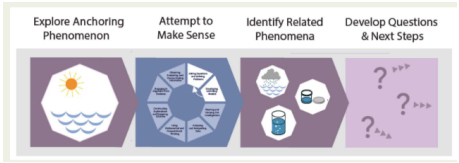


Duffy combined handout version of Lesson 1:

Handout Historical Guest St…

-INTRODUCE A NEW PHENOMENON
common "guest stars" in ancient cultures' recordings

Engage in the Anchoring Phenomena Routine



Explore Anchoring Phenomena: Introduce Guest Star 1054 slides A-S and/or

-READ ABOUT OTHER GUEST STARS

P.6 Lesson 1 Handout Histor…

Attempting to Make Sense: Students will create a notice and wonder chart in their notebook about the guest star.

-DISCUSS IN JIGSAW GROUPS

#1 Handout Historical Guest…
#2 Handout Historical Guest…
#3 Handout Historical Guest…
#4 Handout Historical Guest…

-1987 GUEST STAR DEEP DIVE

stars we see in the night sky appear stable over time, while some "guest stars" change suddenly and dramatically.

Success Criteria: I will…

- develop a system model that shows the parts and processes of a star (matter, energy, and forces).
- use my model to explain why most stars appear constant in brightness and position over long periods.
- ask scientific questions based on historical observations of stars that changed in brightness, shape, or color, and use those questions to improve and clarify models of how stars change over time.

1.A Develop system models (or sets of models) to explain why the stars we see at night appear stable over time, while historical accounts of guest stars describe them changing dramatically. (SEP: 2.3; CCC: 7.1; DCI: ESS1.A.1)

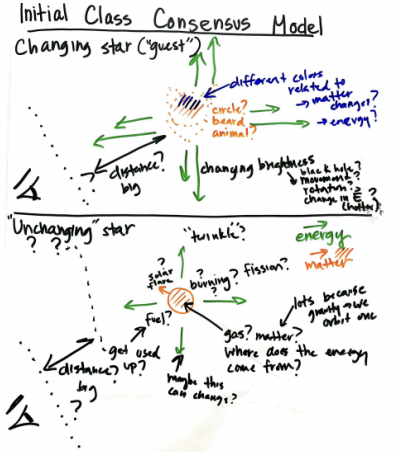
1.B Ask questions that arise from historical observations of dramatic

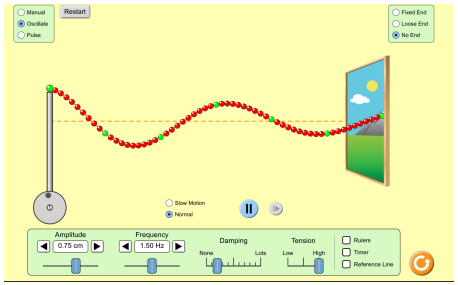
briefly, change dramatically, and fade away? We examine historical evidence that some stars appear in the night sky even though we could not see a star there previously. The star fades away and seems to disappear. We map these events on a star map and look for patterns. We figure out: A guest star is a star that appears and then seems to disappear a short time later. Guest stars are distributed across the sky but seem to be concentrated along the plane of our galaxy (the Milky Way).

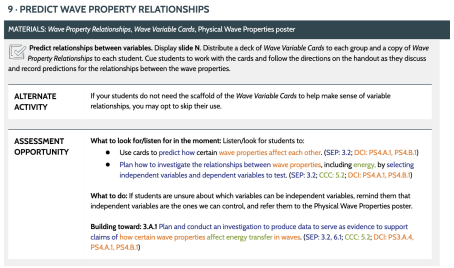
What students will figure out:

- A guest star is a star that appears and then seems to disappear a short time later.
- Guest stars are distributed across the sky but seem to be concentrated along the plane of our galaxy (the Milky Way).

What's next?
Since students asked questions about the energy released by the guest star they will examine how energy moves away from stars to provide us information about the guest star.

	Driving Questions and Next Steps Students will develop a model of a change and unchange star and develop questions about their models as well as the historical information. **-INDIVIDUAL MODELING** **-DEVELOP INITIAL CONSENSUS MODEL**  **-BUILD THE DQB**	changes in the brightness, shape, and color of stars to clarify our models, and seek additional information. (SEP: 1.1, 1.4; CCC: 7.1; DCI: ESS1.A.2)	
Lesson 1.b: How does energy transfer through a wave? **Lesson 3 - P.5 Electromagn…**	**P.5 Lesson 3 Teacher Edition** **Lesson Summary:** **Engage:** What is given off by the supernova? Teacher slides template: **How does energy travel?**	**Learning Target:** I can plan and conduct an investigation to make claims about how certain wave properties affect energy transfer in waves **Success Criteria:** I will..	We recall examples of physical waves. We produce waves with a spring. We develop a model for how physical waves transfer energy through solids. We use a computer simulation to plan and carry out four investigations. Using our results, we make claims about how various wave properties affect





9 · PREDICT WAVE PROPERTY RELATIONSHIPS

MATERIALS: *Wave Property Relationships*, *Wave Variable Cards*, Physical Wave Properties poster

Predict relationships between variables. Display **slide N**. Distribute a deck of *Wave Variable Cards* to each group and a copy of *Wave Property Relationships* to each student. Cue students to work with the cards and follow the directions on the handout as they discuss and record predictions for the relationships between the wave properties.

ALTERNATE ACTIVITY

If your students do not need the scaffold of the *Wave Variable Cards* to help make sense of variable relationships, you may opt to skip their use.

ASSESSMENT OPPORTUNITY

What to look for/listen for in the moment: Listen/look for students to:

- Use cards to predict how certain wave properties affect each other. (SEP: 3.2; DCI: PS4.A.1, PS4.B.1)
- Plan how to investigate the relationships between wave properties, including energy, by selecting independent variables and dependent variables to test. (SEP: 3.2; CCC: 5.2; DCI: PS4.A.1, PS4.B.1)

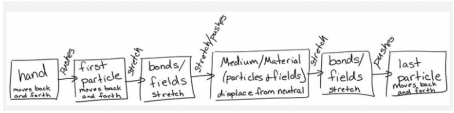
What to do: If students are unsure about which variables can be independent variables, remind them that independent variables are the ones we can control, and refer them to the Physical Wave Properties poster.

Building toward: 3.A.1 Plan and conduct an investigation to produce data to serve as evidence to support claims of how certain wave properties affect energy transfer in waves. (SEP: 3.2, 6.1; CCC: 5.2; DCI: PS3.A.4, PS4.A.1, PS4.B.1)

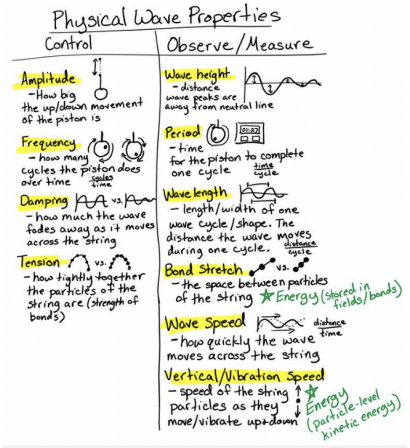
Explore/Explain (class share out after each section)

How are the properties/char…

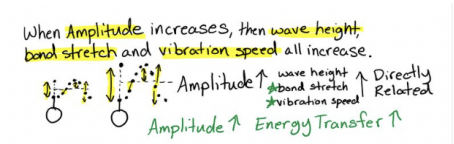
Part I: How does energy travel?

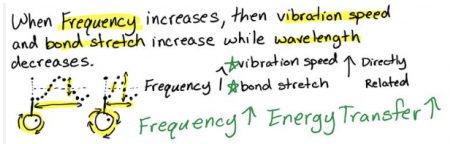


Part 2: What are the characteristics of this moving energy?



Part 3: How are these properties related to frequency and amplitude?





- establish and model how energy is transferred into the system
- identify and select independent variables and dependent variables to test to investigate the relationships between wave properties, including energy.
- plan and conduct an investigation to produce data to serve as evidence to support claims of how certain wave properties (amplitude and frequency) affect energy transfer in waves.

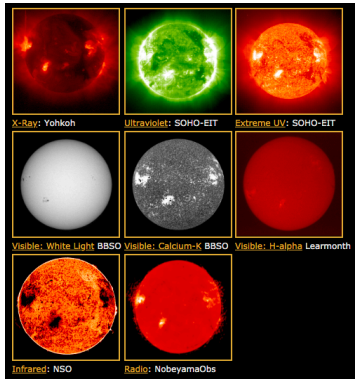
3.A Plan and conduct an investigation to produce data to serve as evidence to support claims about how certain wave properties affect energy transfer in waves. (SEP: 3.2, 6.1; CCC: 5.2; DCI: PS3.A.4, PS4.A.1, PS4.B.1)

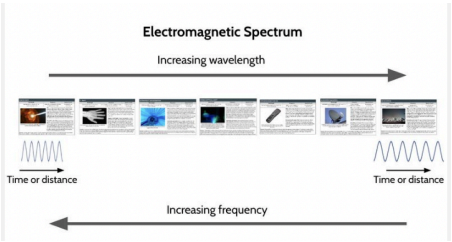
3.B Use algebraic techniques to develop a mathematical model to identify and test the relationship between frequency, wave speed, and wavelength. (SEP: 5.3; CCC: 1.4; DCI: PS4.A.1)

energy transfer. We develop a mathematical model of the relationship between frequency, wave speed, and wavelength.

What students will figure out:

- When the first particle in the wave on a string is moved (as a force is applied to it, which transfers energy to it), it stretches the electric field (bond) between it and the next particle.
- When a bond is stretched (or compressed), energy is transferred to the fields that produce the bond, and when it is unstretched (or uncompressed), that energy transfers out of the fields and back into the motion of the particles around it.
- A larger amplitude means that the electric fields (bonds) between particles will be stretched farther in either direction in a given amount of time (period); this increase in vibration speed transfers more energy along the wave.
- A larger frequency means that the bonds will be

	Evaluate:(Student responses to claim questions) **Making Claims about Energ…** Lesson 3 Exit Ticket (built in canvas called "Waves Check-in (Mini Transfer Task") ***Use the simulation to derive the formula***	**Learning Target:** I can analyze and interpret wavelength, frequency and energy data of the EM spectrum to calculate the speed of light. **Success Criteria:** I will… • identify (numerical and graphical) relationships between wavelength, frequency, energy • calculate the speed of light waves using the relationship between frequency and wavelength. • analyze speed of light in various materials	stretched back and forth more times per second; this increase in vibration speed transfers more energy along the wave. • The wavelength of a wave can be determined by the wave speed across the medium and its frequency. **What is next?** The students will go back to the driving question board to identify all the questions related to energy and realize that stars can give off energy that we can not see. The students will next explore all times of light energy coming from stars.
Lesson 1.c: What other types of EM radiation are there, and how do we use them? **Lesson 9 - P.5 Electromagn…**  	**P.5 Lesson 9 Teacher Edition** **Engage:** What type of energy is given off by the sun? Is it dangerous? Hubble images (or one to the left) Chandra - RCW 103 **Explore/Explain:** (How do we categorize the EM radiations from the sun? Is the EM radiation released by the sun dangerous?) • **Raccio Electromagne…**	**Learning Target:** I can develop an argument about why EM radiation can be harmful based on its frequency, wavelength, and interactions with matter. **Success Criteria:** I will.. • organize electromagnetic (EM) radiation energy by its physical properties • write a definition of the EM spectrum • obtain and evaluate information about how the	We examine the remaining categories of questions on the Driving Question Board. We explore various types of EM radiation and construct the EM spectrum based on their wavelength and frequency. We write an argument about the relationship between the frequency and wavelength of EM radiation and its interactions with matter, and how this relationship helps explain some of the uses of EM radiation. We add new

	• **EM card sort - slides…**  **Evaluate:** Why do we think some forms of high-frequency EM radiation (ultraviolet, X-rays, and gamma rays) would cause more damage than others? OR Is the radiation from the sun dangerous? **EM Radiation Applications - …**	interactions with matter of EM radiation determines its use **9.A** Develop an argument about why EM radiation can be used in multiple technologies to do specific tasks based on its frequency, wavelength, and interactions with matter. (SEP: 7.4; CCC: 4.1; DCI: PS4.B.2, PS4.C.1) **9.B** Ask questions that arise from examining a model of the electromagnetic spectrum related to the uses and material interactions of different types of electromagnetic radiation. (SEP: 1.2; CCC: 4.1; DCI: PS4.B.2, PS4.C.1)	questions to the DQB and decide to examine why some types of EM radiation can harm living organisms and others do not. **What students will figure out:** • EM radiation with high frequencies has short wavelengths; EM radiation with low frequencies has long wavelengths. • The EM radiation spectrum is arranged from high- to low-frequency EM waves. • Different types of EM radiation have different interactions with matter, including heating it, ionizing it, or breaking apart its molecules. • These interactions can be harnessed for various applications, such as medical imaging, telecommunications, and energy production. • Ionizing radiation can harm living organisms. ***What's next?*** *We will sort cards and identify the wave properties that better characterize harmful EM radiation. We will use various data sources to identify the pattern of increased*

			frequency and increased cancer risk. We will analyze a wave model and a photon model of EM radiation and determine that the photon model better explains our evidence.
Lesson 1.d: Does all electromagnetic radiation cause damage? Wave/Particle Duality **Lesson 10 - P.5 Electromag…**	**P.5 Lesson 10 Teacher Edition** **Lesson Teacher Resources:** **P.5 Lesson 10 Slides** **Engage:** Pull out the EM cards that cause the most harm. What do they have in common? Followed by slinky demonstration of high energy waves. **Explore:** jigsaw reading to complete table/Show video on slide with solar cell and demo solar cell in class **Amplitude/Frequency Effects…** **Amplitude Frequency Evide…** **Explain:** Which causes greater changes in matter (humans and/or solar cells): high amplitude or high frequency? What evidence do we have from class to support your answer? Does this align with our	**Learning Target:** I can develop an argument about why EM radiation can be harmful based supported by data. **Success Criteria:** I will… • read articles and categorize information based on low-amplitude vs high-amplitude for various frequencies • collect data on how various frequencies and amplitudes affect solar cells. • evaluate the merits of the wave and photon models of light to determine which reasoning better explains how high-frequency EM radiation can cause ionization of atoms and emission of electrons from a solar cell • create an analogy for the photon model of light	We sort cards to identify the wave properties that characterize harmful EM radiation. We use various data sources to identify the pattern of increased frequency and increased cancer risk. We use a water wave analogy to explain this pattern but find the wave model insufficient. We analyze a photon model, develop our own analogies of the model, and compare the model with our evidence. We determine that the photon model better explains this behavior of EM radiation. **What students will figure out:** • Some radiation is ionizing and some radiation is not. • The photons of high-frequency EM radiation have enough energy to knock out electrons of atoms and molecules, turning them into ions with different chemical properties.

	wave model of light? **Elaborate:** Introduce the Photon Model of Light **Evaluate** **Photon Model Analogy** **Past examples:** **1A - Our Photon Model Anal…** **2A - Our Photon Model Anal…** **2A - Our Photon Model Anal…** **4A -2025 Photon Model Anal…**	**10.A** Use data about the effect of EM radiation on human beings and solar cells to look for patterns at a macroscopic scale to revise our working explanation of the types of EM radiation that can cause damage to living cells. (SEP: 4.5; CCC: 1.1; DCI: PS4.B.2) **10.B** Evaluate the merits of the wave and photon models of EM radiation to determine which reasoning better explains how high-frequency EM radiation can cause ionization of atoms and emission of electrons from a solar cell. (SEP: 7.2; CCC: 2.2; DCI: PS4.B.1, PS4.B.2, PS4.B.3)	• The photons of visible EM radiation or higher frequency have enough energy to cause emission of electrons from photovoltaic materials in solar cells. • Ionizing radiation can cause changes in the structure of the DNA molecule, potentially altering its function. • More high-frequency ionizing radiation puts you at greater risk of cancer, but how much the risk increases depends on the type of radiation and the total exposure time. • The photon model of EM radiation can better explain the interactions of high-frequency EM radiation and matter. ***What's next?*** *We will wonder how EM radiation can be used to create and store digital images. We will read about how the interactions of X-rays with matter can be harnessed to create images of the internal structure of our body, and the advantages and disadvantages of digital and*

			conventional radiography. We will wonder about how EM radiation is used in wireless communication to transmit information.
Lesson 1.e: Should we send astronauts into space? Assessment: Working towards **HS-PS4-4**	CER emphasis on the wavelength, frequency and energy of light) **Morality in Space ACC '25-26** **Morality in Space group org…**	**Learning Target:** I can construct a written argument for the following prompt: should we send astronauts in space? **Success Criteria:** I will… • identify the most important benefit and drawback of sending astronauts into space. • write a clear claim and support my claim with the best evidence • explain how the evidence supports my claim using scientific vocabulary AND include a counter argument • argue if we should send astronauts in space including evidence to support your position as well as the counterargument.	*Students will learn about the guidance given to NASA by the Institute of Medicine to inform decision making regarding human space travel. Students will assess the risk-reward dynamic inherent to sending human beings into space to conduct scientific research, and will ultimately be asked to grapple with the ethics of the scenarios of the missions.* *Students will analyze relevant data sets in order to make practical and moral judgments on NASAs decisions to send humans into space.* *Students will construct an argument which promotes a moral stance in support of or against sending human beings into space for the sake of advancing scientific knowledge.*
LS1 Common Assessment - Part 1: Properties of Light Transfer Task **Properties of Light & 5G Assessment ACC 25-26** **Built on Canvas using this:**		Learning Target: I can use properties of electromagnetic waves (wavelength, frequency, and speed) and patterns in data (optical density) to *effectively communicate* how light behaves in different materials and evaluate scientific claims about electromagnetic radiation. **HS-PS4-1; ; VoG: Communication**	

Types of Light check-in ACC 23-24

Data Table 1: Optical Density and Speed

Common Materials Composition	Optical Density (M/L)	Average Speed of light (m/s)
Air	1.00	3.00×10^8
Liquid Hydrogen	1.10	2.73×10^8
Water	1.33	2.26×10^8
Vegetable Oil	1.47	2.04×10^8
Mercury	1.62	1.85×10^8

Image 2: Radio Wave entering Exoplanet Surface

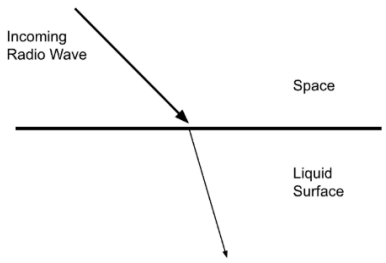


Image 2: Incoming Radio Wave refracting (bending) through a different material

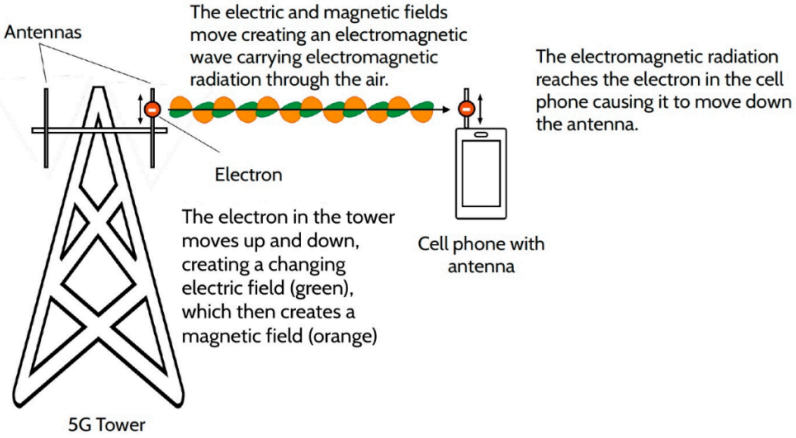
Success Criteria:

- calculate the speed of a wave using wavelength and frequency with correct units.
- compare different types of electromagnetic waves using wavelength and frequency.
- explain how and why the speed of light changes when it enters different materials.
- construct a scientific explanation (claim, evidence, reasoning) based on data

LS1 Common Assessment - Part 2: Evaluating 5G Safety Transfer Task

Built on Canvas using this:

Evaluating 5G Safety - Raccio



-Answer key and worksheets here:

Lesson 13 - P.5 Electromagnetic Radiation

Learning Target: I can *critically think by* evaluating arguments about the dangers of 5G radiation. HS-PS4-4, **VoG: Critical Thinking**

Success Criteria:

- identify the claim
- identify the evidence being used to support each of the author's claims
- Identify the author's reasoning or explanation of the evidence.
- consider the validity of the evidence provided by each claim in the social media post

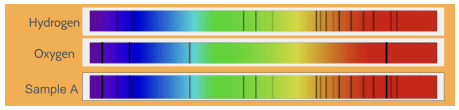


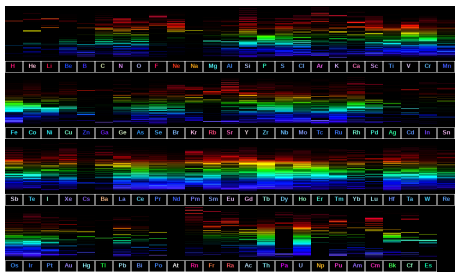
Learning Sequence 2: Matter and Forces within Stars

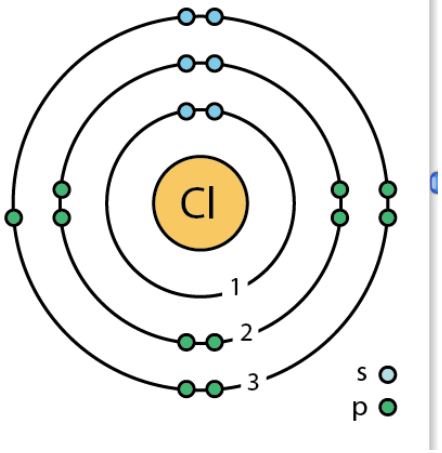
Class Notes - LS2: Stars: How do Stars Produce Energy and Matter? (ES Astronomy) - Duffy

Lesson 2.a: How does the matter in guest stars compare to stable stars?

Lesson 2 - P.6 Stars & the B…







P.6 Lesson 2 Teacher Edition

-ANALYZE IMAGES OF GUEST STAR REMNANTS AND THE SUN

Star Spectra- Duffy

-SPECTRAL TUBES DEMO (no worksheet? I don't think it is necessary)

-INTRODUCE PLASMA AND ATOMIC STRUCTURE

Plasma and Atomic Structur…

-Atomic Structure Simulation

-Ptable

Hatch versions

Plasma and Atomic Structur…

Atoms & Bohr Models ACC '…

Learning Target: I can use and compare different spectra to explain how the composition and temperature of stable stars differ from stars that suddenly change, like guest stars.

Success Criteria: I will…

- analyze and interpret light spectra from different stars.
- identify the patterns of absorption or emission lines that reveal what elements are present in a star.
- describe how the color and shape of a spectrum relate to a star's composition and temperature.
- use evidence from multiple spectra to explain why guest stars appear brighter or change color during stellar events.

2.A Integrate information from multiple spectra representations to describe differences in the composition and temperature

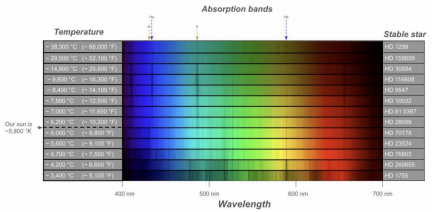
How does the matter in guest stars compare to stable stars? We compare photos of the parts of the sky where some of these guest star events were observed and notice remnants of what looks like gas or dust. We analyze spectra to determine the composition of the matter that these remnants are made of and its temperature. We compare these to the spectra of stable stars and add to our Progress Trackers. We ask new questions and add them to our Driving Question Board.

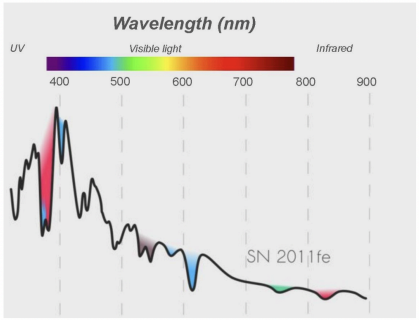
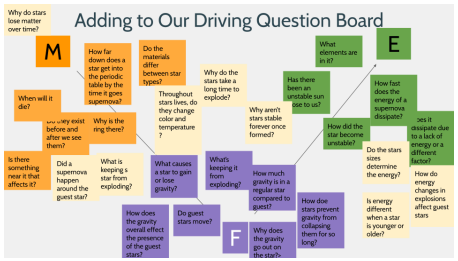
What students will figure out:

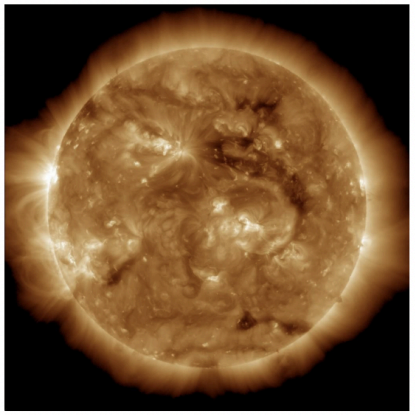
- Stable stars are made of mostly hydrogen and helium, and their temperatures vary across a certain range.
- Hydrogen and helium are the two lowest-mass elements.

What's next?

We will consider how studying energy and matter in stable stars could help us answer our questions. We will be introduced to two new tools, the Planning for

		scale of a stable star versus guest stars. (SEP: 8.2; CCC: 3.1; DCI: ESS1.A.2) **Learning Target:** I can analyze and interpret the periodic table to determine the total number of an element's subatomic particles. **Success Criteria: I will…** • use a model of atoms to identify the subatomic particles. • use a periodic table to identify the protons, neutrons and electrons for stable atoms. • create models of elements from the periodic table.	*Obtaining Information Tool and the Obtaining Information Tool, and we will use them to research answers to our questions. We will come to consensus and record our ideas in our Progress Trackers and Personal Glossaries. We will revisit the DQB.*
Lesson 2.b: What new questions can we ask about stable and unstable stars? **Lesson 2 - P.6 Stars & the B…**  *Semi-spherical shaped clouds of dust and gas can be seen in telescopic images from locations in the sky where guest stars were once observed.*	**P.6 Lesson 2 Teacher Edition** **-ANALYZE DATA TO IDENTIFY THE COMPOSITION AND TEMPERATURE OF STABLE STARS** **Blackbody Spectrum** **-MAKE PREDICTIONS AND ANALYZE GUEST STAR REMNANTS** **-ASK QUESTIONS**	**Learning Target:** I can ask questions based on the spectra of a guest star to figure out why some stars stay stable for a long time while others change suddenly. **Success Criteria:** I will… • examine spectra from guest stars and stable stars to notice patterns and differences. • ask scientific questions about what causes changes in a star's	How does the matter in guest stars compare to stable stars? We compare photos of the parts of the sky where some of these guest star events were observed and notice remnants of what looks like gas or dust. We analyze spectra to determine the composition of the matter that these remnants are made of and its temperature. We compare these to the spectra of stable stars and add to our Progress Trackers. We ask new questions and add them to our Driving Question Board. **What students will figure out:**

	 **-EXIT TICKET: complete Atomic Structure/Bohr Model Check-In individually**	brightness, color, or composition. • use my questions to guide further research or investigation about star stability and change. **2.B** Ask questions that arise from the spectra of a guest star to seek additional information about how and why some stars appear to remain stable for so long and others change so quickly. (SEP: 1.1; CCC: 7.1; DCI: ESS1.A.2)	• Stable stars are made of mostly hydrogen and helium, and their temperatures vary across a certain range. • Hydrogen and helium are the two lowest-mass elements. ***What's next?*** *We will consider how studying energy and matter in stable stars could help us answer our questions. We will be introduced to two new tools, the Planning for Obtaining Information Tool and the Obtaining Information Tool, and we will use them to research answers to our questions. We will come to consensus and record our ideas in our Progress Trackers and Personal Glossaries. We will revisit the DQB.*
Lesson 3: What is happening with matter and energy in stable stars, like our Sun, and how does this help us understand guest stars? **Lesson 3 - P.6 Stars & the B…**	**P.6 Lesson 3 Teacher Edition** **Nuclear Fusion card sort** **Fusion Card Sort (to make copies if needed)** **Nuclear Fusion Cardsort (virt…** **-INTRODUCE THE PLANNING FOR OBTAINING INFORMATION TOOL**	**Learning Target:** I can use information from multiple sources to explain how nuclear processes in stars affect their behavior and changes during the beginning and middle stages of their lives. **Success Criteria:** I will… • find and compare information about nuclear fusion	What is happening with matter and energy in stable stars, like our Sun, and how does this help us understand guest stars? We consider how studying energy and matter in stable stars, including the Sun, could help us answer our questions about guest stars and form research groups. We are introduced to the [material: PB.L3.HO1] and consider the



Stars like the Sun are very hot and transfer energy out toward the Earth. The remnant cloud of gas left over after a guest star event also appears to transfer energy and contain different types of matter than stable stars.

Planning for Obtaining Infor…

-CONTINUE FIRST RESEARCH CYCLE

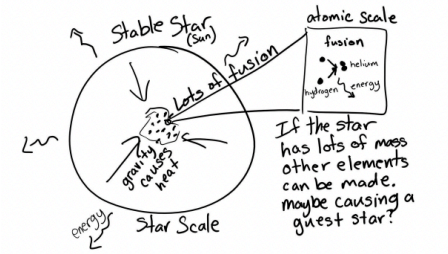
-BUILD CONSENSUS IN A SCIENTISTS CIRCLE

-AFTER CONSENSUS CIRCLE:

Fusion in Stars ACC '23-24

Fusion in Stars ACC '25-26

-MODELING OUR SUN, A STABLE STAR



processes in stars using multiple web sources.
- use the information to answer questions about how stars like the Sun change over time.
- integrate evidence from different sources to update or refine my explanations.
- explain my findings clearly, showing how nuclear processes drive changes in matter and energy inside stars.
- create, analyze and draw fusion reactions to show and explain how atoms behave in stars to create light.

3.A Compare and integrate information about nuclear processes in stars and how their scale affects their significance from a list of web sources in order to obtain information to address a question and make progress on

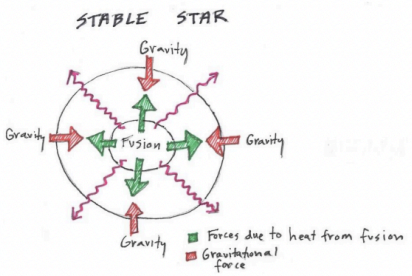
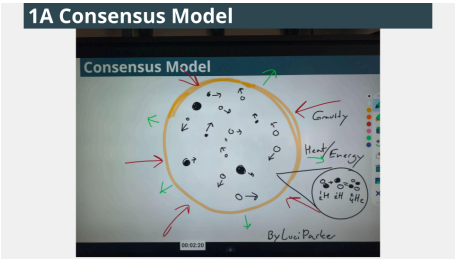
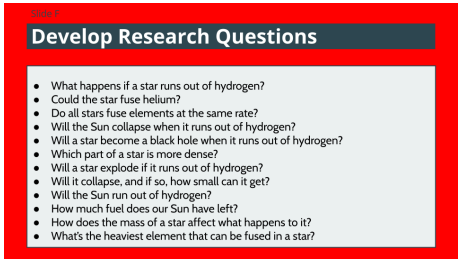
credibility of sources. We use a new tool called the Obtaining Information Tool to keep track of what we find out. We come to consensus around the answers to our research questions and record our ideas in our Progress Trackers and Personal Glossaries. We revisit questions on the DQB.

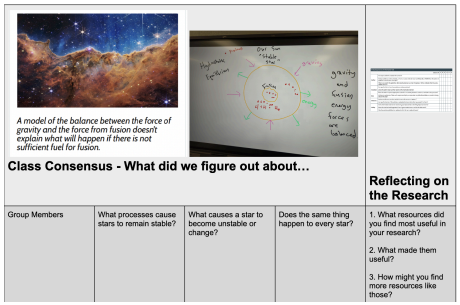
What students will figure out:

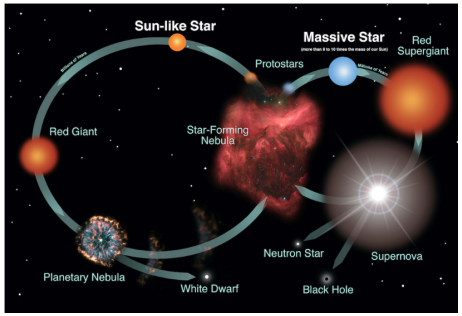
- A star is an object that is massive enough to ignite fusion.
- Energy from fusion causes stars to emit electromagnetic energy.
- Fusion results in new elements as multiple nuclei become one.

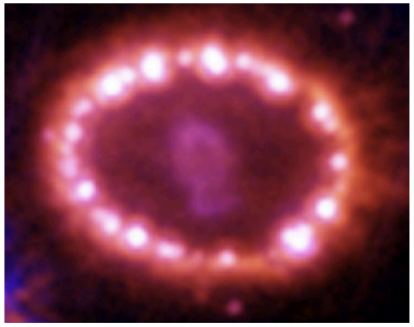
What's next?

We will model the macro forces of a star to help us figure out what keeps stars stable. We will develop research questions, and we will be introduced to a new tool for evaluating sources. We will gather information and communicate our findings in a gallery tour. We will come to consensus on what causes stars to remain stable or become unstable and change and record

		our models of why and how stars like the Sun change at the beginning and middle of their lives. (SEP: 8.2; CCC: 3.1, 5.2, 5.5; DCI: ESS1.A.4, PS1.C.1, PS3.D.4, ESS1.A.1)	*those ideas in our Progress Trackers.*
Lesson 4: How does running out of fuel cause a star to change? **Lesson 4 - P.6 Stars & the B…**   *A model of the balance between the force of gravity and the force from fusion doesn't explain what will happen if there is not sufficient fuel for fusion.*	**P.6 Lesson 4 Teacher Edition** **-MODEL STABILITY IN STAR SYSTEMS**  **-DEVELOP RESEARCH QUESTIONS**  **-BEGIN SECOND RESEARCH CYCLE WITH EVALUATE SOURCES AND OBTAIN INFORMATION** **Evaluating Sources of Infor…** **P.6 Lesson 4 Reference Eva…**	**Learning Target:** I can gather and use information from multiple reliable sources to explain how stars, including the Sun, remain stable and how they can become unstable over their life cycles. **Success Criteria:** I will… • evaluate the quality and usefulness of multiple sources for answering my questions. • integrate information from different sources to refine my explanations of star behavior. • explain how changes in matter and energy within a star cause it to stay stable or become unstable over time. **4.A** Ask questions that arise from our research on fusion and from modeling the forces in stars when they are stable to clarify and seek additional information about how stars change when their fuel runs	How does running out of fuel cause a star to change? We model the macro forces of a star to help us figure out what keeps stars stable and make sense of the balance between gravity and outward pressure in stable stars. We develop research questions and are introduced to a new tool: the [material:PB.L4.HO1]. We gather information and communicate our findings in a gallery tour. We come to consensus on what causes stars to remain stable or become unstable and change and record those ideas in our Progress Trackers. **What students will figure out:** • Stars exist because there is a balance (or equilibrium) between gravity forces pushing inward and the outward pushing forces of the hot, fast moving particles at the center of the star (due to

	Star Research Posters - Duffy **-GALLERY TOUR** **(insert student examples)** **-COME TO CONSENSUS ON WHAT WE FIGURED OUT**  A model of the balance between the force of gravity and the force from fusion doesn't explain what will happen if there is not sufficient fuel for fusion. **Class Consensus - What did we figure out about…** **Reflecting on the Research** Group Members | What processes cause stars to remain stable? | What causes a star to become unstable or change? | Does the same thing happen to every star? 1. What resources did you find most useful in your research? 2. What made them useful? 3. How might you find more resources like those? --- **AFTER RESOURCE POSTERS:** **Star In A Box ACC '25-26 (with HR questions)** **How are Stars Different?- D…** **Stellar Evolution Pictures - D…** **Stellar Evolution Card Sort - …** **Stellar Evolution Card Sort - Duffy** **EXAMPLE Stellar Evolution …** **Stellar Evolution Readings A…** **Use this simulation to validate their card sort decisions:** **WWTA | Life Cycle of Stars** **Teacher Reference Diagram for**	out. (SEP: 1.1, 1.4; CCC: 5.2, 7.1, 7.3; DCI: ESS1.A.4, PS3.D.4) **4.B** Gather, read, evaluate, and integrate information from multiple authoritative internet sources, assessing the evidence and usefulness of each source in answering our questions about how stars (including our Sun) remain stable and can become unstable over their life cycles and communicate the information with graphics and text. (SEP: 8.2, 8.3, 8.5; CCC: 7.1, 7.3; DCI: ESS1.A.1, ESS1.A.4, PS1.C.1) **Learning Target:** I can illustrate the paths that stars of different mass will take over time. **Success Criteria:** I will... • analyze the HR diagram to identify patterns between stars and explain how they are different. • describe how the mass of a star affects the lifespan and life stages of the star. • describe how fusion in a star changes over time (using specific reactions) • describe how the brightness, radius, and temperature of a star	energy released by fusion). • A feedback loop between gravity and fusion maintains this equilibrium. • Stars eventually run out of hydrogen in their cores. When there is not enough concentration of particles to keep fusing heavier elements, the equilibrium is broken, and the star will die. • What happens to a star when it dies depends on its mass. More massive stars run out of fuel faster because their gravity will cause the concentration of particles in the core to be higher, increasing fusion rates. • When a star like the Sun runs out of hydrogen to produce energy, the core will cool and condense. The Sun will become a red giant because of a multi-step process kicked off by this cooling and condensing and eventually fade away. • Massive stars can fuse heavier elements, up to iron for super-massive stars.

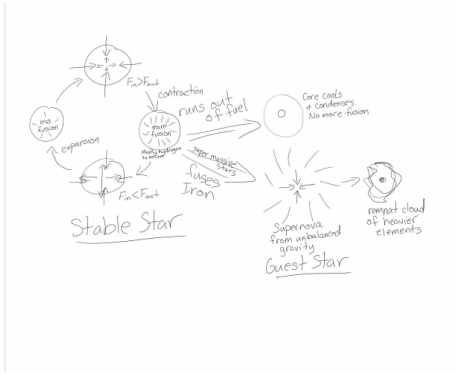
	student models:  	changes between its main stages over time.	• When a very massive star fuses iron in its core, the reaction will no longer release energy, and there will not be enough outward force to balance gravity, disrupting the stable feedback loop. The star collapses and bounces back in what is called a supernova. • Supernovae transfer a lot of energy into space. What ancient astronomers called "guest stars" are actually the light that results from this transfer of energy. ***What's next?*** *We will create a Gotta-Have-It Checklist to explain what cause-effect relationships occur within stars. We will model the feedback loop that keeps stars stable and what happens when this loop is disrupted. We will update the Scale Chart and revisit the DQB.*
Lesson 5: Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away? **Lesson 5 - P.6 Stars & the B…** **P.6 Lesson 5 Answer Key El…**	**P.6 Lesson 5 Teacher Edition** **BEFORE LESSON 5 STARTS:** **Why Do Stars Change? AC…** **-INDIVIDUAL MODELING AND PEER FEEDBACK**	**Learning Target:** I can develop and revise models to show how feedback loops keep stars stable, and how disruptions in these loops can cause sudden, dramatic changes depending on a star's mass.	Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away? We think we are ready to explain why a guest star appears and disappears, so we create a Gotta-Have-It Checklist to

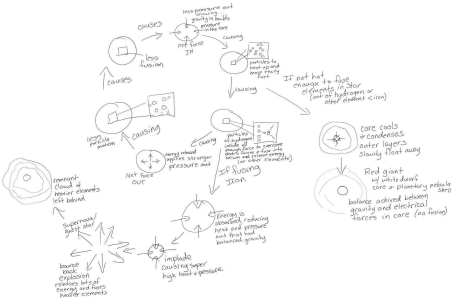


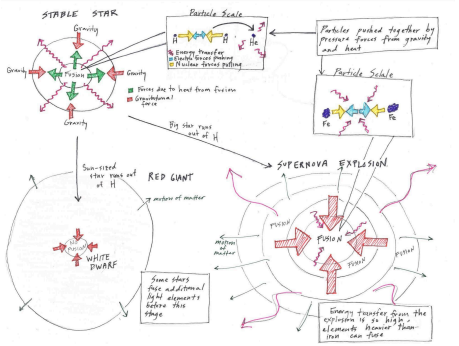
A guest star appears and then disappears, but other stars shine with steady light. The cloud left over after a supernova is hotter than the original star and contains different matter.

Modeling Stellar Stability - D…

-CONSENSUS MODELING







-UPDATE THE SCALE CHART

Success Criteria: I will…

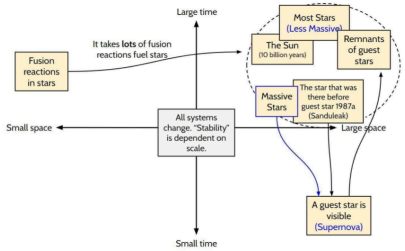
- explain how the elements being produced are different among the different types of stars
- create and update models of stellar systems based on evidence from multiple sources.
- describe how feedback loops regulate matter, energy, and forces within stars.
- explain how the mass of a star affects its stability and response to disruptions.

5.A Develop and revise models based on evidence from a variety of sources to illustrate how feedback loops keep stellar systems stable and how, depending on the mass of the star, disruptions in these loops can cause sudden, catastrophic changes.(SEP: 2.3; CCC: 3.1, 7.1, 7.3; DCI: ESS1.A.4, ESS1.A.1)

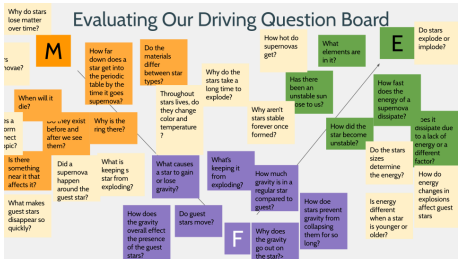
explain what cause-effect relationships occur within stars. We individually, then collectively, model the feedback loop that keeps stars stable and what happens when this loop is disrupted. We update the Scale Chart and revisit the DQB. We begin to wonder where the stuff for the first stars came from.

What students will figure out:

- A guest star is a star that tried to fuse iron in its core, which is an endothermic reaction (it needs energy). This breaks the feedback loop that keeps stars stable.
- The stable period for a star ranges from a few million years for the most massive to trillions of years for the least massive.
- When the feedback loop is broken for a super-massive star, the star will collapse and bounce back out. releasing a lot of energy and fusing elements heavier than iron. When this happens, the star in the sky appears very bright.
- After this event, the energy



-DQB REVISIT



will move outward into space, and the star will fade away as the gas begins to disperse into a remnant cloud of heavier elements.

What's next?

We will look at spectra of stars, galaxies, and empty space and notice puzzling patterns in each that might hold clues to how the matter in the Universe has changed over time. We will be introduced to the Communicating Information Planning Tool and use all four research tools in small groups to obtain, evaluate, and communicate our ideas. We will come to a consensus about the evidence we uncovered, which points to an event called the Big Bang, and read about what it means that people call the Big Bang a "theory."

LS2 Common Assessment:
Algol Transfer Task

Built in Canvas using:

- **Stellar Evolution Assessment ACC '25-26**

Above is a combined:

- ~~**Matter & Fusion Assessment ACC 24-25**~~
- ~~**Stellar Evolution Assessment ACC '24-25**~~

Learning Target: I can *critically think* about evidence and models to explain how fusion changes matter in stars and how those changes can be used to determine a star's age. HS-ESS1-3, HS-PS1-8 ; **VoG: Critical Thinking**

Success Criteria:

- analyze data about star composition, fusion reactions, and energy production.
- develop and use models to explain how elements are formed through nuclear fusion.

Table 1: Comparison of Sun to White Dots

Object	Composition	Brightness (Watts)	State of Matter	Shape
Sun	Hydrogen (73%), Helium (24%), Beryllium (2%), Carbon (1%)	3.8×10^{26}	Plasma	Spherical
White Dot #1	Helium (50%), Carbon (20%), Beryllium (22%), Oxygen (5%), Silicon (2%) and Sulfur (1%)	5.8×10^{26}	Plasma	Spherical
White Dot #2	Hydrogen (90%), Helium (9%), Beryllium (1%)	2.8×10^{26}	Plasma	Spherical

Study guide built on Canvas

~~**Matter and Fusion study guide 23-24**~~
~~**Life of Stars Study Guide**~~

- use evidence to make and support a claim about the relative ages of stars.

Common Assessment:
Built in Canvas based on this google form
Also incorporated feedback loop model from Lesson 5
P.6 Lesson 5 Answer Key Electronic Exit Ticket

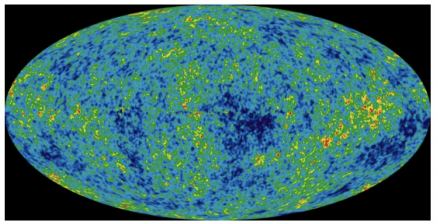


Learning Target: I can construct a model to *effectively communicate* how feedback loops keep stars stable, and how disruptions in these loops can cause sudden dramatic changes depending on a star's mass.. HS-ESS1-1, **VoG: Communication**

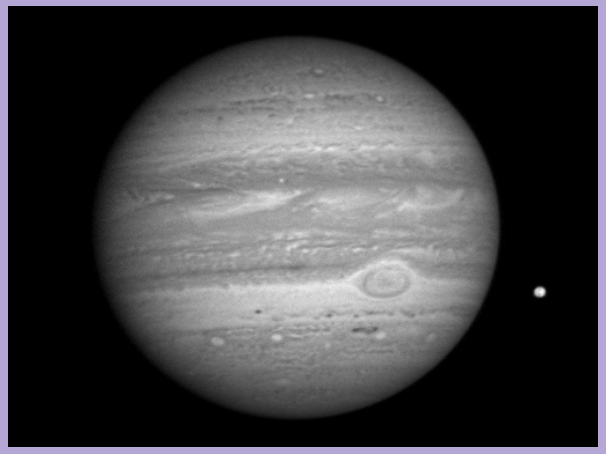
Success Criteria: I will…

- create and update models of stellar systems based on evidence from multiple sources.
- describe how feedback loops regulate matter, energy, and forces within stars.
- explain how the mass of a star affects its stability and response to disruptions.
- use my models to illustrate how changes in these loops can lead to sudden, catastrophic events.
- support my explanations with evidence from data, simulations, or observations of real stars.

5.A Develop and revise models based on evidence from a variety of sources to illustrate the feedback loop processes within star systems that keep them stable and the disruptions in these loops that can cause sudden change in the system and what happens then, based on the

		mass of the star. (SEP: 2.3; CCC: 3.1, 7.1, 7.3; DCI: ESS1.A.4, ESS1.A.1)	
Learning Sequence 3: Stars and the Big Bang			
Lesson 6: How has the matter in the Universe changed over time, and how do we know? **Lesson 6 - P.6 Stars & the B…**  *When we look at spectra of stars, galaxies, and empty space, we notice puzzling patterns that cannot yet be explained by our model.*	**P.6 Lesson 6 Teacher Edition** **Duffy combined handout version of Lesson 6:** **-LOOK AT SPECTRA OF STARS, GALAXIES, AND SPACE** **-THIRD RESEARCH CYCLE** **-TIMED GALLERY TOUR'**	**Learning Target:** I can explain how evidence from spectra, galaxy motion, element composition, and cosmic radiation supports the Big Bang theory. **Success Criteria:** I will… ● read and evaluate information from multiple reliable sources about the Big Bang theory. ● identify empirical evidence that supports the theory, including: ○ spectral patterns from distant galaxies, ○ the redshift showing galaxies moving away from us, ○ the composition	How has the matter in the Universe changed over time, and how do we know? We look at spectra of stars, galaxies, and empty space and notice puzzling patterns in each that might hold clues to how the matter in the Universe has changed over time. We decide to research each question and come back together to communicate our findings. We are introduced to the [material: PB.L6.HO2] and use all four research tools in small groups to obtain, evaluate, and communicate our ideas. We come to consensus about the evidence we uncovered, which points to an event called the Big Bang, and read about what it means that people call the Big Bang a "theory." Finally, we add to our Progress Trackers and our Personal Glossaries. **What students will figure out:** ● The Big Bang theory is supported by evidence. ● Evidence for the Big Bang

		of stars and gases, and ○ maps of cosmic background radiation. • explain how my researched evidence shows that the Universe has expanded over time. • communicate my understanding using clear graphics, models, or text-based explanations. • connect each type of evidence to the scientific reasoning that supports the Big Bang model. **6.A** Read, evaluate, and communicate information about the Big Bang to explain that the theory is supported by empirical evidence of spectral patterns, including observations of distant galaxies receding from our own, of the measured composition of stars and non-stellar gases, and of maps of radiation permeating the Universe. (SEP: 8.3, 8.5, 7.2;	includes observations of distant galaxies moving away from us, the measured composition of stars, and maps of spectra of the cosmic microwave background, which all match Big Bang models. ***What's next?*** *We will record questions we still want answered on our DQB and then broaden to think about questions we have about other types of phenomena. We will reflect on what investigations we can through online research, future science classes, a career in STEM, and/or a lifetime of*

		CCC: 1.5; DCI: ESS1.A.3, ESS1.A.2, ESS1.A.4)	
Common Assessment: **-LS1 Summative Assessment: Jupiter Transfer Task** Lesson 7: How can we use the practices and crosscutting concepts we have developed to figure things out on our own? Built in Canvas:  P.6 Lesson 7 Answer Key Jupiter Transfer Task		**Learning Target:** I can ask meaningful scientific questions about real-world phenomena and plan how to find, evaluate, and share information to answer them using the science and engineering practices I've learned. **Success Criteria:** I will… ● reflect on my own life experiences to identify puzzling phenomena I want to explain. ● ask testable and relevant questions that connect to ideas from this course. ● plan how to obtain and evaluate information to investigate my questions. ● decide how to communicate my findings clearly using scientific reasoning and evidence. ● apply the science and engineering practices and crosscutting concepts I've developed throughout this and other OpenSciEd High School units.	**What students will wonder:** How can we use the practices and crosscutting concepts we have developed to figure things out on our own? We consider how the M-E-F triangle frames and our understanding of stability and change help us make sense of our phenomena. We record questions we still want answered on our DQB and then broaden to think about questions we have about other types of phenomena. We reflect on what investigations we can through online research, future science classes, a career in STEM, and/or a lifetime of curiosity. We then engage in a final transfer task. **What students will figure out:** ● Stability and change and the M-E-F triangle frames are valuable tools for making sense of our natural world. ● We can use the lenses we have developed and our research tools to continue to investigate our questions outside of class and beyond ***What's next?***

		END OF UNIT.

Astronomy

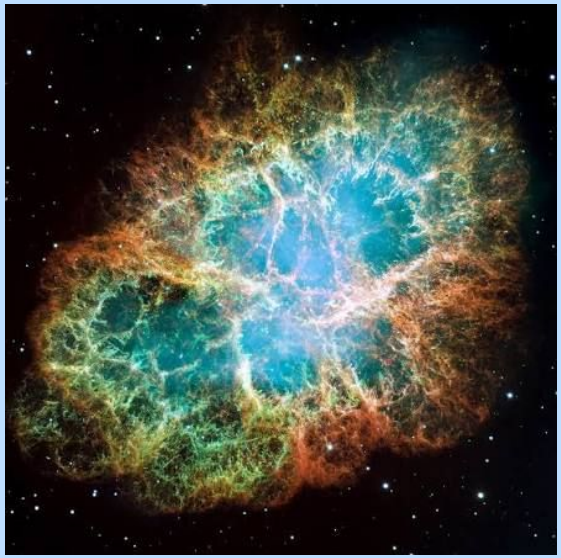


ACC & ACA Earth Science Course-Unit 4

Written by Nicole Raccio & Kelsey Duffy
Presentation Created by Nicole Raccio
October 21, 2026

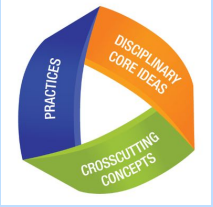
Unit 4: Astronomy

This unit is anchored in historical observations of stars that suddenly appeared and then disappeared within a short period of time. These phenomena prompt students to question why most stars seem constant while others change so dramatically. Students analyze images and spectral data from the remnants of these events. Students build a shared understanding of nuclear fusion and the life cycles of stars.

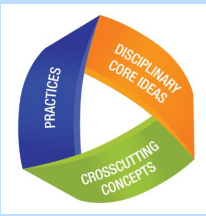


Standards Assessment

- HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation.
- HS-ESS1-2 Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. (ACC ONLY)
- HS-ESS1-3 Communicate scientific ideas about the way stars, over their life cycle, produce elements.
- HS-PS1-8 Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes ~~of fission~~, fusion, ~~and radioactive decay~~.
- HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media
- HS-PS4-4 Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
    - HS-PS4-5 Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.* (ACC ONLY)
    - HS-PS4-3 Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.



SEPs, DCIs, & CCCs



Science & Engineering Practices (SEP)

- Using Mathematics and Computational Thinking
- Obtaining, Evaluating, and Communicating Information
- Developing and Using Models
- Constructing Explanations and Designing Solutions (ACC ONLY)

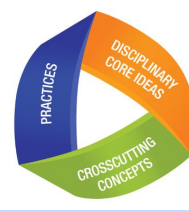
Disciplinary Core Ideas (DCI)

- PS4.A: Wave Properties
- PS4.B: Electromagnetic Radiation
- PS3.D: Energy in Chemical Processes and Everyday Life
- ESS1.A: The Universe and Its Stars
- PS1.C: Nuclear Processes

Crosscutting Concepts (CCC)

- Cause and Effect
- Scale, Proportion, and Quantity
- Energy and Matter

Learning Sequence 1: Energy from Stars



Lesson Level Question:

- Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away?
- How does energy transfer through a wave?
- What other types of EM radiation are there, and how do we use them?
- Does all electromagnetic radiation cause damage? Wave/Particle Duality
- Should we send astronauts into space?

Learning Objectives

- I can develop a model to explain why most stars we see in the night sky appear stable while some "guest stars" change over time.
- I can use and make a physical model of energy transfer in stars by comparing and contrasting different waves.
- I can plan and conduct an investigation using a pHet simulation to identify how certain wave properties affect energy transfer in waves.
- I can use mathematics to calculate the speed of light by using wavelength, frequency, and energy as variables to analyze the speed of light through different materials (cause and effect).
- I can obtain and evaluate information about how EM radiation can be harmful based on its frequency, wavelength, and interactions with matter.
- I can obtain, evaluate, and communicate information about how high amplitude or low frequency electromagnetic radiation is more dangerous and how it affects various materials.
- I can obtain, evaluate, and communicate information to explain why some types of EM radiation can cause damage to living cells by understanding the scale, proportion, and quantity of different EM radiation waves.
- I can obtain, evaluate, and communicate information about if we should send astronauts to space and make a connection to electromagnetic radiation by understanding the cause and effect of the dangers of electromagnetic radiation.
- I can revise my initial model of a guest star and a stable star to include the transfer of energy released.

Assessment:

Properties of Light and Evaluating 5G Safety

Part 1: Properties of Light
The NASA "Planets Beyond Our Solar System" Team has used various techniques to locate planets outside of our solar system, which are known as ***exoplanets***. Once an exoplanet is identified, scientists use observational data to learn more about the planet.

Scientists detect radio waves moving toward a newly discovered exoplanet. They discover the radio wave entering a liquid surface.
Your task is to determine the composition of the liquid on the planet.

Data Table 1: Optical Density and Speed

Common Materials Composition	Optical Density (M/L)	Average Speed of light (m/s)
Air	1.00	3.00×10^8
Liquid Hydrogen	1.10	2.73×10^8
Water	1.33	2.26×10^8
Vegetable Oil	1.47	2.04×10^8
Mercury	1.62	1.85×10^8

Graph 1: Speed of Light vs Optical Density

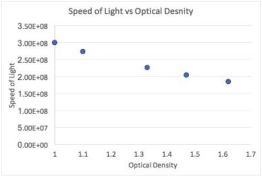


Image 1: Electromagnetic Spectrum

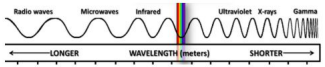


Image 2: Radio Wave entering Exoplanet Surface

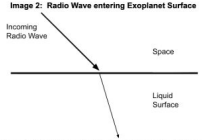


Image 2: Incoming Radio Wave refracting (bending) through a different material

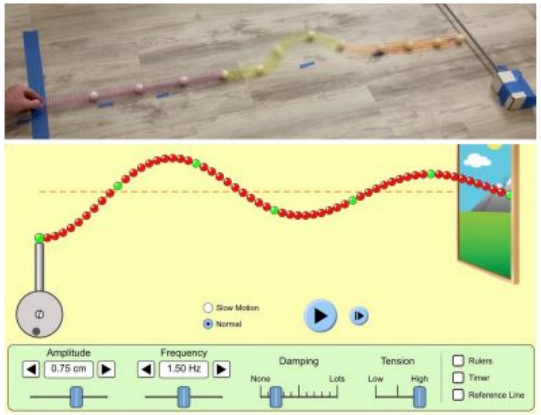
Part 2: Evaluating 5G Safety
You have probably heard the phrase "5G" thrown around a lot lately. It's in cell phone commercials and on the news. Many people are calling it a game-changer for wireless technology. A 5G network should be able to offer significantly faster data transmission speeds than 3G or 4G, and can accommodate much more traffic. This is possible, in part, because 5G networks use a portion of the electromagnetic (EM) radiation spectrum to transmit digital information that isn't currently being used by other wireless communication devices. Companies are racing to increase their 5G coverage nationwide. To support this transition, some companies are building as many as 1 5G tower per block!



Learning Target: I can use models such as diagrams and mathematical models to support scientific explanations about properties of electromagnetic waves (wavelength, frequency, and speed) and patterns in data (optical density) to *effectively communicate* how light behaves in different materials.

Learning Target: I can *critically think* by obtaining, evaluating, and communicating evidence and reasoning to support the validity of evidence provided on social media posts about the dangers of 5G radiation by recognizing the scale, proportion, and quantity of 5G waves.

What students figure out



Shaking the end of a slinky creates a wave pattern. A computer simulation of a wave on a string produces similar patterns.

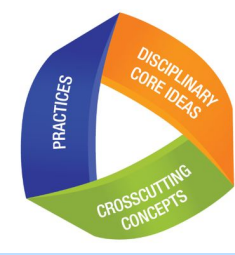


The electromagnetic spectrum includes various types of radiation with a wide range of frequencies, wavelengths, and uses, such as communication and medical imaging, but some types can also pose health risks.



EM radiation affects different materials in different ways.

Learning Sequence 2: Matter and Forces within Stars



Lesson Level Questions

- How does the matter in guest stars compare to stable stars?
- What is happening with matter and energy in stable stars, like our Sun, and how does this help us understand guest stars?
- How does running out of fuel cause a star to change?

Learning Targets

- I can use multiple models to describe differences in the composition and temperature scale of stable star stars versus guest stars by identifying patterns of absorption and emission spectra of different elements.
- I can revise my models of a guest star and a stable star to include the specific matter that makes them up using Bohr models to account for the atomic scale.
- I can obtain, evaluate, and communicate information about nuclear processes in stars and understand how their behavior is affected by these changes during their life stages.
- I can use a computer simulation model to explain how stable stars remain stable and how they can become unstable over their life cycles by describing the nuclear and subatomic scale of atoms.
- I can obtain, evaluate, and communicate information to refine my explanations of how and why stars change temperature, composition and size over their lifespan by describing the macro and microscales of stars during their lifespans.

Assessment:

Final Model and Algol A Transfer Task

The Life of Stars Assessment (mod)

Stars are the most widely recognized astronomical objects, and represent the most fundamental building blocks of galaxies. The study of the birth, life, and death of stars is central to the field of astronomy. Read, analyze and interpret the following information about the two stars called Algol A and Algol B to determine the history and future of these two stars.

Figure 1: Algol A (left) and Algol B (right) Currently

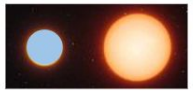


Table 1: Characteristics of Algol A and Algol B

Characteristic	Algol A	Algol B
Current Stage	Main Sequence	Giant
Current Color	Light Blue	Orange
Main Sequence Color	Light Blue	White
Initial Main Sequence Mass	10 x the sun	4 x the sun

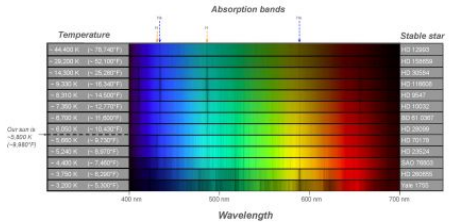
Table 2: The Relationship Between Temperature, Color, and Initial Mass of Stars

Temperature (K)	Color	Average Initial Mass of a Main Sequence Star (x Sun)	Time on the Main Sequence (million years)
More than 33,000	Dark Blue	More than 40	10 or less
10,000-30,000	Light Blue	10	25
7,500-10,000	White	4	200
5,200-7,500	Yellow	1	1200
3,700-5,200	Orange	0.5	60,000
Less than 3,700	Red	Less than 0.5	850,000 or more

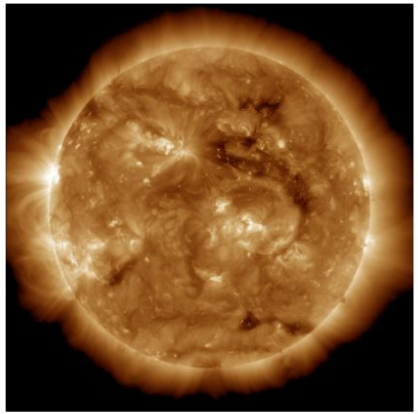
I can construct a model to *effectively communicate* how stable stars remain stable and how they can become unstable over their life cycles by describing the macro and micro scales of stars and their lifespans.

I can *critically think* about evidence and models to explain how fusion changes in matter in stars and how those changes can be used to determine the star's age by observing the macro and micro scales of stars and their lifespan.

What students figure out



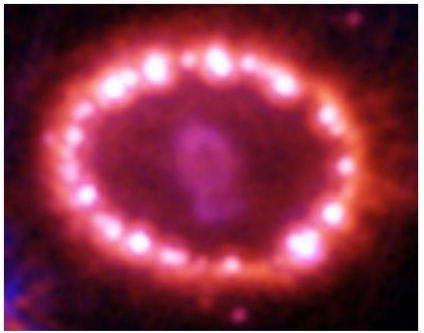
Semi-spherical shaped clouds of dust and gas can be seen in telescopic images from locations in the sky where guest stars were once observed.



Stars like the Sun are very hot and transfer energy out toward the Earth. The remnant cloud of gas left over after a guest star event also appears to transfer energy and contain different types of matter than stable stars.

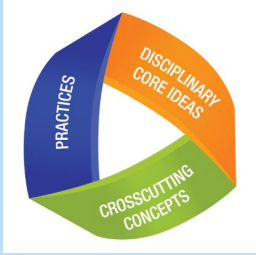


A model of the balance between the force of gravity and the force from fusion doesn't explain what will happen if there is not sufficient fuel for fusion.



A guest star appears and then disappears, but other stars shine with steady light. The cloud left over after a supernova is hotter than the original star and contains different matter.

Learning Sequence 3: Stars and the Big Bang [ACC ONLY]



Lesson Level Questions

- How has the matter in the Universe changed over time, and how do we know?

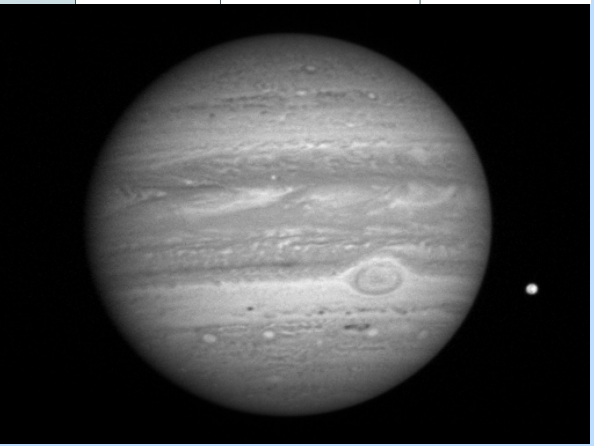
Learning Targets

- Read, evaluate, and communicate information about the Big Bang to explain that the theory is supported by empirical evidence of spectral patterns, including observations of distant galaxies receding from our own, of the measured composition of stars and non-stellar gases, and of maps of radiation permeating the Universe.

Assessment:

Jupiter Transfer Task

	Earth	Sun	Jupiter
Mass	1 x mass of Earth	333,000 x mass of Earth	318 x mass of Earth
Diameter	12,756 km	1,392,500 km	142,984 km
Volume	1 x Earth volume	1,300,000 x Earth volume	1,323 x Earth volume



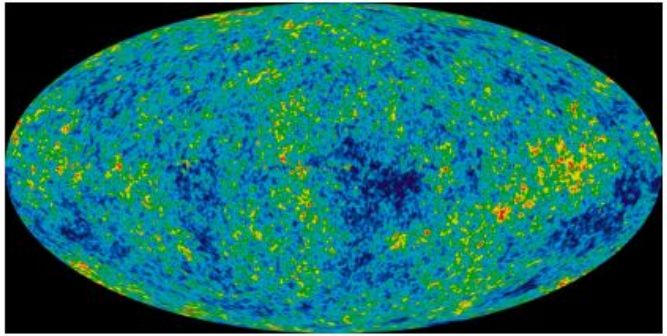
HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the Sun and the role of nuclear fusion in the Sun's core to release energy that eventually reaches Earth in the form of radiation. (SEP: 2.3; CCC: 3.1; DCI: ESS1.A.1, PS3.D.4)

Learning Target: I can develop models of the Jupiter and Sun systems to explain the source of the light we observe and how an object's scale affects interactions in its core.

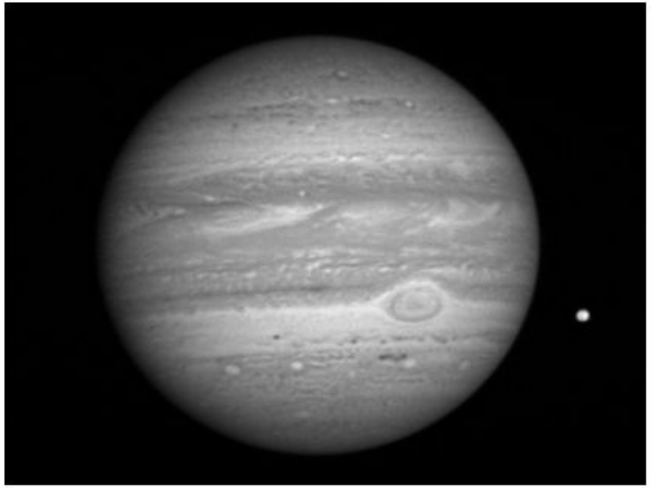
Success Criteria: I will…

- model where the light from Jupiter and the Sun originates.
- compare how differences in scale affect conditions and interactions (fusion) in Jupiter's and the Sun's cores.
- use evidence to explain how core interactions relate to the light each object emits.

What students figure out

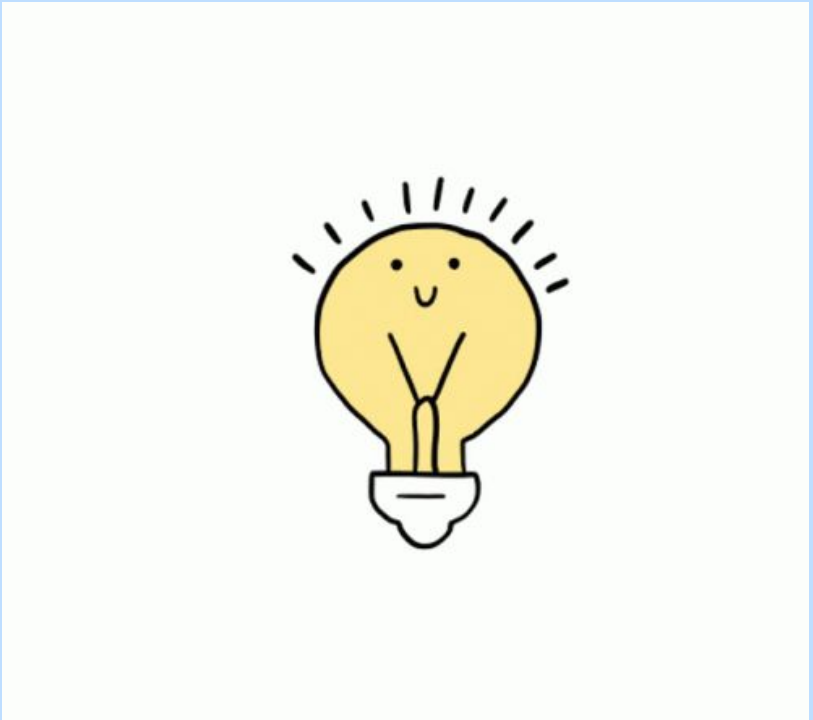


When we look at spectra of stars, galaxies, and empty space, we notice puzzling patterns that cannot yet be explained by our model.



We have so many questions about phenomena that we would like to explore in the future.

Thank you!



BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 10 e.

AGENDA REPORTING FORM

Agenda Topic: SHS Earth Science - Unit 2, Climate Change and Human Impact ACC - NEW - Second Reading.

Summary of Issue: The Curriculum & Instruction Committee has reviewed the SHS Earth Science - Unit 2, Climate Change and Human Impact ACC - NEW.

Background: _____

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Move that the Board of Education approve the SHS Earth Science - Unit 2, Climate Change and Human Impact ACC - NEW – as presented by the Curriculum & Instruction Committee.

Titles of Attachments:

1. Course Proposal

Christine L. Zatin
Signature of Staff Member Submitting Report

Peter Madaras
Signature of Superintendent of Schools

Unit Overview	
Unit Title:	Climate Change and Human Impact ACC
Teacher:	Kelsey Duffy and Jaime Hatch
Grade Level/Course:	9th Grade Earth Science
Length/Dates:	8 weeks
Unit Summary:	Why is the sea level rising, causing some people to have to move? Initial student models in this unit propose a variety of ideas, but it seems like melting polar ice is a likely cause for this global phenomenon. Uncertainty and student concern for the people impacted motivate unit investigations that help students better understand the matter and energy flows that underlie a global phenomenon like polar ice melt and sea level rise. Historical data, hands-on investigations, and typical early-year math (like unit conversions) help students establish the mechanisms that cause sea level rise and estimate its potential impact. Through investigations, simulations, and system models, students figure out how decreasing carbon dioxide emissions and two geoengineering solutions (applying glass microbeads to polar ice and protecting glaciers from warm water with berms) could help slow polar ice melt, protecting coastal communities. As they do so, they 1. begin developing the science practices needed in a chemistry classroom, 2. build a particle-level, quantifiable understanding of thermodynamics, and 3. consider how human activity results in particle-level changes with global implications. C.1: Thermodynamics in Earth's Systems

Performance Expectations
• HS-PS3-1† Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flow in and out of the system are known. • HS-PS3-4 Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperatures are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). • HS-ESS2-2 Analyze geoscience data to make the claim that one change to Earth's surface can create feedback that causes changes to other Earth systems. • HS-ESS2-4† Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate. • HS-ESS2-7† Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.

- **HS-ESS3-1*** Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- **HS-ESS3-5** Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts on Earth systems.
- **HS-ESS3-6†** Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

*This performance expectation is developed across multiple units.
†This performance expectation is developed across multiple courses.

Essential Questions:

- Learning Sequence 1: Why is Sea Level Rising?
  - 1: How are sea levels rising and forcing people to move?
  - 2: What can the past help us figure out about what is causing sea level rise in the present?
  - 3: How does carbon dioxide contribute to climate change?
  - 4: What would happen if the Earth's ice melted?
- Learning Sequence 2: How can we Slow Polar Ice Melt?
  - 5: How can we best slow or stop the land ice melt?
  - 6: Why would some engineers want to sprinkle glass microbeads on the Arctic?
  - 7.a: How do feedback loops affect Earth's systems?
  - 7.b: How do feedback loops affect Earth's systems?
- Learning Sequence 3: How well would the berm solution work?
  - 7.c: How can changes in Earth's systems create conditions for major changes in life on Earth?
  - 8: What is going on where the ice meets the water?
  - 9: Why does warm salty water sink to melt a glacier?
  - ~~10: How can we measure the energy transfer a berm prevents?~~
  - ~~11: How does heat affect the amount of ice melt?~~
  - ~~12: How can we slow the flow of energy on Earth to protect vulnerable coastal communities?~~
  - 13.a: How can we model what will happen to Earth's climate if humans make changes?
  - 13.b: How can we model what will happen to Earth's climate if humans make changes?

Science and Engineering Practices (Skills)	Disciplinary Core Ideas (Knowledge)	Crosscutting Concepts (Enduring Understandings)
Planning and Carrying Out Investigations: This unit **intentionally develops** students' engagement in these practice elements: • Plan an investigation ~~or test a design individually and~~ collaboratively to produce data to serve as the basis for evidence as part of ~~building and~~ revising models, ~~supporting explanations for phenomena, or testing solutions to problems~~. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled. • **Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, ~~risk~~, time), ~~and refine the design accordingly~~.** • Plan and conduct an investigation or test a design solution in a safe ~~and ethical~~ manner including considerations of ~~environmental, social, and~~ personal impacts. • Select appropriate tools to collect, ~~record, analyze, and evaluate~~ data. • Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.	**PS3.D: Energy in Chemical Processes** • Although energy cannot be destroyed, it can be converted to less useful forms—for example, to thermal energy in the surrounding environment. (HS-PS3-3, HS-PS3-4) **ESS1.B: Earth and the Solar System** • **Cyclical changes in the shape of Earth's orbit around the sun, together with changes in the tilt of the planet's axis of rotation, both occurring over hundreds of thousands of years, have altered the intensity and distribution of sunlight falling on the earth. These phenomena cause a cycle of ice ages and other gradual climate changes. (secondary to HS-ESS2-4)** **ESS2.A: Earth Materials and System** • **Earth's systems, being dynamic and interacting, cause feedback effects that can increase or decrease the original changes. (HS-ESS2-1, HS-ESS2-2)** • **The geological record shows that changes to global and regional climate can be caused by interactions among changes in the sun's energy output or Earth's**	**Energy and Matter:** This unit **intentionally develops** students' engagement in these crosscutting concept elements: • The total amount of energy and matter in closed systems is conserved. • Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system. • Energy cannot be created or destroyed—only moves between one place and another place, between objects ~~and/or fields~~, or between systems. • Energy drives the cycling of matter within and between systems. The following crosscutting concepts are also **key to the sensemaking** in this unit: • Stability and Change • Scale, Proportion, and Quantity

Using Mathematics and Computational Thinking: This unit **intentionally develops** students' engagement in these practice elements: ● **Create ~~and/or revise~~ a computational model or simulation of a ~~phenomenon, designed device, process, or~~ system.** ● **Use mathematical, computational, ~~and/or algorithmic~~ representations of phenomena or design solutions to ~~describe and/or~~ support claims ~~and/or explanations~~.** ● Apply techniques of algebra and functions to represent ~~and solve~~ scientific ~~and engineering~~ problems. ● Use simple limit cases to test ~~mathematical expressions, computer programs, algorithms, or~~ simulations of a process or system to see if a model "makes sense" by comparing the outcomes with what is known about the real world. ● Apply ratios, ~~rates, percentages~~, and unit conversions in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m^3, acre-feet, etc.).	**orbit, tectonic events, ocean circulation, volcanic activity, glaciers, vegetation, and human activities. These changes can occur on a variety of time scales from sudden (e.g., volcanic ash clouds) to intermediate (ice ages) to very long-term tectonic cycles. (HS-ESS2-4)** **ESS2.D: Weather and Climate** ● **The foundation for Earth's global climate systems is the ~~electromagnetic~~ radiation from the Sun, as well as its reflection, absorption, storage, and redistribution among the atmosphere, ocean, and land systems, and this energy's re-radiation into space. (HS-ESS2-4)** ● **Gradual atmospheric changes were due to plants and other organisms that captured carbon dioxide and released oxygen. (HS-ESS2-6, HS-ESS2-7)** ● Changes in the atmosphere due to human activity have increased carbon dioxide concentrations and thus affect climate. (HS-ESS2-4, HS-ESS2-6) ● **Current models predict that, although future regional climate changes will be complex and varied, average global temperatures will continue to rise.**	

	The outcomes predicted by global climate models strongly depend on the amounts of human-generated greenhouse gases added to the atmosphere each year and by the ways in which these gases are absorbed by the ocean and biosphere. (secondary to HS-ESS3-6)	

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

C District Rubrics

Performance Assessment(s) and Evaluative Criteria:

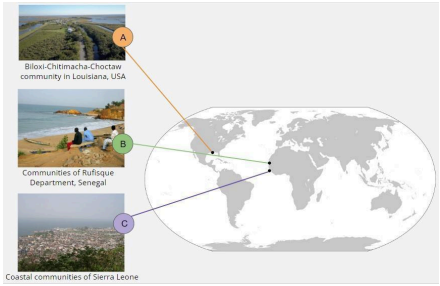
1. LS1 Common Assessment: Human Impact Assessment - Rio de Janeiro Transfer Task: Students design, build, and improve a device that converts energy from one form into another within given constraints.use ratios and unit conversions to predict how human-caused ice melt affects sea level and people.(SEP: 5.5; DCI: ESS3.B.1, ESS3.D.1; CCC: 3.1) **HS-ESS3-1**, **HS-ESS3-5**, **HS-ESS3-6†**
   Success Criteria:
   - identify the quantities involved (ice melt, sea level change, population).
   - use ratios to compare changes at different scales.
   - convert units correctly (for example, ice volume to sea level rise).
   - make predictions about sea level rise using calculations.
   - explain how sea level rise impacts human populations.
2. LS2 Common Assessment: Thawing Permafrost Transfer Task: Students ask questions to understand how positive and negative feedback loops involving plants and other organisms affect Earth's systems. (SEP: 1.4; DCI: ESS2.A.1; CCC: 7.3) **HS-ESS2-2**, **HS-ESS2-4†**, **HS-ESS2-7**
   Success Criteria:

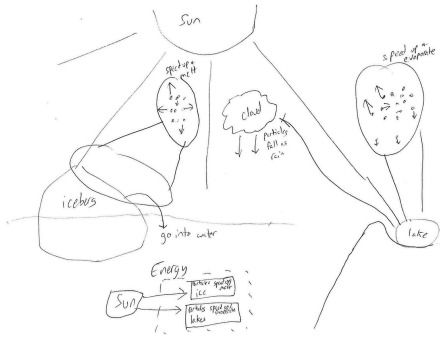
- identify examples of positive and negative feedback loops in Earth systems.
- connect how plants and organisms interact with these feedback loops.
- ask questions that clarify how feedback loops work.
- use evidence from models or data to support my questions.

3. LS3 Common Assessment: Heat Pumps Transfer Task: Students plan an investigation to find a problem with energy transfer in a geothermal heating system. (SEP: 3.5, 3.2; DCI: PS3.B.2, PS3.B.5, PS3.D.1; CCC: 4.2) **HS-PS3-1†, HS-PS3-4**

Success Criteria:

- identify the components of the geothermal system.
- define the energy transfer processes in the system.
- plan steps to investigate potential problems.
- control variables and define system boundaries for the investigation.
- record observations and data to identify energy transfer issues.

Target Question	Activity	Standard Objectives/Learning Target	Student will know and wonder
Learning Sequence 1: Why is Sea Level Rising? **Class Notes: LS1 - Why is Sea Level Rising? Thermodynamics in Earth's Systems**			
Lesson 1: How are sea levels rising and forcing people to move? **Lesson 1 - C.1 Thermodyna…**  C.1 Lesson 1 Teacher Refer…	**C.1 Lesson 1 Teacher Edition** **Duffy combined handout(s) version of Lesson 1:** **Lesson 1 Reference Sheet - …** **-INTRODUCE A PHENOMENON AFFECTING DIFFERENT COMMUNITIES AROUND THE WORLD** **-ANALYZE SEA LEVEL GRAPH**	**Learning Target:** I can ask questions and develop a model to explain how changes in sea level affect human migration by tracking energy and matter through Earth systems. **Success Criteria:** I will… • examine models or data related to sea-level change and identify patterns in change over time or rate of change.	**What students will wonder:** We explore three coastal communities that are affected by rising sea levels. We identify that this is a global problem, with communities responding in different ways. People in some places have to move. We recognize that sea levels have been rising for over a hundred years and model ideas about the matter and energy changes that are causing sea levels to rise. We



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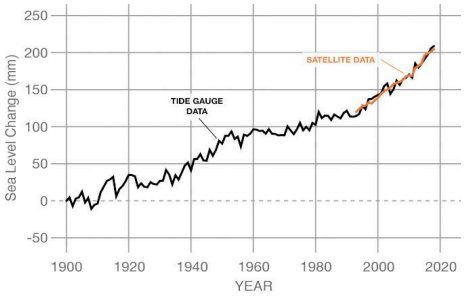


-EXAMINE SEA LEVEL RISE AROUND THE WORLD

Sea Level Projection Tool

-DEFINE THE PROBLEM (climate refugee, climate migrant, internally displaced person)

Community	Population	Elevation Above Sea Level, m	Sea Level Rise (2020), m	Projected Sea Level Rise (2100), m	Response
Carti Sugdub island, Panama	32,000	3	0.07	0.78	Leaders are considering moving people to the mainland. A community for 600 people is estimated to cost $5 million.
Kiribati (Pacific nation composed of 33 islands)	119,000	1.8	0.04	0.68	Spent $8.77 million to purchase land in another country (Fiji) as a new home for its people.
Miami, Florida, USA	454,000	1.8	0.08	0.83	Spending at least $3.8 billion by 2060 for stormwater pumps, sea walls, and other solutions to protect some neighborhoods.
New York City, USA	8.42 million	10	0.1	0.93	Spending $1.45 billion by 2025 on floodwalls, floodgates, and raising some land up to 9 feet higher.
Rotterdam, Netherlands	624,000	0	0.07	0.69	Investing over $4 billion to improve storm surge barriers, build "floating communities," and construct drainage systems.
Shanghai, China	26.32 million	4	0.09	0.95	Has constructed over 300 miles of protective seawalls.
Sundarbans settlements, India	3.9 million	2	0.06	0.76	Community members were building mud seawalls by hand, until the Indian government committed $660 million to build concrete seawalls.
Global total - low-lying coastal communities	680 million	-	-	-	*17 to 72 million people are estimated to eventually have to move due to rising sea levels by 2050. Flooding from sea level rise is estimated to cost $14.2 trillion globally by 2100.*

-RELATED PHENOMENA

-DEVELOP AN INITIAL MODEL

-SHARE INITIAL MODELS WITH PARTNERS

-CO-CONSTRUCT COMMUNITY AGREEMENTS

-CONSTRUCT DRIVING QUESTION BOARD

- ask questions that help clarify how and why sea levels are changing.
- develop an initial model that shows how energy and matter flows contribute to sea-level rise.

1.A Ask questions that arise from examining models to clarify and seek additional information about changes and rates of change in sea levels and the resulting impact on human migration. (SEP: 1.2; DCI: ESS3.B.1; CCC: 7.2)

1.B Develop a model based on evidence to illustrate energy and matter flows in the Earth system that result in changes in human migration. (SEP: 2.3; DCI: ESS3.B.1; CCC: 5.2, 4.2)

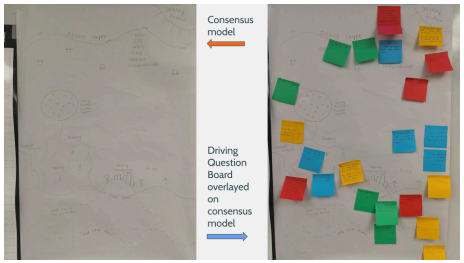
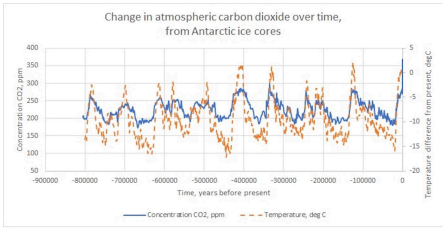
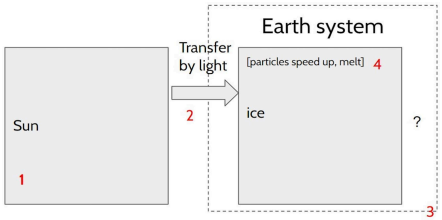
develop community agreements and a class consensus model. We build a Driving Question Board and gather ideas for investigation.

What students will figure out:

- Sea levels are rising--some causes we find are local like storms and erosion, but something is affecting sea levels globally. Scientists predict that this will continue.
- Some communities are able to build infrastructure to protect themselves, but in other places people who live near the coast need to move.
- In chemistry we use ideas about energy and matter to explain confusing things that we see in the world.
- Polar ice melt due to climate change is one explanation for why the sea level is rising.

What's next?

We will look at historical data on sea level rise, temperature, ice volume, and potential causes of climate change. We will analyze this data to determine that carbon dioxide is the most likely cause of

			*current ice melt and will model how all the potential causes could affect climate.*
Lesson 2: What can the past help us figure out about what is causing sea level rise in the present? **Lesson 2 - C.1 Thermodyna…**  	**C.1 Lesson 2 Teacher Edition** **-(JIGSAW 1) ANALYZE HISTORICAL DATA** **C.1 Lesson 2 Teacher Refer…** **C.1 Lesson 2 Reading Ice C…** **C.1 Lesson 2 Reading Geolo…** **C.1 Lesson 2 Reading Clues…** **-CONSIDER HOW SCIENTISTS COLLECT DATA** **-(JIGSAW 2) CONSIDER DATA COLLECTION METHODS** **C.1 Lesson 2 Reference Ear…** **C.1 Lesson 2 Reference Ear…** **C.1 Lesson 2 Reference Yea…** **-ANALYZE AND INTERPRET DATA** **Data Analysis - Chalk Talk G…** **C.1 Lesson 2 Answer Key D…** **-GALLERY WALK**	**Learning Target:** I can evaluate new evidence and make an oral argument explaining how different energy sources and Earth system changes affect climate and sea level over time. **Success Criteria:** I will… • analyze and evaluate data showing how different energy sources and Earth system changes influence climate and sea level. • use evidence to revise or justify a model of sea-level rise. • construct an oral argument that explains and compares how these factors affect climate over short- and long-term timescales. **2.A** Evaluate the impact of new data showing indirect evidence of energy flows of changes in Earth's	**What students will wonder:** We look at historical data to see if sea level rise is new and whether people have experienced sea level rise like this before. We see that the sea level has been this high in the last million years, but maybe not recently. We also see that temperature and ice volume change somewhat with sea level. We read about how this and similar data were collected, then analyze data about potential causes using a Chalk Talk protocol, discuss the likely cause of current ice melt and sea level rise, and model how these different potential causes could affect climate. **What students will figure out:** • Over the last million years, global temperatures seem to increase around the same time that ice volumes decrease and sea levels increase.

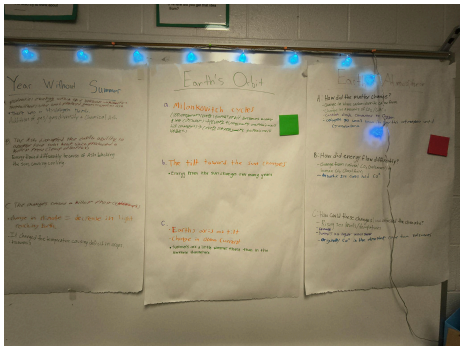
Slide K

Gallery Walk

In your notebook

Use one of the following sentence starters to make notes about each poster during the gallery walk.

- This poster made me think differently about **energy** because...
- This poster made me think differently about **matter** because...
- This poster made me think differently about **climate** because...



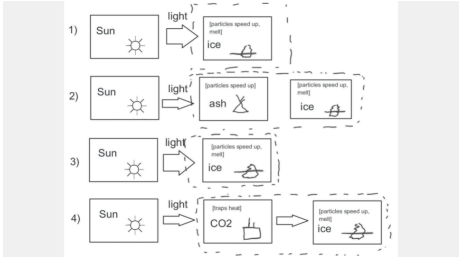
-EXIT TICKET

Exit Ticket-Data Analysis - D...

-CONSTRUCT AN ARGUMENT ABOUT THE CAUSE OF ICE MELT

-BUILDING UNDERSTANDINGS DISCUSSION

-MODEL ENERGY FLOWS



orbit, the Sun's energy output, volcanic activity, vegetation, and carbon dioxide on a working model of sea level rise. (SEP: 4.5; DCI: ESS1.B.2, ESS2.A.3, ESS2.D.2; CCC: 3.2, 5.2)

Learning Target: I can construct and present an oral argument explaining how different Earth and space factors cause climate to change over different timescales.

Success Criteria: I will…

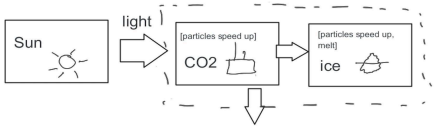
- identify factors that influence Earth's climate (Earth's orbit, the Sun's energy output, volcanic activity, vegetation, and carbon dioxide).
- describe how each factor affects climate (warming, cooling, or both).
- distinguish between short-term and long-term timescales of climate change.
- use evidence (data, graphs, models, or examples) to support my claims.
- construct a clear oral argument that includes a

- Scientists have to use indirect sources of evidence to figure out what Earth's climate was like in the past.
- Changes in sunlight due to Earth's orbit and tilt can affect climate.
- Changes in sunlight due to solar activity can affect climate.
- Volcanic activity can affect climate.
- Changes in carbon dioxide due to plant growth or human activity can affect climate and can help explain current temperature increases.
- Climate is impacted when something changes energy flows into or out of Earth systems, but it is unclear how carbon dioxide does that.

What's next?

We explored three coastal communities that are affected by rising sea levels and their responses to this global problem. We recognized that sea levels have been rising for over a hundred years and modeled ideas about the matter and energy changes that are causing sea

		claim, evidence, and reasoning. • explain cause-and-effect relationships between climate drivers and climate changes. • respond to questions or counterclaims using scientific evidence. **2.B** Construct an oral argument of how changes in Earth's orbit, the Sun's energy output, volcanic activity, vegetation, and carbon dioxide affect changes in climate over different timescales. (SEP: 7.4; DCI: ESS1.B.2, ESS2.A.3, ESS2.D.2; CCC: 7.2)	*levels to rise. We built a Driving Questions Board and gathered ideas for investigations.*
Lesson 3: How does carbon dioxide contribute to climate change? **Lesson 3 - C.1 Thermodyna…** 	**C.1 Lesson 3 Teacher Edition** **-BRAINSTORM IDEAS ABOUT CO2 AND TEMPERATURE** **-GENERATE IDEAS FOR INVESTIGATION** **-PLAN AN INVESTIGATION** **-MAKE A PREDICTION** **-PLAN DATA COLLECTION** **C.1 Lesson 3 Reference CO…** **-CONDUCT THE INVESTIGATION**	**Learning Target:** I can work with others to plan and test an investigation that shows how changes in carbon dioxide affect temperature in a model atmosphere. **Success Criteria:** I will… • work with my group to plan an investigation. • identify the variables in the investigation. • change the amount of carbon dioxide in the model.	**What students will wonder:** We investigate how increased CO2 in the atmosphere causes warmer temperatures using water bottles, digital thermometers, and CO2 from fizzing tablets. We outline variables we change, measure, and keep the same throughout the investigation. We collaboratively write directional hypotheses detailing what we think happens and design data tables to organize our collected evidence. Using our data, we model how energy stays in the atmosphere with more CO2 in the



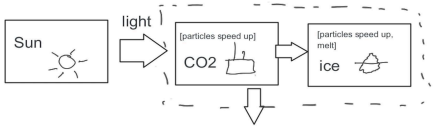
C.1 Lesson 3 Teacher Refer…

C.1 Lesson 3 Answer Key C…

Carbon Dioxide Investigation…

-SUMMARIZE INVESTIGATION FINDINGS

-BUILD CONSENSUS MODEL



-IDENTIFY IMPACTS OF CO2 ON EARTH SYSTEMS

-OBTAIN INFORMATION ABOUT ATMOSPHERIC GASSES

Atmospheric CO2 Reading - …

How is the Troposphere Hea…

-INTERPRET INFORMATION ABOUT ATMOSPHERIC GASSES

- observe and record temperature changes.
- describe the relationship between carbon dioxide and temperature.

3.A Collaboratively outline the variables and test an investigation to identify the directional relationship between the amount of carbon dioxide and temperature change in a defined model atmospheric system. (SEP: 3.1, 3.5; DCI: ESS2.D.3; CCC: 4.2)

Learning Target: I can develop a model to show how energy from the Sun moves through the atmosphere and cryosphere and how this affects Earth's climate.

Success Criteria: I will…

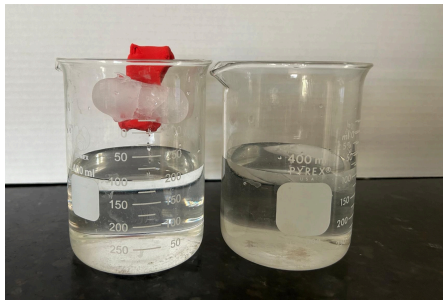
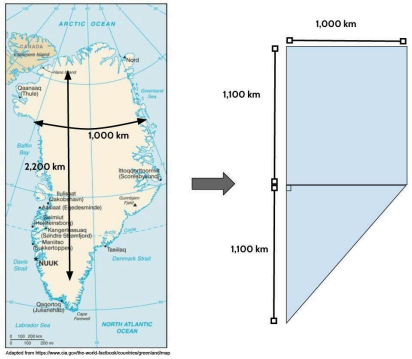
- identify where energy comes from (the Sun).
- show how energy moves through the atmosphere and cryosphere.
- explain what happens when energy is absorbed or reflected.
- use evidence to support my model.

system, causing warmer temperatures and sea level rise. We learn that CO2 concentrations in Earth's atmosphere are increasing rapidly. Because CO2 stays in the atmosphere for centuries, we want to find solutions to address impending sea level rise.

What students will figure out:

- The presence of carbon dioxide somehow enhances the rate of warming in a closed water bottle system, which we can use to model Earth's atmosphere.
- Energy that enters a system with more carbon dioxide is less likely to exit that system compared to a system with less carbon dioxide.
- Earth's atmosphere is a mixture of many different types of gases, including carbon dioxide.
- The concentration of carbon dioxide in Earth's atmosphere has increased rapidly over time. Because it can last in the atmosphere for a very long time, we need to find

		• explain how energy flow affects climate. **3.B** Develop a model based on evidence to predict how energy flows between the Sun, the atmosphere, and the cryosphere and how its absorption impacts climate. (SEP: 2.3; DCI: ESS2.D.1, PS3.B.2; CCC: 4.3) --- **Learning Target:** I can ask questions to better understand why models predict that global temperatures will keep rising even if carbon dioxide emissions stop. **Success Criteria:** I will… • identify the unexpected result in a climate model. • ask scientific questions about energy and matter conservation. • connect past carbon dioxide emissions to future temperature changes. • use models or data to help explain my questions. • revise my thinking based on new evidence. **3.C** Ask questions about the unexpected result that	another way to address sea level rise besides reducing CO_2 emissions. ***What's next?*** *We will develop and evaluate a mathematical model of the impact on sea level if Greenland and Antarctica's ice melted. We will plan and carry out an investigation to test the idea that sea ice may not affect sea levels. We will calculate the impacts of sea level rise.*

		conservation of energy and matter lead to models that predict that global temperatures will continue to rise on average even if carbon dioxide emissions stop. (SEP: 1.1; DCI: ESS2.D.4; CCC: 5.1)	
Lesson 4: What would happen if the Earth's ice melted? **Lesson 4 - C.1 Thermodyna…**   **C.1 Lesson 4 Teacher Refer…** **C.1 Lesson 4 Answer Key S…**	**C.1 Lesson 4 Teacher Edition** **-CREATE INITIAL MODEL ABOUT MELTING ICE** **-BEGIN TO DEVELOP A MATHEMATICAL MODEL** **Sea Level Calculations - Duffy** **Unit Conversion Word Problems** **-USE MATHEMATICAL MODEL TO CALCULATE VOLUME OF GREENLAND ICE** **-USE MATHEMATICAL MODEL TO CALCULATE VOLUME OF ANTARCTIC ICE** **Coastline Retreat From Sea-Level Rise Simulation | Sea Level | VESL | JPL | NASA** **-REFLECT ON OUR MATHEMATICAL MODEL** **-CALCULATE SEA LEVEL RISE FROM GREENLAND ICE MELT** **-CALCULATE SEA LEVEL RISE FROM ANTARCTICA ICE MELT**	**Learning Target:** I can use ratios and unit conversions to predict how human-caused ice melt affects sea level and people. **Success Criteria:** I will… • identify the quantities involved (ice melt, sea level change, population). • use ratios to compare changes at different scales. • convert units correctly (for example, ice volume to sea level rise). • make predictions about sea level rise using calculations. • explain how sea level rise impacts human populations. **4.A** Apply ratios and unit conversions at different scales to make predictions about the impact of human-caused ice melt on sea levels and human populations.	**What students will wonder:** We examine where ice is found on Earth's surface and make predictions and model what would happen if Earth's cryosphere melted. We develop a mathematical model to figure out the impact on sea level if Greenland and Antarctica's ice melted. We evaluate our answer using a simulation of sea levels and notice that the ice in the Arctic Ocean is not represented. We wonder if this ice affects sea levels, so we plan and carry out an investigation to see if ice in water affects the water level when it melts. We determine it does not, update our model, and calculate the human impacts of sea level rise. **What students will figure out:** • We estimate that if all of Greenland's land ice melted, Earth's sea levels would rise by almost 7 meters. If all of Antarctica's

	-PLAN AN INVESTIGATION FOR HOW MELTING ICE AFFECTS SEA LEVEL --- **-TAKE FINAL MEASUREMENTS** **C.1 Lesson 4 Teacher Refer…** **-SHARE AND MAKE SENSE OF THE RESULTS** **-REVISE OUR MODEL** **-CONSIDER THE HUMAN IMPACTS OF SEA LEVEL RISE** **-BRAINSTORM SOLUTIONS AND NAVIGATE**	(SEP: 5.5; DCI: ESS3.B.1, ESS3.D.1; CCC: 3.1) --- **Learning Target:** I can plan and conduct an investigation to improve a model that explains why melting sea ice does not raise sea level but can still cause other problems. **Success Criteria:** I will… • use a model to represent sea ice in the ocean system. • test what happens when sea ice melts. • revise the model based on what I observe. • explain why sea ice melt does not change sea level. • describe other negative effects of losing sea ice. **4.B** Plan and carry out an investigation to revise a model to reflect that sea ice is in the ocean system (hydrosphere) and therefore does not change sea level, though losing it might have other negative effects. (SEP: 3.1; DCI: ESS3.D.2; CCC: 4.2)	land ice melted, Earth's sea levels would rise by about 55 meters. • A sea level rise of 7 or 55 meters, or even 0.5 meter, would cause many major cities and other places to be covered by water for at least part of the year. • Earth's sea levels would not rise if Earth's sea ice melted, because this ice is already in the ocean. • We have initial ideas about ways that ice sheets could be prevented from melting. ***What's next?*** *We will analyze changes occurring over time at Ilulissat Glacier, a site of fast ice melt. We will read about two design solutions for slowing or preventing further melt. We will model the energy transfers and ask questions about the energy flows and overall suitability of the designs.*
INTERIM ASSESSMENT **(HS ESS3-5)**			

INTERIM ASSESSMENT

Interim Slides for students

LS1 Common Assessment:
Human Impact Assessment - Rio de Janeiro Transfer Task
Built in Canvas based on this google form

Study Guide built on Canvas using this:
C.1 Lesson 4 Handout Conversions Home Learning



Human Impact Assessment - Transfer Task MC KEY.pdf
C.1 Lesson 4 Answer Key Exit Ticket Key

Climate and Human Impact Assessment - LS1 Transfer Task ACC

Learning Target: I can use ratios and unit conversions to predict how human-caused ice melt affects sea level and people.

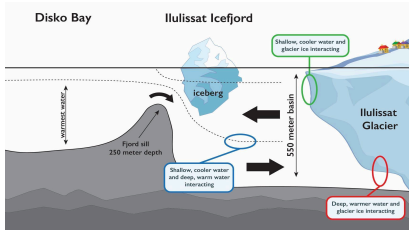
Success Criteria: I will…

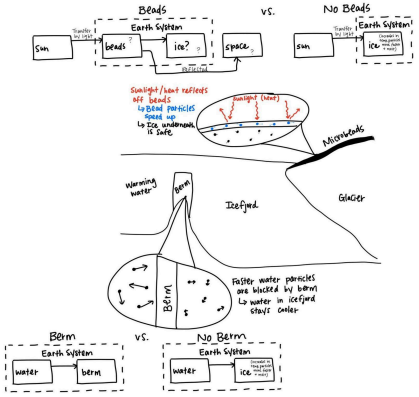
- identify the quantities involved (ice melt, sea level change, population).
- use ratios to compare changes at different scales.
- convert units correctly (for example, ice volume to sea level rise).
- make predictions about sea level rise using calculations.
- explain how sea level rise impacts human populations.

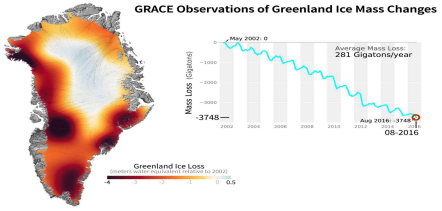
4.A Apply ratios and unit conversions at different scales to make predictions about the impact of human-caused ice melt on sea levels and human populations. (SEP: 5.5; DCI: ESS3.B.1, ESS3.D.1; CCC: 3.1)

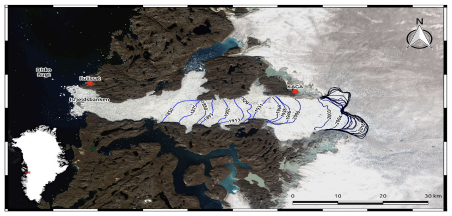
Learning Sequence 2: How can we Slow Polar Ice Melt? **Class Notes: LS2 - How can we slow Polar Ice Melt? Thermodynamics in Earth**

Lesson 5: How can we best slow or stop the land ice melt? **Lesson 5 - C.1 Thermodyna…**	**C.1 Lesson 5 Teacher Edition** **Duffy combined handout version of Lesson 5:** **-INTRODUCE THE ILULISSAT GLACIER CASE SITE AND ANALYZE CHANGES OCCURRING THERE**	**Learning Target:** I can ask questions to improve a model that shows how energy moves into, out of, and within a system when solutions are used to reduce glacier ice melt in Disko Bay. **Success Criteria:** I will…	**What students will wonder:** We analyze the changes occurring over time at a site of fast ice melt in Greenland (Ilulissat Glacier) using satellite images on video recordings of the glacier front. We read about two design solutions for slowing or preventing further









-LEARN ABOUT TWO PROPOSED SOLUTIONS

Ilulissat Design Solution Pro…

-MODEL THE PROPOSED SOLUTIONS

-SHARE IDEAS IN SMALL GROUPS

-INTRODUCE THE DISCUSSION MAPPING TOOL

-GO PUBLIC WITH IDEAS ABOUT PROPOSED SOLUTIONS

-REFINE THE MODEL TO INCLUDE ENERGY

-REFLECT ON OUR DISCUSSION MAPPING PROCESS

-ADD TO THE DRIVING

- use a model that shows energy transfer in the system.
- identify where energy enters, leaves, and moves within the system.
- ask questions about how proposed solutions change energy flow.
- focus my questions on glacier ice melt.
- use my questions to help refine the model.

5.A Ask questions to refine a model of the energy transfer into, out of, and within the system if proposed solutions prevent glacier ice melt in Disko Bay. (SEP: 1.4; DCI: PS3.B.2; CCC: 4.1)

Learning Target: I can use energy transfer models to ask questions about whether proposed design solutions are effective now and in the future.

Success Criteria: I will…

- use a consensus model of energy transfer.
- identify how the solution changes energy flow.

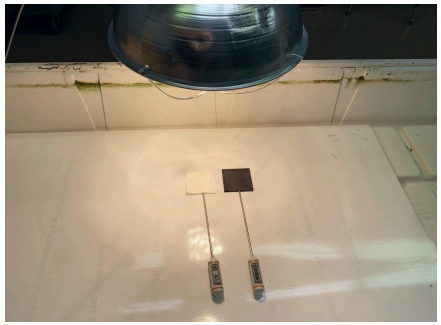
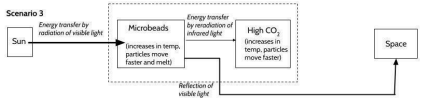
melt. We hear concerns from local rights holders and attempt to model the energy transfers that occur to make these solutions work. We ask questions about these energy flows and overall suitability of the designs.

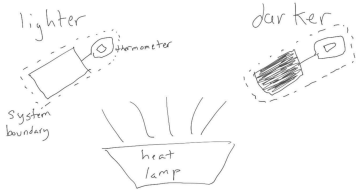
What students will figure out:

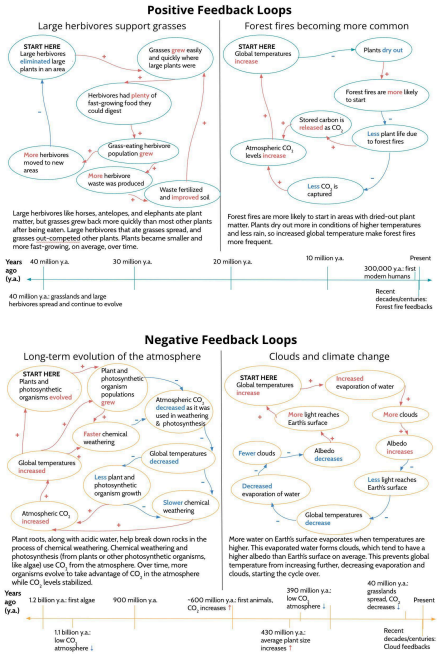
- The Ilulissat Glacier is the single largest flow of melt in Greenland. The front edge of the glacier has been receding over many decades.
- There are two proposed solutions. One is to build a huge underwater barrier between Disko Bay and Ilulissat Icefjord to prevent warm salty ocean water from coming into contact with the Ilulissat Glacier. The other is to spread thin layers of microbeads on Arctic ice in the summer months.
- Rights holders have concerns about the suitability of these designs and their potential impacts.

What's next?

We will plan and carry out an investigation to test our ideas

	QUESTION BOARD	• ask questions that challenge the solution's effectiveness. • consider both short-term and long-term impacts. • use evidence from the model to support my questions. **5.B** Use energy transfer consensus models to ask questions that challenge the suitability of the design solutions based on their current and future impacts. (SEP: 1.7; DCI: ESS3.D.1; CCC: 4.3)	*about how microbeads prevent ice melt. We will see that darker colors heat up more, and we will use a reading to help explain how carbon dioxide causes temperature increases and how microbeads work.*
Lesson 6: Why would some engineers want to sprinkle glass microbeads on the Arctic? **Lesson 6 - C.1 Thermodyna…**  	**C.1 Lesson 6 Teacher Edition** **Duffy combined handout version of Lesson 6:** **Light and Materials - Duffy** **-PLAN AN INVESTIGATION** **C.1 Lesson 6 Handout Light …** **-CARRY OUT AN INVESTIGATION** **-DISCUSS RESULTS FROM THE INVESTIGATION** **-READ ABOUT LIGHT AND MATERIALS** **C.1 Lesson 6 Reading Light …**	**Learning Target:** I can plan and carry out a safe investigation to show how the Sun's energy is reflected, absorbed, stored, and reradiated, and how this affects climate. **Success Criteria:** I will… • define the system boundaries for my investigation. • identify and control variables in the experiment. • observe how energy is reflected, absorbed, stored, and reradiated. • collect and record data safely.	**What students will wonder:** We plan an investigation to test our ideas about how microbeads prevent ice melt. Our teacher proposes a setup with a heat lamp shining on different colors of construction paper, and we discuss how to control variables and conduct the investigation safely. We see that darker colors heat up more. We read about light energy and discuss how what we read can explain both how carbon dioxide causes temperature increases and how the beads can help prevent melt. We use our model to make predictions, update our personal glossaries and

	**-DISCUSS THE LIGHT AND MATERIALS READING** **-MODEL THE EFFECTS OF CO2 AND MICROBEADS** **C.1 Lesson 6 Handout Revis…** **C.1 Lesson 6 Answer Key R…** **-MODEL HOW MICROBEADS WORK** **-USE OUR MODEL TO MAKE A PREDICTION** **-UPDATE PERSONAL GLOSSARIES AND PROGRESS TRACKERS** **-MAKE A CLAIM ABOUT MICROBEADS** **C.1 Lesson 6 Handout Micro…** **-REFLECT ON THE DECISION TO USE MICROBEADS**	• explain how these energy processes affect climate. **6.A** Plan and conduct a safe investigation with controlled variables and well-defined system boundaries to figure out how the reflection, absorption, storage, and reradiation of energy from the Sun affect climate. (SEP: 3.1, 3.3; DCI: ESS2.D.1, PS3.D.1; CCC: 4.2) --- **Learning Target:** I can use math to support a claim about whether microbeads are a good solution for preventing polar ice melt based on changes in energy flows and feedback loops. **Success Criteria:** I will… • identify how microbeads affect energy flows and feedback loops. • use data and calculations to support my claim. • make a clear argument about whether microbeads are an effective solution. • explain my reasoning using evidence from my calculations.	progress trackers, and reflect on who should get to decide to use microbeads. **What students will figure out:** • Light energy (radiation) causes dark materials to increase in temperature more than light materials. • Different materials absorb and reflect light energy differently. More reflective materials, like fresh ice or snow, have a high albedo. • There are different kinds of light, including infrared light. • When dark materials absorb visible light, their particles speed up and re-emit infrared light over time. • Carbon dioxide and other greenhouse gases transmit visible light, but absorb infrared light, trapping it in the Earth system. • A feedback loop could occur as additional carbon dioxide causes increased temperatures, which would melt ice, which would decrease the albedo of Earth's surface, which would cause more energy

		• consider both positive and negative impacts of the solution. **6.B** Use mathematical representations to support a claim about whether the changes in energy flows and disrupted feedback loops caused by microbeads make them a viable solution to help prevent polar ice melt. (SEP: 5.2; DCI: ESS2.A.1; CCC: 5.3)	to be absorbed. ***What's next?*** *We will discuss who should decide whether microbeads should be used to slow polar ice melt. We will read about feedback loops' impacts on the development of Earth systems. We will engage with a short mid-unit assessment and check in on our Driving Question Board.*
Lesson 7.a: How do feedback loops affect Earth's systems? **Lesson 7 - C.1 Thermodyna…** 	**C.1 Lesson 7 Teacher Edition** **-EXAMINE AN INFOGRAPHIC AND DISCUSS FEEDBACK LOOPS IN HISTORY** **C.1 Lesson 7 Reference Ear…** **Feedback loops go here?** **Feedback Cards** **Feedback Loops - Energy V…** **Climate Emergency Feedba…**	**Learning Target:** I can ask questions to understand how positive and negative feedback loops involving plants and other organisms affect Earth's systems. **Success Criteria:** I will… • identify examples of positive and negative feedback loops in Earth systems. • connect how plants and organisms interact with these feedback loops. • ask questions that clarify how feedback loops work. • use evidence from models or data to support my questions. **7.A** Ask questions to clarify the role of positive and negative	**What students will wonder:** We discuss who should decide whether microbeads should be used to slow polar ice melt. We have questions and concerns, many of them related to unpredictable feedback loops. We read about feedback loops and recognize that some have had profound impacts on the development of Earth systems and living things. We engage with a short mid-unit assessment and check in on our Driving Question Board. **What students will figure out:** • Earth's atmosphere and surface have changed significantly over time due to changes in living things,

		feedback loops involving the co-evolution of plants and other organisms with other Earth systems. (SEP: 1.4; DCI: ESS2.E.1, ESS2.D.2, ESS2.A.1; CCC: 7.3)	and changes in these systems impact living things in a feedback loop. ● A positive feedback loop is one where effects end up reinforcing the original cause, driving more change. A negative feedback loop is one where effects end up counteracting the original cause and limiting its impact. ● A positive feedback loop is not necessarily good and a negative one is not necessarily bad. ● One feedback loop is thawing permafrost releasing carbon dioxide, which can cause additional warming and permafrost thaw. ***What's next?*** *We will pose questions about where glacial ice meets ocean water, then learn from Inuit and NASA experts to formulate hypotheses about how proposed solutions would affect energy flows in the area. We will be puzzled to learn that the warmest water is at the bottom of the bay.*

LS2 Common Assessment:
Thawing Permafrost Transfer Task

Lesson 7.b: How do feedback loops affect Earth's systems?
Lesson 7 - C.1 Thermodynamics in Earth's Systems
C.1 Lesson 7 Teacher Edition



Built in Canvas using this:
C.1 Lesson 7 Assessment Thawing Permafrost Transfer
C.1 Lesson 7 Answer Key Thawing Permafrost Key

***NOTE: if given on canvas, students should be given a hardcopy of the feedback loop so that they can annotate.**

Permafrost Assessment - LS2 Transfer Task

Learning Target: I can ask questions to understand how positive and negative feedback loops involving plants and other organisms affect Earth's systems.

Success Criteria: I will…

- identify examples of positive and negative feedback loops in Earth systems.
- connect how plants and organisms interact with these feedback loops.
- ask questions that clarify how feedback loops work.
- use evidence from models or data to support my questions.

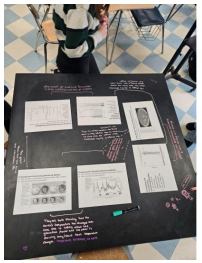
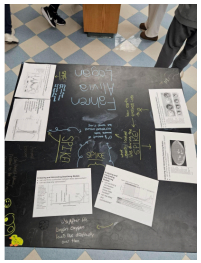
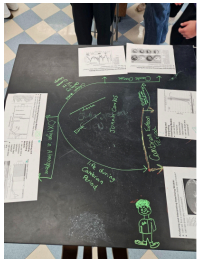
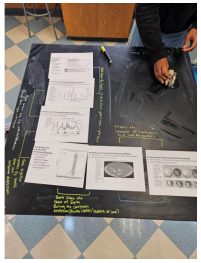
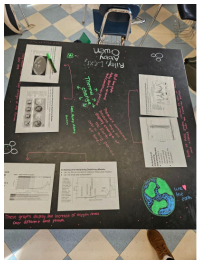
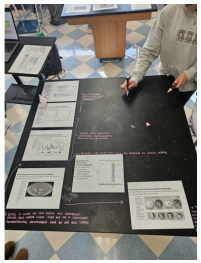
7.A Ask questions to clarify the role of positive and negative feedback loops involving the co-evolution of plants and other organisms with other Earth systems. (SEP: 1.4; DCI: ESS2.E.1, ESS2.D.2, ESS2.A.1; CCC: 7.3)

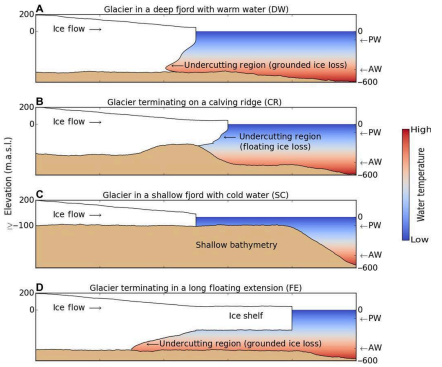
What students will wonder:
We discuss who should decide whether microbeads should be used to slow polar ice melt. We have questions and concerns, many of them related to unpredictable feedback loops. We read about feedback loops and recognize that some have had profound impacts on the development of Earth systems and living things. We engage with a short mid-unit assessment and check in on our Driving Question Board.

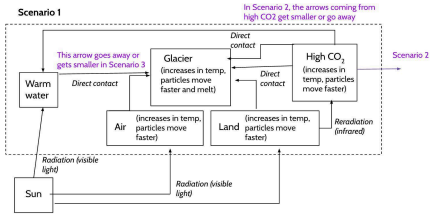
What students will figure out:

- Earth's atmosphere and surface have changed significantly over time due to changes in living things, and changes in these systems impact living things in a feedback loop.
- A positive feedback loop is one where effects end up reinforcing the original cause, driving more change. A negative feedback loop is one where effects end up counteracting the original cause and limiting its impact.
- A positive feedback loop is

			not necessarily good and a negative one is not necessarily bad. ● One feedback loop is thawing permafrost releasing carbon dioxide, which can cause additional warming and permafrost thaw. ***What's next?*** *We will pose questions about where glacial ice meets ocean water, then learn from Inuit and NASA experts to formulate hypotheses about how proposed solutions would affect energy flows in the area. We will be puzzled to learn that the warmest water is at the bottom of the bay.*
Learning Sequence 3: How well would the berm solution work? Class Notes: LS3 - How well would the berm soultion work?Melt? Ther			
Lesson 7.c: How can changes in Earth's systems create conditions for major changes in life on Earth?	**ENGAGE:** Narrative Introduction (Teach… Earth's Entire History (Visual… **EXPLORE:** Cambrian Explosion BTC Ac… Student examples:	**PE: HS-ESS2-7** **DCI: ESS2.D, ESS2.E** **Learning Target:** I can construct an evidenced based argument that explains how life and Earth's systems have changed together over time, influencing each other's evolution. **Success Criteria: I will…**	

	 2A   2A   1A  **Explain:** HS-ESS2-7 Assessment - W… **What Caused the Cambrian …** Extra Reading: CK12 Early Atmosphere and Oceans	• identify examples of how life has changed Earth's systems, and how Earth's systems have influenced the evolution of life. • explain the cause-and-effect relationships and feedbacks between living organisms and Earth systems. • analyze evidence (from data, models, or texts) to support an argument about the coevolution of life and Earth.	
Lesson 8: What is going on where the ice meets the water? **Lesson 8 - C.1 Thermodyna…**	**C.1 Lesson 8 Teacher Edition** **-ETHICALLY ENGAGE WITH INDIGENOUS KNOWLEDGE** **Inuit belief / AO** **Inuit Belief Highlights - Duffy** **C.1 Lesson 8 Handout Inuit …**	**Learning Target:** I can ask questions about changing ice, water, and land in the circumpolar region to help frame a hypothesis about energy and matter where	**What students will wonder:** We already know a lot about surface glacial melt and decide to explore the melt happening underneath. We pose questions about what might be going on





-REVIEW DATA FROM THE NASA OMG PROJECT

NASA's OMG: Where the W…

NASA OMG Project - Duffy

C.1 Lesson 8 Reference NA…

-REVISIT QUESTIONS AND FRAME HYPOTHESES

Revisiting Questions and Re…

C.1 Lesson 8 Handout Revis…

C.1 Lesson 8 Answer Key R…

glacial ice meets the ocean at Ilulissat.

Success Criteria: I will…

- observe and describe changes in ice, water, and land in the region.
- use Indigenous Inuit and/or NASA methods to guide my questions.
- ask questions that could be investigated in the field.
- connect my questions to energy and matter changes.
- use questions to help frame a testable hypothesis.

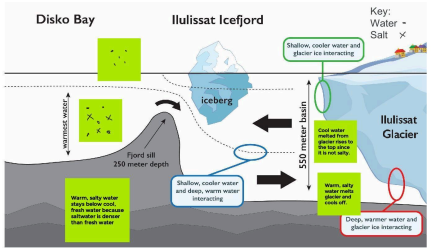
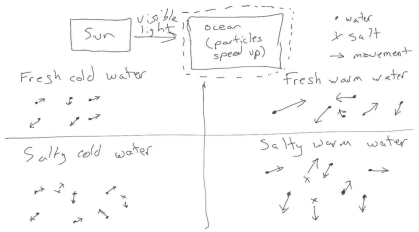
8.A Ask questions about the changing ice, waters, and lands of the circumpolar region that could be investigated in the field (using Indigenous Inuit and/or NASA methodologies) to frame a hypothesis about changes in energy and matter where glacial ice meets the ocean water at Ilulissat. (SEP: 1.6; DCI: ESS2.A.3; CCC: 5.2)

Learning Target: I can read and listen to scientific and technical information from Inuit Knowledge where glacial ice meets ocean water, then consider the information needed to answer our questions and how to gather it. We cannot go to Greenland ourselves but think we can learn from people there who already have systematically built this knowledge. We learn from Inuit and NASA experts, revisit our questions, and formulate hypotheses about how proposed solutions would affect energy flows. We are puzzled by data that suggest the warmest water is at the bottom of the bay.

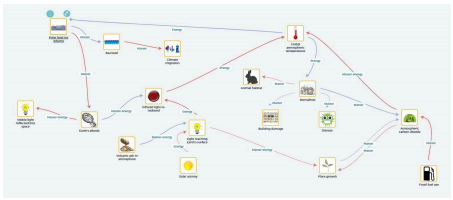
What students will figure out:

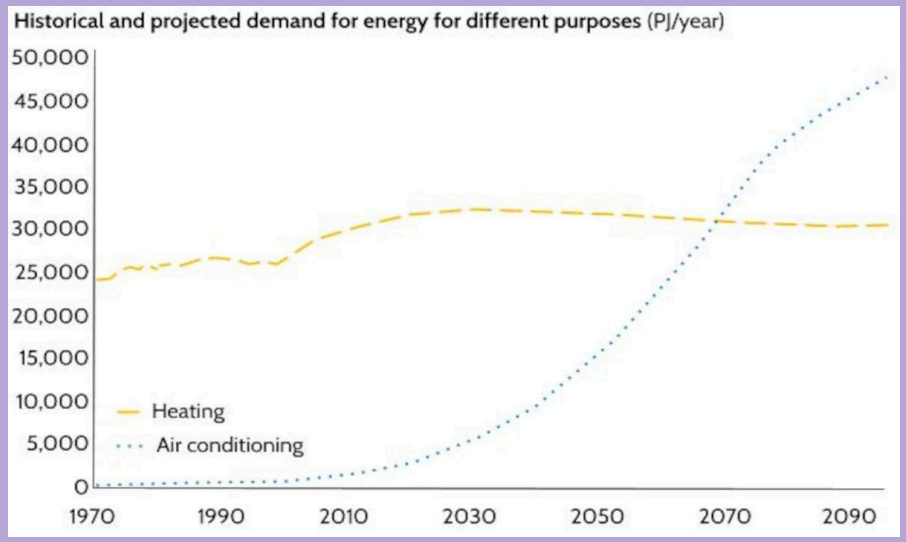
- In addition to surface melt and albedo effects, there are concerns about warming oceans driving glacial melt from below.
- Some questions are best answered through field-based investigations and experience.
- Indigenous Knowledge is a systematic way of thinking with its own purposes and methodologies, just as science is a systematic way of thinking with its own purposes and methodologies.

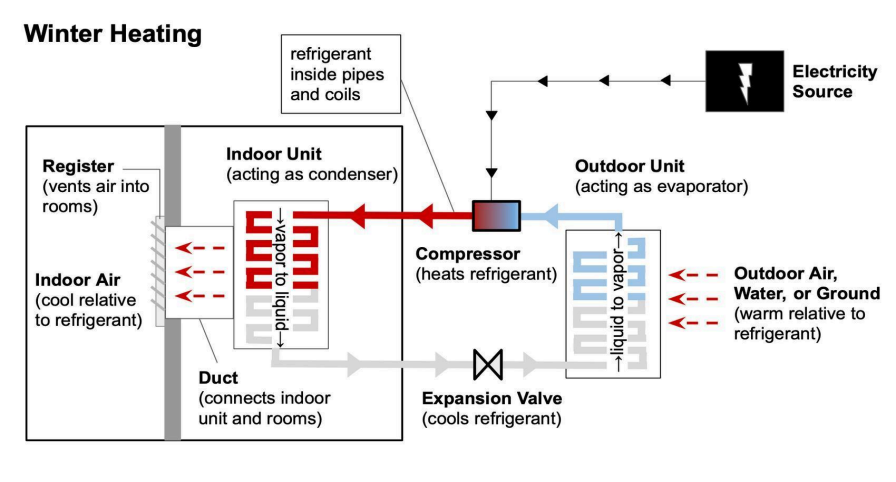
		and NASA research to analyze the Arctic system and compare different perspectives. **Success Criteria:** I will… ● identify boundaries, initial conditions, inputs, and outputs of the Arctic system. ● use information from Inuit Knowledge to describe the system. ● use information from NASA research to describe the system. ● compare how the two perspectives analyze the Arctic system. ● explain the usefulness of each perspective in understanding energy and matter flows. **8.B** Read and listen to scientific and technical information from two authoritative sources--Inuit Indigenous Knowledge and research from the NASA OMG Project--and consider the usefulness of describing and analyzing the boundaries, initial conditions, inputs, and outputs of the Arctic system from these different perspectives. (SEP: 8.3; DCI: ESS2.A.3; CCC: 4.2)	● Field-based investigations and experience can help people answer their questions, formulate hypotheses, and generate new questions. ● Both the berm solution and cutting carbon emissions could slow the transfer of energy at the interface between warm ocean water and glacial ice, through different mechanisms and on different timescales. ● Puzzlingly, the warmest ocean water is at the bottom of the bay. ***What's next?*** *We will develop particle-level and energy models of water at different temperatures and salinities. We will collect data on the mass and volume of water under these different conditions and calculate its density. We will revise our models and explain how berms decrease energy transfer to the glacier.*

Lesson 9: Why does warm salty water sink to melt a glacier? **Lesson 9 - C.1 Thermodyna…**  	**C.1 Lesson 9 Teacher Edition** **Duffy combined handout version of Lesson 9:** **-NAVIGATE** **Brainstorm ideas about why liquids float or sink.** **-MODEL PARTICLES IN DIFFERENT LIQUIDS**  **-PLAN AN INVESTIGATION** **-INVESTIGATE MASS AND VOLUME** **C.1 Lesson 9 Class Data Ta…** **-PRODUCE LINES OF BEST FIT AND INTERPRET OUR RESULTS** **C.1 Lesson 9 Class Data Ta…** **-CALCULATE DENSITY** **Discuss best-fit lines, consider limitations of the mathematical models, and calculate slope using Google Sheets.** **C.1 Calculating Density in G…** **C.1 Graphing in Google She…**	**Learning Target:** I can evaluate a question about ocean energy circulation to see if it can be tested and choose the right tools to collect and record data. **Success Criteria:** I will… • determine if a question is testable. • identify predicted energy flows in the ocean system. • select appropriate tools to collect and record data. • explain why the tools and methods are suitable for the investigation. • plan steps to investigate ocean energy circulation safely and effectively. **9.A** Evaluate a question about the energy circulation in the ocean to see if it is testable and select appropriate tools to collect and record data in an investigation, considering predicted energy flows within the ocean system. (SEP: 1.5, 3.4; DCI: ESS2.D.1; CCC: 5.4)	**What students will wonder:** We wonder why cool water is on top of warm salty water. We develop initial particle-level and energy models of water at different conditions (warm fresh, cold fresh, warm salty, and cold salty) and collect data on its mass and volume . We graph our individual and class data, determine lines of best fit, and calculate the density of water under these different conditions. We revise our initial models, explain how berms decrease energy transfer to the glacier, and complete an exit ticket. **What students will figure out:** • Though density is a property for a substance at room temperature, increased energy tends to increase the distance between particles and thus decrease the density of the particles that make up that substance. • Density of a substance (or a sample) is its mass per unit volume. • When denser fluids are

	-INTRODUCE SIGNIFICANT FIGURES **Reading Significant Figures -…** **C.1 Lesson 9 Reading Signif…** **-CARRY OUT A SECOND INVESTIGATION** **-UPDATE INITIAL PARTICLE MODELS FROM DAY 1** **-UPDATE PROGRESS TRACKERS** **-MODEL ENERGY TRANSFER** **-EXIT TICKET** **https://docs.google.com/forms/d/1kAZBHTqV9ml57xxp-GgkoGeYvt-aYWD1TpzGgdsRDDU/copy**	**Learning Target:** I can use data and models to identify how density changes affect energy circulation in the ocean. **Success Criteria:** I will… ● apply function fits to data to see patterns. ● consider the limitations of the data and analysis. ● evaluate how reliable a model is. ● connect changes in density to changes in energy circulation. ● use evidence from data and models to support my conclusions. **9.B** Apply function fits to data, consider limitations of data analysis, and consider model reliability to identify density as altering expected patterns of energy circulation in the ocean. (SEP: 4.2, 4.3; DCI: ESS2.D.1; CCC: 4.4)	added above less dense fluids, the denser fluids sink. ● When denser fluids are moved beneath less dense fluids, they tend to remain separated and flow independently of each other. ● Changes in energy and matter happen together, including in convection, when energy transfers as substances move. ***What's next?*** *We will plan and carry out an investigation to figure out if we can measure energy transfer between warm and cool water. From graphs, we will gain some additional evidence that energy is conserved. We will use a simulation to develop a mathematical model of energy transfer through conduction.*
Lessons 10-12 copied at the end- not appropriate for freshmen?			
Lesson 13.a: How can we model what will happen to Earth's climate if humans make changes?	**C.1 Lesson 13 Teacher Edition** **-READ ABOUT AND DISCUSS CLIMATE MODELING**	**Learning Target:** I can ask questions to figure out relationships in a predictive climate model, knowing that new	

	**Modeling the Climate - Duffy** **-GET TO KNOW THE COMPUTATIONAL MODEL** **Earth System Model Simulation** **-ASK QUESTIONS THAT CAN BE ANSWERED USING THE MODEL** **Give students time to develop questions that can be tested using the model.** **-TEST QUESTIONS THAT CAN BE ANSWERED USING THE MODEL** **Give students time to develop questions that can be tested using the model, then test them.** **-SHARE RESULTS FROM THE COMPUTATIONAL MODEL** **Discuss what students saw in their tests.** **-REFLECT ON WHAT WE HAVE ACCOMPLISHED** **Revisit the DQB as a class and take stock of all of the questions we have now answered.**	discoveries may change our understanding and that average global temperatures are expected to rise. **Success Criteria:** I will… • identify relationships between variables in the model. • ask questions about the model's limitations. • use a computational model to support claims about how energy and matter move in complex systems. • consider how new discoveries might change predictions. • connect the model to expected trends in global temperatures. **13.A** Ask questions to determine relationships in a predictive but limited model considering that new discoveries are always being made and that climate models suggest average global temperatures will continue to rise. (SEP: 1.3; DCI: ESS3.D.2, ESS2.D.4; CCC: 4.4) **13.B** Use a computational model to support claims about the impacts of energy and matter	

		flows amid complexity. (SEP: 5.2; DCI: ESS2.D.4; CCC: 4.3)	
Common Assessment: **-LS3 Summative Assessment: Heat Pumps Transfer Task** Lesson 13.b: How can we model what will happen to Earth's climate if humans make changes? **Lesson 13 - C.1 Thermodynamics in Earth's Systems** **C.1 Lesson 13 Teacher Edition** C.1 Lesson 13 Answer Key Heat Pumps Key HVAC Assessment - LS3 Transfer Task  	**Learning Target:** I can plan an investigation to find a problem with energy transfer in a geothermal heating system. **Success Criteria:** I will… • identify the components of the geothermal system. • define the energy transfer processes in the system. • plan steps to investigate potential problems. • control variables and define system boundaries for the investigation. • record observations and data to identify energy transfer issues. **13.C** Plan an investigation to identify a problem with energy transfer in the geothermal heating system. (SEP: 3.5, 3.2; DCI: PS3.B.2, PS3.B.5, PS3.D.1; CCC: 4.2)	**What students will wonder:** We return to our Gotta-Have-It Checklist for the unit computational model and realize that the model is fairly complicated, so we need to think more about how climate modeling works. We read about how scientists carry out and use climate modeling. We use this understanding to develop questions we can ask of our computational model, then test them. We discuss our results and reflect on how they make us feel. We close out our Driving Question Board and complete a transfer task focused on indoor heating in a changing climate. **What students will figure out:** • Climate models work using equations for energy and matter transfer like those we developed. • They are based on assumptions and are therefore not perfectly predictive. • Models are improved as

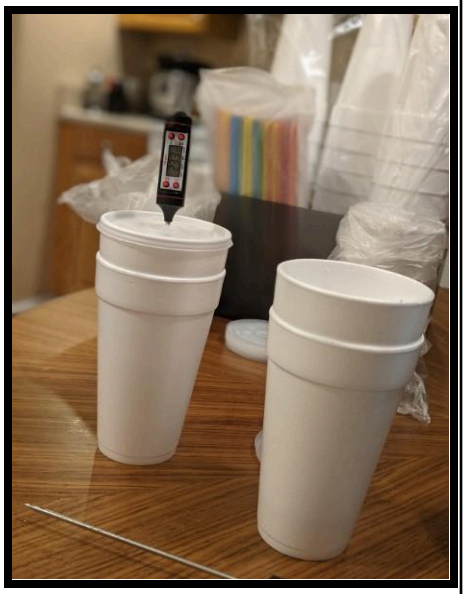


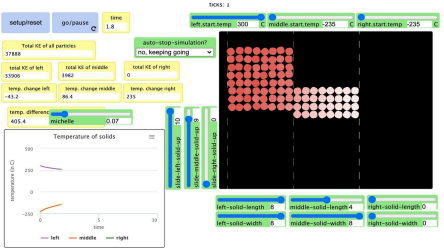
scientists get new information.

- Climate models agree that Earth will continue to warm significantly if no changes are made.
- Our computational model shows that solutions that decrease carbon dioxide in the atmosphere or energy reaching Earth's surface could prevent some sea level rise and its negative impacts on people.
- Heat pumps provide a possible solution to help limit carbon dioxide emissions while keeping homes safe and comfortable.

What's next?
END OF UNIT.

~~**Not Appropriate at the freshmen level**~~

Lesson 10: How can we measure the energy transfer a berm prevents? **Lesson 10 - C.1 Thermodyn…** 	**C.1 Lesson 10 Teacher Edition** **-PLAN AN INVESTIGATION FOR LIQUID-LIQUID ENERGY TRANSFER INTERACTIONS** **-SET UP THE EXPERIMENTAL CONDITIONS** **-COLLECT AND SHARE DATA** **C.1 Lesson 10 Liquid-Liquid …** **-HAVE A BUILDING UNDERSTANDINGS DISCUSSION** **-PREDICT TEMPERATURE CHANGES** **Build a mathematical model that can be used to predict temperature changes.** **Summarizing Our Investigati…** **-MAKE SENSE OF THE AREAS**	**Learning Target:** I can plan and carry out investigations to measure energy transfer between objects and show how energy is conserved. **Success Criteria:** I will… • plan an investigation with clear steps. • identify objects and variables involved in energy transfer. • measure energy transfer between objects. • record and analyze data accurately. • explain how my results show energy conservation. **10.A** Plan and conduct investigations of energy transfer between objects in order to quantify conserved energy. (SEP: 3.2; DCI: PS3.A.1; CCC: 5.3)	**What students will wonder:** We plan and carry out an investigation to figure out if we can measure energy transfer between warm and cool water. We try to mathematically model our results using graphs and gain some additional evidence that energy is conserved. We need more information about what this looks like at a particle level, so we conduct an initial investigation with a simulation. We then use the simulation to develop a mathematical model of energy transfer through conduction. This model includes the new idea of specific heat. **What students will figure out:** • This is what happens when two objects/samples at different temperatures are in contact with one another: • Energy transfer between



$$Q = c_p \cdot m \cdot \Delta T$$

Energy transferred = c_p · mass · temperature change
(calories) (grams) (°C)

Substance or Mixture	Specific heat, c_p calories / (g · °C)
Dry air	0.24
Limestone	0.22
Sand	0.20
Copper	0.09
Water	1.00

-INTRODUCE A SIMULATION

C.1 NetLogo Simulation Orie…

-CARRY OUT AN INITIAL INVESTIGATION

-Simulation #1: Energy Transfer Between Solids

-SHARE OBSERVATIONS FROM THE INITIAL INVESTIGATION

-HOME LEARNING

-INTRODUCE UPDATED SIMULATION

-Simulation #2: Energy Transfer Between Different Substances

-PLAN AN INVESTIGATION

-CARRY OUT AN INVESTIGATION WITH THE SIMULATION

C.1 Lesson 10 Class Simulat…

C.1 Lesson 10 Sample Clas…

-HAVE A BUILDING UNDERSTANDINGS DISCUSSION

As a class, have students share their findings and build a quantitative model to represent the relationship between mass, temperature change, and energy transfer in the system.

Learning Target: I can test a simulation of a closed system to see how energy and matter are conserved and how objects of different temperatures reach the same energy distribution.

Success Criteria: I will…

- set up a simulation of a closed system.
- apply simple limit cases to test the simulation.
- observe how energy moves between objects.
- explain how the system reaches uniform energy distribution.
- connect my observations to energy and matter conservation.

10.B Use simple limit cases to test a simulation of a closed system in which energy and matter are conserved that shows how an uncontrolled system with two different-temperature objects eventually reaches uniform energy distribution. (SEP: 5.4; DCI: PS3.B.5; CCC: 5.1)

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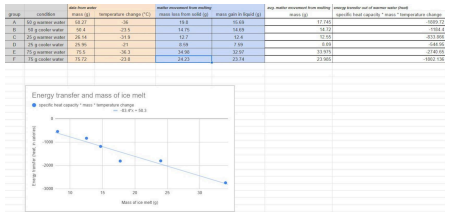
two objects/samples initially at different temperatures will cause both to eventually reach the same final temperature, which will be between the initial temperatures.

- The mass and temperature of each sample affects where the final temperature stabilizes (ΔT depends on m).
- Energy is conserved. It flows between the objects but is not created or destroyed.
- Conduction is the transfer of energy through direct contact as particles collide.
- The specific heat (c) of a substance or mixture tells us how much energy in calories is needed to change 1 gram of it by 1 °C.
- Heat transfer Q into or out of a substance can be found by multiplying the specific heat, mass, and temperature change.

		Learning Target: I can use algebra and functions to quantify and model energy flows that cause temperature changes and show energy is conserved. **Success Criteria:** I will… • calculate energy transferred that causes temperature changes. • model energy flow mathematically. • show how energy is conserved in my calculations. • use data to support my mathematical models. **10.C** Apply techniques of algebra and functions to quantify, describe, and mathematically model the energy flows that result in measurable temperature changes in order to quantify conserved energy. (SEP: 5.3; DCI: PS3.B.3; CCC: 4.3)	***What's next?*** *We will realize that we do not know all the factors that affect the amount of ice melt, so we will plan and conduct an investigation to measure how heat and mass are related. We will consider how our results might help us address glacier melt and sea level rise.*
Lesson 11: How does heat affect the amount of ice melt? **Lesson 11 - C.1 Thermodyn…**	**C.1 Lesson 11 Teacher Edition** **Duffy combined handout version of Lesson 11:** **-NAVIGATE** **Reorient students to calculating the energy transfer the berm prevents.**	**Learning Target:** I can **Success Criteria:** I will… **11.A** Ask questions based on an existing model around how energy causes matter cycling in a system	**What students will wonder:** We reflect on where our new heat equation fits into our energy transfer model. We realize that we do not know what affects the amount of ice melt other than incoming heat, so we plan and conduct an investigation in which





-DEVELOP AN INVESTIGATION QUESTION

Investigation Question Devel…

C.1 Lesson 11 Answer Key I…

Give students time to brainstorm and decide on an investigation question.

-PLAN AN INVESTIGATION TO COMPLETE OUR MATHEMATICAL MODEL

C.1 Lesson 11 Water-Ice Cla…

Review the investigation procedure and co-construct a modified spreadsheet to collect class data.

-COLLECT AND SHARE DATA

Carry out the investigation and share results in the class data table.

Water-Ice Investigation Proc…

-MAKE SENSE OF THE RESULTS

Construct a line of best fit and discuss what its slope means.

-NAVIGATE

Have students update their Progress Tracker to support navigation to the next lesson.

with conserved and transferred energy. (SEP: 1.2; DCI: PS3.B.1; CCC: 5.4)

Learning Target: I can ask questions about how energy moves and causes matter to cycle in a system where energy is conserved and transferred.

Success Criteria: I will…

- look at an existing model of energy and matter cycling.
- identify where energy is conserved and transferred.
- ask questions about how energy affects matter movement.
- use my questions to clarify or improve the model.

11.B Make a directional hypothesis about how much energy transfer must be prevented as part of a system design. (SEP: 3.5; DCI: PS3.B.1; CCC: 4.1)

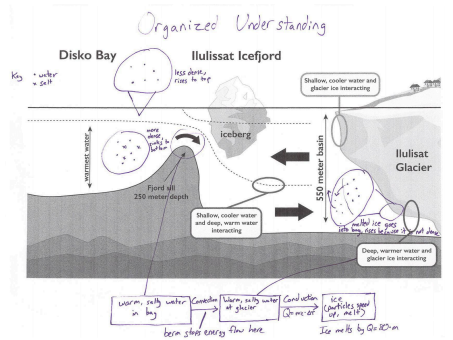
we measure both the temperature change of the water and the mass change of the melting ice. We figure out from the slope of the best-fit line of the data that 80 calories of energy are required to melt 1 gram of ice. We consider how this understanding might help us in addressing glacier melt and sea level rise.

What students will figure out:

- Because energy is conserved, the heat that transfers out of the water in our investigation flows to the ice.
- 80 calories of energy are required to melt 1 gram of ice ($Q = 80 \cdot m$).
- We can use our mathematical model to predict the amount of ice melt when we know the mass and temperature of the water it is in contact with.

What's next?

We will develop a Gotta-Have-It Checklist and mathematical model that can help us further evaluate the berm solution. We will use the model to calculate the berm's impact on ice melt. We will

			brainstorm ideas for an expanded computational model that includes the Earth system beyond the glacier.
Lesson 12: How can we slow the flow of energy on Earth to protect vulnerable coastal communities? **Lesson 12 - C.1 Thermodyn…**   	**C.1 Lesson 12 Teacher Edition** **-BUILD A GOTTA-HAVE-IT CHECKLIST** **Handout Berm Model - Duffy** **-DEVELOP A MATHEMATICAL MODEL** **-BUILD A CONSENSUS MODEL** **-USE THE MATHEMATICAL MODEL** **Calculating Berm Impact - D…** **-DISCUSS AND PROBLEMATIZE THE RESULTS** **-BUILD A UNIT GOTTA-HAVE-IT CHECKLIST** **Unit Gotta-Have-It Checklist …** **-COMPLETE AN EXIT TICKET**	**Learning Target:** I can use different types of models to predict how a berm will affect energy and matter flows. **Success Criteria:** I will… • create a checklist for a computational model that predicts how human use of resources affects a defined system. • show how energy and matter move in the system. • predict changes caused by adding a berm. • use mathematical models and unit conversions to support a claim about changes in sea level, using energy conservation to help explain it. **12.A** Use multiple types of models of changes in energy and matter flows in order to predict the impact of a berm. (SEP: 2.4; DCI: ESS3.D.1; CCC: 5.2) --- **12.B** Support a claim with mathematical models, including	**What students will wonder:** We develop a Gotta-Have-It Checklist of ideas to include in a mathematical model that can help us further evaluate the berm solution. We develop this mathematical model, then use it to calculate the berm's impact on ice melt. We recognize that this model does not reflect all the ideas we figured out or the solutions we examined in the unit, so we brainstorm ideas for an expanded computational model that includes the Earth system beyond the glacier. **What students will figure out:** • We can build a mathematical model that will allow us to figure out how much ice melt the berm can prevent. • About 3.35 x 10^{18} calories of energy are being transferred into the Ilulissat Glacier system to cause the amount of ice melt that produces the yearly amount of meltwater

		unit conversions involving quantified changes in sea level, using energy conservation as a tool. (SEP: 5.2, 5.5; DCI: PS3.A.1; CCC: 7.2) --- **12.C** Create a checklist for a computational model that can predict how a defined system is influenced by resource availability and use by humans. (SEP: 5.1; DCI: ESS3.A.1; CCC: 4.2)	coming off the Ilulissat Glacier. ● About 5 x 10^{18} calories of annual energy flow into the Ilulissat Glacier system could be prevented by the proposed berm solution, so the berm could theoretically stop glacier melt at that location. ● We can expand our model to include a larger system (i.e., on the global scale, rather than the scale of a particular glacier). ***What's next?*** *We will read about how scientists model climate. We will use this understanding to develop and test questions with our unit computational model. We will discuss and reflect on our results. We will close out our Driving Question Board and complete a transfer task focused on indoor heating in a changing climate.*

Climate Change and Human Impact



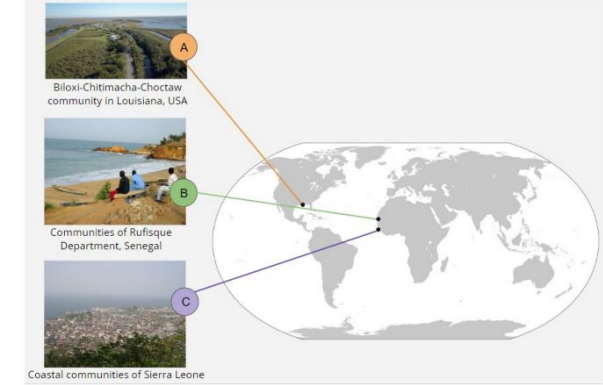
Accelerated Earth Science Course-Unit 2

Written by Jaime Hatch & Kelsey Duffy
Presentation Created by Nicole Raccio
October 21, 2026

Unit 2:
Climate Change and Human Impact

Students will explore why sea level is changing, causing people to relocate. They will conduct investigations that help students better understand the matter and energy flows that underlie a global phenomenon like polar ice melt and sea level rise.

Students figure out how decreasing carbon dioxide emissions and two geoengineering solutions (applying glass microbeads to polar ice and protecting glaciers from warm water with berms) could help slow polar ice melt, protecting coastal communities.

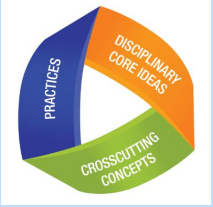


Coastal locations are noticing sea level rise due to local and global causes, which are forcing some communities to move.

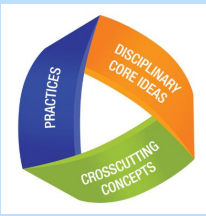
Main Standards Assessed



- **HS-PS3-1**† Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flow in and out of the system are known.
- **HS-PS3-4** Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperatures are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).
- **HS-ESS2-2** Analyze geoscience data to make the claim that one change to Earth's surface can create feedback that causes changes to other Earth systems.
- **HS-ESS3-5** Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts on Earth systems.



SEPs, DCIs, & CCCs



Science & Engineering Practices (SEP)

- Using Mathematics and Computational Thinking
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data

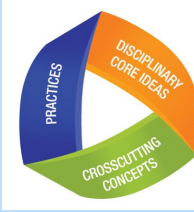
Disciplinary Core Ideas (DCI)

- PS3.A: Definitions of Energy
- PS3.B: Conservation of Energy and Energy Transfer
- PS3.D: Energy in Chemical Processes
- ESS2.A: Earth Materials and Systems
- ESS2.D: Weather and Climate
- ESS3.D: Global Climate Change

Crosscutting Concepts (CCC)

- System and System Models
- Stability and Change

Learning Sequence 1: Why is Sea Level Rising?



Lesson Level Question:

- How are sea levels rising and forcing people to move?
- What can the past help us figure out about what is causing sea level rise in the present?
- How does carbon dioxide contribute to climate change?
- What would happen if the Earth's ice melted?

Learning Objectives

- I can ask questions and develop a model to explain how changes in sea level affect human migration by tracking energy and matter through Earth systems.
- I can evaluate new evidence and make an argument explaining how different energy sources and Earth system changes affect climate and sea level over time.
- I can construct and present an argument explaining how different Earth and space factors cause climate to change over different timescales.
- I can plan and conduct an investigation that shows how changes in carbon dioxide affect temperature in a model atmosphere.
- I can develop a model to show how energy from the Sun moves through the atmosphere and cryosphere and how this affects Earth's climate.
- I can ask questions to better understand why models predict that global temperatures will keep rising even if carbon dioxide emissions stop.
- I can use ratios and unit conversions to predict how human-caused ice melt affects sea level and people.
- I can plan and conduct an investigation to improve a model that explains why melting sea ice does not raise sea level but can still cause other problems.



Assessment:

Human Impact Assessment - Rio de Janeiro Transfer Task

Learning Target: I can use ratios and unit conversions to predict how human-caused ice melt affects sea level and people.

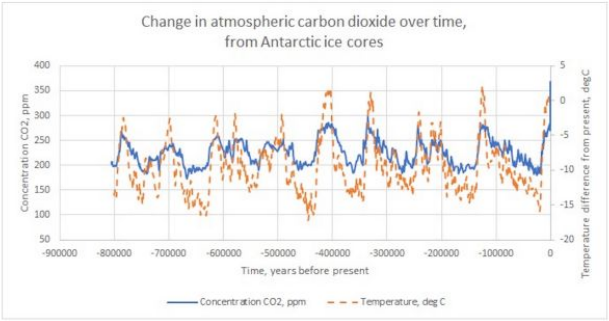
Success Criteria: I will…

- identify the quantities involved (ice melt, sea level change, population).
- use ratios to compare changes at different scales.
- convert units correctly (for example, ice volume to sea level rise).
- make predictions about sea level rise using calculations.
- explain how sea level rise impacts human populations.

- ❖ Scale, Proportion, and Quantity
- ❖ Mathematical Thinking

What students figure out

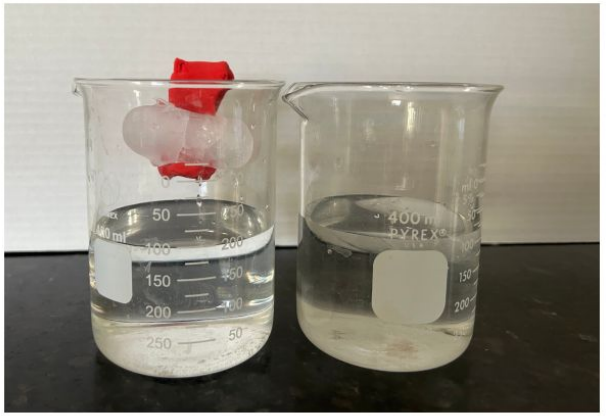
❖



Sea level tends to increase as temperature increases and polar ice melts. Various factors can affect Earth's climate, but only carbon dioxide can impact it at the timescales we observe.

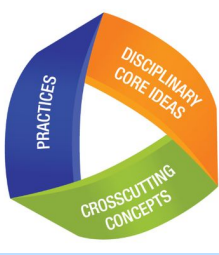


In the closed water bottle system, bottles containing more CO2 see a greater increase in temperature under a heat lamp.



Data about Greenland's and Antarctica's size allow us to calculate how much water the melting ice would add to the world's oceans and we investigate whether both land ice and sea ice raise sea levels.

Learning Sequence 2: How can we Slow Polar Ice Melt?



Lesson Level Questions

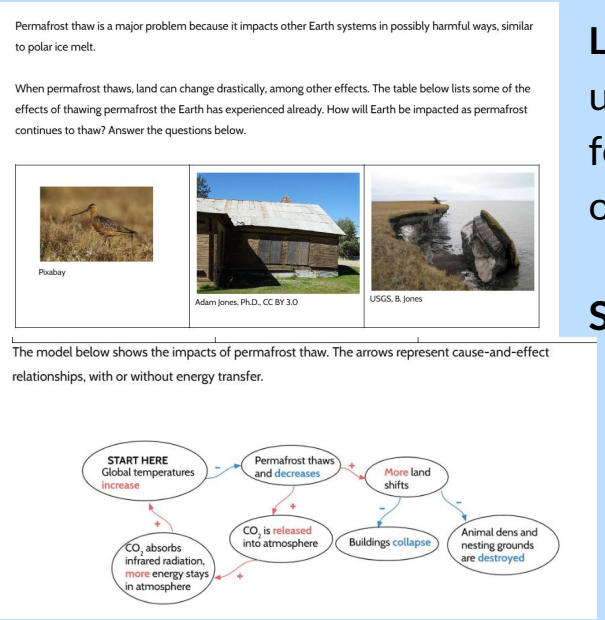
- How can we best slow or stop the land ice melt?
- Why would some engineers want to sprinkle glass microbeads on the Arctic?
- How do feedback loops affect Earth's systems?
- How do feedback loops affect Earth's systems?

Learning Targets

- I can ask questions to improve a model that shows how energy moves into, out of, and within a system when solutions are used to reduce glacier ice melt in Disko Bay.
- I can use energy transfer models to ask questions about whether proposed design solutions are effective now and in the future.
- I can plan and carry out an investigation to show how the Sun's energy is reflected, absorbed, stored, and reradiated, and how this affects climate.
- I can use math to support a claim about whether microbeads are a good solution for preventing polar ice melt based on changes in energy flows and feedback loops.
- I can ask questions to understand how positive and negative feedback loops involving plants and other organisms affect Earth's systems.

Assessment:

Thawing Permafrost Transfer Task



Permafrost thaw is a major problem because it impacts other Earth systems in possibly harmful ways, similar to polar ice melt.

When permafrost thaws, land can change drastically, among other effects. The table below lists some of the effects of thawing permafrost the Earth has experienced already. How will Earth be impacted as permafrost continues to thaw? Answer the questions below.

Pixabay

Adam Jones, Ph.D., CC BY 3.0

USGS, B. Jones

The model below shows the impacts of permafrost thaw. The arrows represent cause-and-effect relationships, with or without energy transfer.

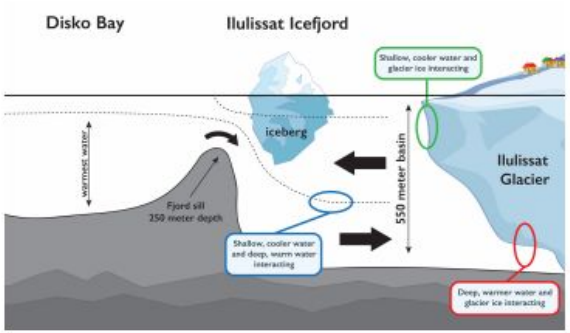
Learning Target: I can ask questions to understand how positive and negative feedback loops involving plants and other organisms affect Earth's systems.

Success Criteria: I will…

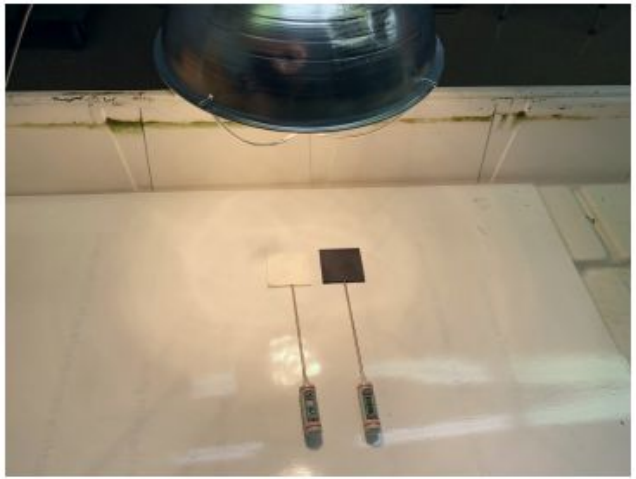
- identify examples of positive and negative feedback loops in Earth systems.
- connect how plants and organisms interact with these feedback loops.
- ask questions that clarify how feedback loops work.
- use evidence from models or data to support my questions.

- ❖ Stability and Change
- ❖ Asking Questions and Defining Problems

What students figure out



The Ilulissat Glacier has lost a lot of ice mass and has visibly retreated over the past few decades. Scientists have proposed two potential geoengineering solutions to slow the rate of melting at this location — building an underwater berm, or spreading thin layers of microbeads on ice during the summer.

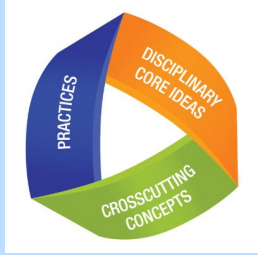


Different colors of construction paper increase in temperature differently under a heat lamp.



Many changes in Earth systems, like increased warming due to melting ice and permafrost releasing CO2 that speeds warming, are due to feedback loops.

Learning Sequence 3: How well would the berm solution work?



Lesson Level Questions

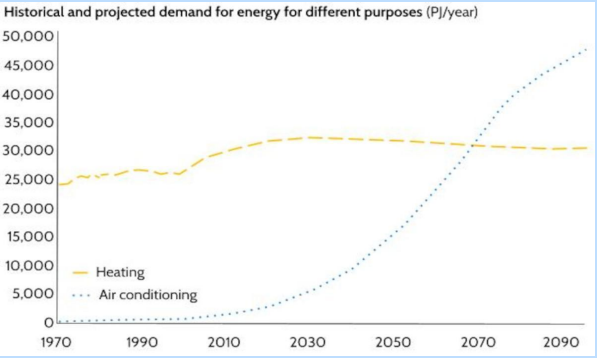
- How can changes in Earth's systems create conditions for major changes in life on Earth?
- What is going on where the ice meets the water?
- Why does warm salty water sink to melt a glacier?
- How can we model what will happen to Earth's climate if humans make changes?
- How can we model what will happen to Earth's climate if humans make changes?

Learning Targets

- I can construct an evidenced based argument that explains how life and Earth's systems have changed together over time, influencing each other's evolution.
- I can ask questions about changing ice, water, and land in the circumpolar region to help frame a hypothesis about energy and matter where glacial ice meets the ocean at Ilulissat.
- I can read and listen to scientific and technical information from Inuit Knowledge and NASA research to analyze the Arctic system and compare different perspectives.
- I can use data and models to identify how density changes affect energy circulation in the ocean.

Assessment:

Heat Pumps Transfer Task



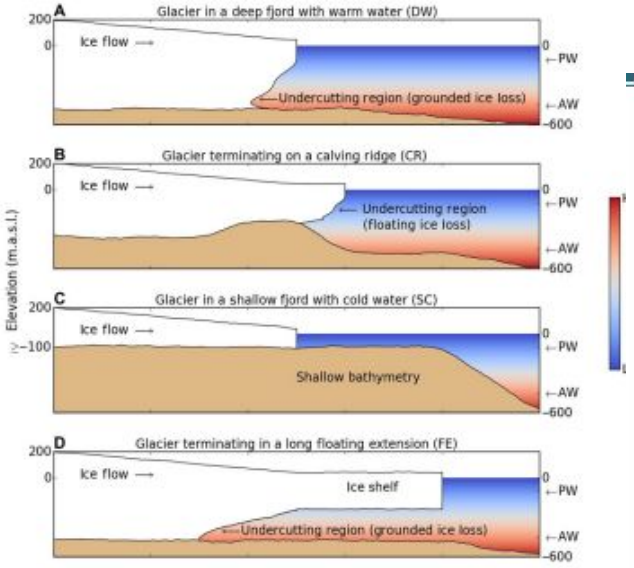
Learning Target: I can plan an investigation to find a problem with energy transfer in a geothermal heating system.

Success Criteria: I will…

- identify the components of the geothermal system.
- define the energy transfer processes in the system.
- plan steps to investigate potential problems.
- control variables and define system boundaries for the investigation.
- record observations and data to identify energy transfer issues.

- ❖ System and Systems Models
- ❖ Planning and Carrying out Investigations

What students figure out



Data from Inuit hunters and fishers and NAS scientists suggest that warming oceans contribute to glacial melt

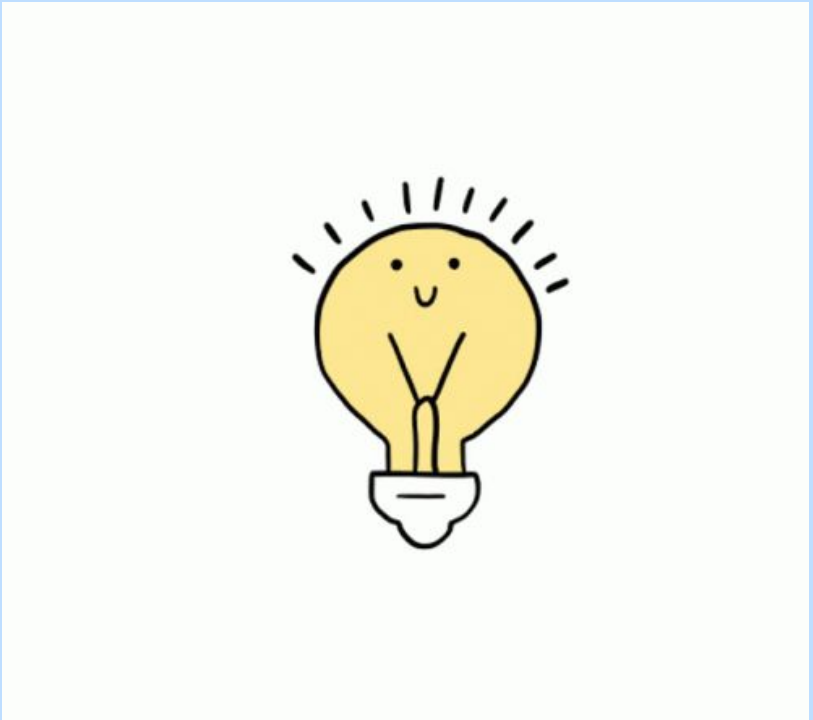


Samples of water of different temperatures and amounts of salt form layers when they first come into contact with one another.



We can build models that help us predict how different human actions will affect climate.

Thank you!



BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 10 f.

AGENDA REPORTING FORM

Agenda Topic: SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACA - Revised - Second Reading.

Summary of Issue: The Curriculum & Instruction Committee has reviewed the SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACA -Revised.

Background: _____

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Move that the Board of Education approve the SHS Earth Science - Unit 4, Astronomy - Guest Stars and the Big Bang ACA -Revised – as presented by the Curriculum & Instruction Committee.

Titles of Attachments:

1. Course Proposal

Christina L. Blatin
Signature of Staff Member Submitting Report

Peter Madaras
Signature of Superintendent of Schools

Unit Overview	
Unit Title:	ES: Astronomy - Guest Stars
Teacher:	Kelsey Duffy and Nicole Raccio
Grade Level/Course:	9 Earth Science
Length/Dates:	About 10 weeks
Unit Summary:	This unit is anchored in historical observations of stars that suddenly appeared and then disappeared within a short period of time. These phenomena prompt students to question why most stars seem constant while others change so dramatically. From this, students begin to wonder what causes stars to shine and what processes might lead to such rapid changes. Students organize their questions around key ideas of matter, energy, and forces, and decide to investigate the regions of the sky where these events were recorded using modern astronomical tools. In Learning Sequence 1 the students will explore the energy or electromagnetic radiation that is released from stars. In Learning Sequence 2 the students will analyze images and spectral data from the remnants of these events. They then develop a shared understanding of how the matter is changing in stars that results in this transfer of energy. The students will then explore the macro forces of stars that result in their stability vs instability. This unit can be expanded upon if students were to enroll in the 0.5 credit Astronomy courses. Building off these curricula, combined: Astronomy Skeleton Updated 2019 Astronomy Skeleton- Stars & the Big Bang OpenSciEd Unit P.6 Stars & the Big Bang OpenSciEd Unit P.5 Electromagnetic Radiation

Performance Expectations

- **HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.**

- **HS-PS4-4 Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.**
    - HS-PS4-3 Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.

- **HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation.**
- **HS-ESS1-3 Communicate scientific ideas about the way stars, over their life cycle, produce elements.**
- **HS-PS1-8 Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes ~~of fission~~, fusion, ~~and radioactive decay~~.**

Unit's Essential Question: Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away?

Lesson Level Essential Questions:

Learning Sequence 1: Energy from Stars

1. How does energy transfer away from a stable star vs a guest star?
2. How are the properties/characteristics of waves related?
3. What other types of light are coming from stars, and are they harmful?
4. What property of light makes it harmful?
5. Why do some types of EM radiation cause damage to living cells and not others?
6. Should we send astronauts into space?
7. What can be causing this energy transfer in guest and stable stars, how is it different between the two?

Learning Sequence 2: Matter and Forces within Stars

8. How does the matter in guest stars compare to stable stars?
9. What is happening with matter and energy in stable stars, like our Sun, and how does this help us understand guest stars?
10. How does running out of fuel cause a star to change?

Science and Engineering Practices (Skills)	Disciplinary Core Ideas (Knowledge)	Crosscutting Concepts (Enduring Understandings)
Using Mathematics and Computational Thinking Mathematical and computational thinking at the 9-12 level builds on K-8 and progresses to using algebraic thinking and	**PS4.A: Wave Properties** • The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the	**Cause and Effect** • Empirical evidence is required to differentiate between cause and correlation and make claims about

analysis; a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms; and computational tools for statistical analysis to analyze, represent and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.

- Use mathematical representations of phenomena or design solutions to describe and/or support claims and/or explanations.

Obtaining, Evaluating, and Communicating Information
Obtaining, evaluating, and communicating information in 9–12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs.

- Communicate scientific ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically).
- Evaluate the validity and reliability of multiple claims that appear in scientific and technical texts or media reports, verifying the data when possible.
- Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Developing and Using Models
Modeling in 9–12 builds on K–8 experiences

type of wave and the medium through which it is passing.

PS4.B: Electromagnetic Radiation

- When light or longer wavelength electromagnetic radiation is absorbed in matter, it is generally converted into thermal energy (heat). Shorter wavelength electromagnetic radiation (ultraviolet, X-rays, gamma rays) can ionize atoms and cause damage to living cells.
    - Electromagnetic radiation (e.g., radio, microwaves, light) can be modeled as a wave of changing electric and magnetic fields or as particles called photons. The wave model is useful for explaining many features of electromagnetic radiation, and the particle model explains other features

PS3.D: Energy in Chemical Processes and Everyday Life

- Nuclear fusion processes in the center of the sun release the energy that ultimately reaches Earth as radiation. (secondary)

ESS1.A: The Universe and Its Stars

- The star called the sun is changing and will burn out over a lifespan of approximately 10 billion years.
- The study of stars' light spectra and brightness is used to identify compositional elements of stars, their movements, and their distances from Earth.
- Other than the hydrogen and helium formed at the time of the Big Bang, nuclear fusion

specific causes and effects.

- Cause and effect relationships can be suggested and predicted for complex natural and human-designed systems by examining what is known about smaller scale mechanisms within the system.

Scale, Proportion, and Quantity

- The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.

Energy and Matter

- In nuclear processes, atoms are not conserved, but the total number of protons plus neutrons is conserved.

and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed world(s). ● Develop a model based on evidence to illustrate the relationships between systems or between components of a System.	within stars produces all atomic nuclei lighter than and including iron, and the process releases electromagnetic energy. Heavier elements are produced when certain massive stars achieve a supernova and explode **PS1.C: Nuclear Processes** ● Nuclear processes, including fusion, fission, and radioactive decays of unstable nuclei, involve release or absorption of energy. The total number of neutrons plus protons does not change in any nuclear process.	

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

C District Rubrics

Performance Assessment(s) and Evaluative Criteria:

1. LS1 Common Assessment: Part 1: Properties of Light Transfer Task: Students use properties of electromagnetic waves (wavelength, frequency, and speed) and patterns in data (optical density) to *effectively communicate* how light behaves in different materials and evaluate scientific claims about electromagnetic radiation. **HS-PS4-1; VoG: Communication**
   Success Criteria:
   - calculate the speed of a wave using wavelength and frequency with correct units.
   - compare different types of electromagnetic waves using wavelength and frequency.
   - explain how and why the speed of light changes when it enters different materials.
   - construct a scientific explanation (claim, evidence, reasoning) based on data
2. LS1 Common Assessment: Part 2: Evaluating 5G Safety Transfer Task: Students can demonstrate *critical thinking* by evaluating

arguments about the dangers of 5G radiation. HS-PS4-4, **VoG: Critical Thinking**

Success Criteria:

- identify the claim
- identify the evidence being used to support each of the author's claims
- Identify the author's reasoning or explanation of the evidence.
- consider the validity of the evidence provided by each claim in the social media post

3. LS2 Common Assessment: Algol Transfer Task: Students can *critically think* about evidence and models to explain how fusion changes matter in stars and how those changes can be used to determine a star's age. HS-ESS1-3, HS-PS1-8, **VoG: Critical Thinking**

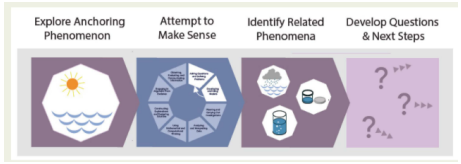
   Success Criteria:

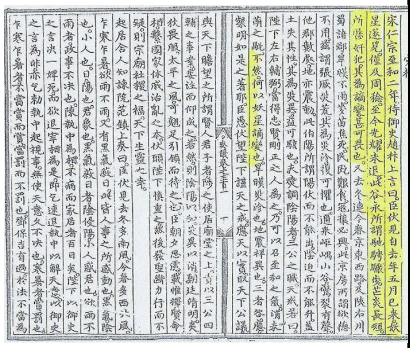
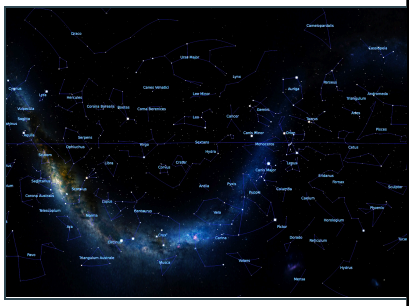
   - analyze data about star composition, fusion reactions, and energy production.
   - develop and use models to explain how elements are formed through nuclear fusion.
   - use evidence to make and support a claim about the relative ages of stars.

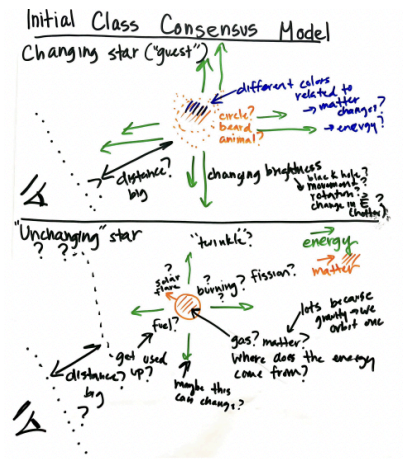
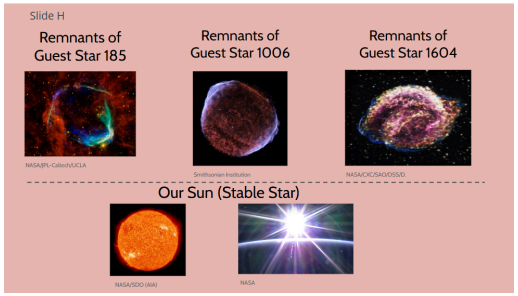
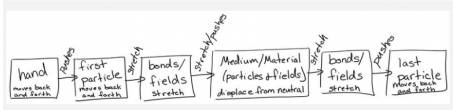
4. LS2 Common Assessment: Students can construct a model to *effectively communicate* how stable stars remain stable and how they can become unstable over their life cycles by describing the macro and microscales of stars and their lifespans. HS-ESS1-1, **VoG: Communication**

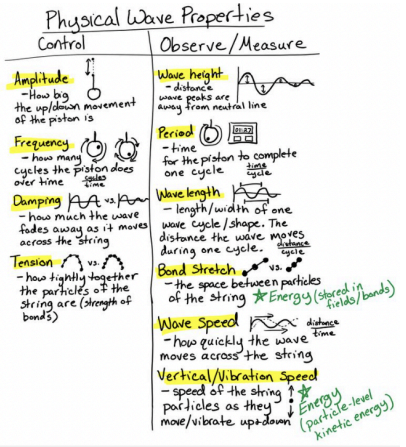
   Success Criteria:

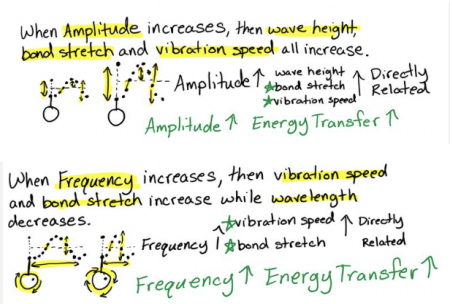
   - use graphics and text to update models of stellar systems based on evidence from multiple sources
   - explain how the mass of a star affects its stability and response to disruptions.

Target Question	Activity (estimated time 88 min for each)	Standard Objectives/Learning Target	Student will know and wonder
Learning Sequence 1: Energy from Stars **Raccio Class Notes - LS1: Stars: Electromagnetic Radiation (ES Astronomy)**			
Phenomena-Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away? **All Lesson Resources:** Lesson 1 - P.6 Stars & t…	**P.6 Lesson 1 Teacher Edition** **Engage in the Anchoring Phenomena Routine** 	**Learning Target:** I can develop a model to explain why most stars we see in the night sky appear stable while some "guest stars" change over time. **Success Criteria:** I will…	Students will examine historical evidence that some stars appear in the night sky even though we could not see a star there previously. The star fades away and seems to disappear. The students will map these events on a star map and look for patterns. Students will attempt to make sense by making initial models of changing and unchanging stars

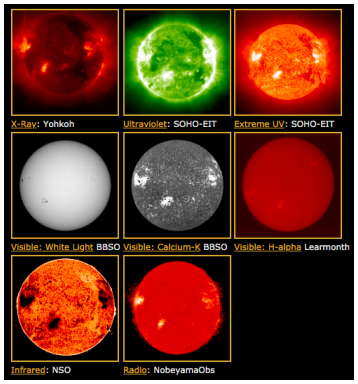
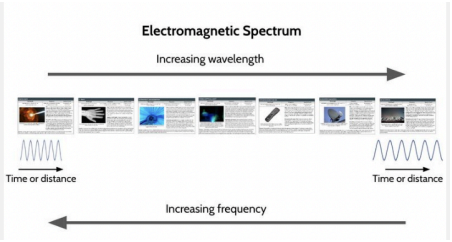
 	**Explore Anchoring Phenomena:** Introduce Guest Star 1054 slides A-S and Handout Historical Guest Stars - … **Attempting to Make Sense:** Students will create a notice and wonder chart in their notebook about the guest star. **Identify Related Phenomena:** 1. Students will remember what causes objects to release energy 2. Students will read about another guest stars **#1 Handout Historical Guest Star…** **#2 Handout Historical Guest Star…** **#3 Handout Historical Guest Star…** **#4 Handout Historical Guest Star…** **3.** Students will plot quest stars, including 1987A, on the sky chart and identify similarities and differences in historical guest stars. **Driving Questions and Next Steps** Students will develop a model of a change and unchange star and develop questions about their models as well as the historical information.	• Obtain information about historical guest stars to identify their location and appearance in the sky. • develop a model that shows why a star would change and would not change • use my model to explain why the stars we see at night appear stable over time, while historical accounts of guest stars describe them changing dramatically • ask scientific questions based on historical and current observations of stars	and use the models to ask questions about the historical observations of dramatic changes of stars to clarify our models, and seek additional information. **What students will figure out:** • A guest star is a star that appears and then seems to disappear a short time later. • Guest stars are distributed across the sky but seem to be concentrated along the plane of our galaxy (the Milky Way). ***What's next?*** *Since students asked questions about the energy released by the guest star they will examine how energy moves away from stars to provide us information about the guest star.*

			
Lesson 1-How does energy transfer away from a stable star vs a guest star? **All Lesson Resources:** Lesson 3 - P.5 Electrom…	**P.5 Lesson 3 Teacher Edition** **Engage:** What is given off by the remnants of the guest stars? How are these stars changing across different scales?  **Explore-**Remind students light is a form of energy. Ask students to transfer energy from between two people using a slinky/string. (Part I)	**Learning Target:** I can use and make a physical model of energy transfer in stars by comparing and contrasting different waves. **Success Criteria:** I will.. • physically model how energy is transferred from one object to answer • create an explanatory model showing energy is transferred into the system • use a computer simulation to define the properties of waves • construct an explanation for high	Students manually transfer energy as a wave with a slinky and use a computer simulation to identify energy transfers as a wave. Students will recall examples of physical waves. Students will develop a model for how physical waves transfer energy through solids using a computer simulation.  Students will define characteristics of waves and use a computer simulation to explain the difference between high and low energy waves in terms of the properties. **What students will figure out:**

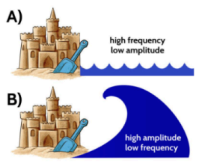
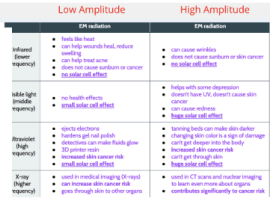
	How does energy travel? **Explain-**Discuss how energy can travel as a particle and wave and we are going to explore a wave first. **Explore/Explain-**Use the computer simulation to develop a model of a wave (Part 2) **Explore/Explain-**Use the computer simulation to explore high and low energy waves and define the properties of waves (Part 3) **Evaluate-**Construct an explanation for how the energy may be different traveling from a guest star and a stable star. (#7)	energy vs low energy waves	• When the first particle in the wave on a string is moved (as a force is applied to it, which transfers energy to it), it stretches the electric field (bond) between it and the next particle. • When a bond is stretched (or compressed), energy is transferred to the fields that produce the bond, and when it is unstretched (or uncompressed), that energy transfers out of the fields and back into the motion of the particles around it. • Waves have physical properties that can be defined as the following:  • Guest stars are high energy events compared to stable stars. **What is next?**

			Students will explore the relationship between wave properties and develop a mathematical model of the relationship between frequency, wave speed, and wavelength.
Lesson 2- How are the properties/characteristics of waves related? **All Lesson Resources:** Lesson 3 - P.5 Electrom…	**P.5 Lesson 3 Teacher Edition** **Engage:** Have students identify and define the identify variables they can test with the pHet simulation. **Explore:** Students will conduct their investigation (Part I). How are the properties/character… **Explain:** Students will share their results and then write claims based on the class results (Part II). **Elaborate:** Students will derive mathematical relationships and explore the speed in various mediums (Part III &IV). **Evaluate:** Lesson 3 Exit Ticket built in canvas called “Waves Check-in (Mini Transfer Task”)	**Learning Target:** I can plan and conduct an investigation using a pHet simulation to identify how certain wave properties affect energy transfer in waves. **Learning Target:** I can use mathematics to calculate the speed of light by using wavelength, frequency, and energy as variables to analyze the speed of light through different materials (cause and effect). **Success Criteria:** I will.. • identify independent variables as well as controls of your investigation • identify a quantitative and qualitative dependent variable • make a claim based on your investigation • identify mathematical relationships between	Students will plan and carry out an investigation to determine how one wave characteristic can affect wavelength and energy. Students will write evidence based claims. Students will learn that all forms of light travel through a vacuum travel at the same speed ($3x10^8$ m/s) due to the negative/indirect relationship between wavelength and frequency. Wavelength and frequency are multiplied to determine the speed of a wave. The students will revisit the DQB to identify and evaluate (and add to) all energy questions. **What students will figure out:**  • A larger amplitude means that

		wavelength, frequency, energy • calculate the speed of light waves using the relationship between frequency and wavelength. • analyze speed of light in various materials	the electric fields (bonds) between particles will be stretched farther in either direction in a given amount of time (period); this increase in vibration speed transfers more energy along the wave. • A larger frequency means that the bonds will be stretched back and forth more times per second; this increase in vibration speed transfers more energy along the wave. • The wavelength of a wave can be determined by the wave speed across the medium divided by its frequency or wave speed is determined by the wavelength times the frequency. • The wave model can explain how to calculate the speed of light. **What is next?** The students will go back to the driving question board to identify all the questions related to energy and realize that stars can give off energy that we can not see. The students will next explore all times of light energy coming from stars.
Lesson 3-What other types of light are coming from stars, and are they harmful?	**P.5 Lesson 9 Teacher Edition** **Engage:**	**Learning Target:** I can obtain and evaluate information about how EM radiation can be	The students will examine the remaining questions in the energy category of questions on the Driving

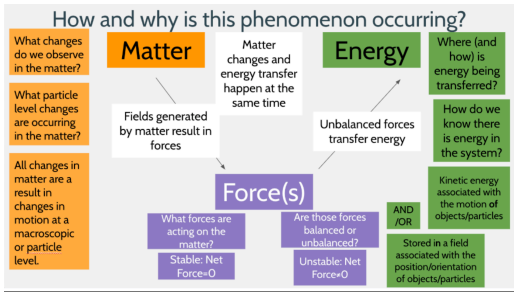
All Lesson Resources: Lesson 9 - P.5 Electrom…	What type of energy is given off by the sun? Is it dangerous? Hubble images Chandra - RCW 103  **Explore in EM Cards (Part I & II)** • Raccio Electromagnetic … **Explain (Part III)**-class discussion of selected question • EM Radiation Application… **Evaluate: (Part VI-Exite Ticket)** **Elaborate:** **Speed of Light EM Spectrum**	harmful based on its frequency, wavelength, and interactions with matter. **Success Criteria:** I will.. • organize electromagnetic (EM) radiation energy by its physical properties • write a definition of the EM spectrum • obtain and evaluate information about how the interactions with matter of EM radiation determines its use • ask questions that arise from examining a model of the electromagnetic spectrum related to the uses and material interactions of different types of electromagnetic radiation.	Question Board. They will then explore various types of EM radiation released by stars by constructing the EM spectrum based on their wavelength and frequency. The students will write an argument about the relationship between the frequency and wavelength of EM radiation and its interactions with matter, and how this relationship helps explain some of the uses of EM radiation. They will have a chance to add new questions to the DQB and decide to examine why some types of EM radiation can harm living organisms and others do not. **What students will figure out:** • EM radiation with high frequencies has short wavelengths; EM radiation with low frequencies has long wavelengths. • The EM radiation spectrum is arranged from high- to low-frequency EM waves.  • Different types of EM radiation have different interactions with matter, including heating it,

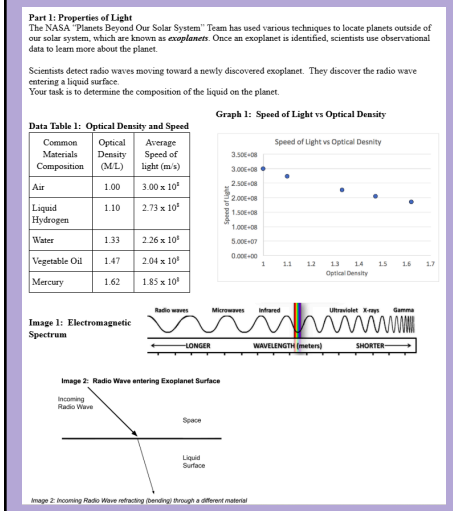
			ionizing it, or breaking apart its molecules. ● These interactions can be harnessed for various applications, such as medical imaging, telecommunications, and energy production. **What is next?** *The students will sort cards and identify the wave properties that better characterize harmful EM radiation. The students will use various data sources to identify the pattern of increased frequency and increased cancer risk.*
Lesson 4-What property of light makes it harmful? **All Lesson Resources:** Lesson 10 - P.5 Electro…	**P.5 Lesson 10 Teacher Edition (pgs 1-13)** **Engage:** Distribute the EM Radiation cards and have students identify the EM cards that cause the most harm. What do they have in common? **Explore:** Jigsaw reading to complete table/show video on slide with solar cell and demo solar cell in class Amplitude Frequency Evidence -… **Explain:** Which causes greater changes in matter (humans and/or solar cells): high amplitude or high frequency? What evidence do we have from class to support your answer?	**Learning Target:** I can obtain, evaluate, and communicate information about how high amplitude or low frequency electromagnetic radiation is more dangerous and how it affects various materials. **Success Criteria:** I will… ● read articles and categorize information based on low-amplitude vs high-amplitude for various frequencies ● collect data on how various frequencies and	The students will identify the wave properties that characterize harmful EM radiation. We use various data sources to identify the pattern of increased frequency and increased cancer risk. **What students will figure out:** ● Some radiation is cancer causing and some radiation is not. ● More high-frequency radiation puts you at greater risk of cancer, but how much the risk increases depends on the type of radiation and the total exposure time.

	Does this align with our wave model of light? **Evaluate:** Part III	amplitudes affect solar cells. • write a claim about what causes more harm to human beings: high-amplitude EM radiation or high-frequency EM radiation. • Identify the most important evidence to support my claim	**What is next?** *The students will analyze a wave model and a photon model of EM radiation and determine that the photon model better explains why high frequency radiation causes damage to human cells.*
Lesson 5-Why do some types of EM radiation cause damage to living cells and not others? **All Lesson Resources:** Lesson 10 - P.5 Electro…	**P.5 Lesson 10 Teacher Edition (pgs 14-22)** **Engage- Bell Work on handout or**   roup | Which wave would cause the most damage to the sand castle, A or B? | Which TWO types of EM radiation can cause damage to matter? **Explore/Explain:** Photon Model (navigate through Part's I-III and develop class consensus throughout) **Evaluate:** Part VI	**Learning Target:** I can obtain, evaluate, and communicate information to explain why some types of EM radiation can cause damage to living cells by understanding the scale, proportion, and quantity of different EM radiation waves. **Success Criteria:** I will… • define a photon(Part I) • Evaluate the merits of the wave model and photon model of EM radiation ((Part II) • define ionization and connect this to either	The students will use a water wave analogy to explain this pattern but find the wave model insufficient. The students will analyze a photon model and compare the model with our evidence. We determine that the photon model better explains this behavior of EM radiation. **What students will figure out:** • The photons of high-frequency EM radiation have enough energy to knock out electrons of atoms and molecules, turning them into ions with different chemical properties. • The photon model of EM radiation can better explain the interactions of

		the wave model or particle model of light (Part III) • Construct an explanation using valid and reliable evidence obtained from a variety of sources (Part VI)	high-frequency EM radiation and matter. • Some radiation is ionizing and some radiation is not. • Ionizing radiation can cause changes in the structure of the DNA molecule, potentially altering its function. • More high-frequency ionizing radiation puts you at greater risk of cancer, but how much the risk increases depends on the type of radiation and the total exposure time. • Ionizing radiation is released from both stable and unstable stars and this radiation can damage cells. **What is next?** *The students have learned that space contains ionizing radiation. They will next decide we should be sending humans into space.*
Lesson 6-Should we send astronauts into space?	**Engage:** Show video of recent space travel **Explore:** Read and identify pros and con(Morality in Space ACA '25-26 / Morality in Space (EL/red read)**)** **Explain:** As a class identify the BEST evidence via a class summary table	**Learning Target:** I can obtain, evaluate, and communicate information about if we should send astronauts to space and make a connection to electromagnetic radiation by understanding the cause and effect of the dangers of electromagnetic radiation.	*Students will learn about the guidance given to NASA by the Institute of Medicine to inform decision making regarding human space travel. Students will assess the risk-reward dynamic inherent to sending human beings into space to conduct scientific research, and will ultimately be asked to grapple with the ethics of the scenarios of the missions.*

	and/or discussion Morality in Space Evidence or Morality in Space group organize… **Evaluate:** CER emphasis on the wavelength, frequency and energy of light) OR Communication Activity for Moral…	Prompt: Should we send astronauts in space? **Success Criteria:** I will… • identify the most important benefit and drawback of sending astronauts into space. • write a clear claim and support my claim with the best evidence • explain how the evidence supports my claim using scientific vocabulary AND include a counter argument • Argue (written or verbal) if we should send astronauts in space including evidence to support your position	*Students will analyze relevant data sets in order to make practical and moral judgments on NASAs decisions to send humans into space.* *Students will construct an argument which promotes a moral stance in support of or against sending human beings into space for the sake of advancing scientific knowledge.* **What is next?** *The students will revisit the DQB and their initial model. Or they may take the unit's assessment.*
Lesson 7-What can be causing this energy transfer in guest and stable stars, how is it different between the two?	**Engage-** Show the classes initial model and solicit changes based on new knowledge **Explore/Explain**- Show the EMF triangle from the previous unit and ask students to summarize the relationship between matter-	**Learning Target:** I can revise my initial model of a guest star and a stable star to include the transfer of energy released. **Success Criteria:** I will… • Accurately represent the energy released	The students will revisit their initial models to ensure energy is accurately represented on their models. They will also be prompted to remember the Energy-Matter-Force triangle and develop questions about the forces that are causing the energy transfer and how the matter may be changing in the star as a result of this force. **What is next?**

	 **Evaluate:** Have students come up with questions about the driving force and matter within the stars 	from a stable and guest star. • Answer all the questions related to energy on the DQB • Ask questions about the force and matter that is causing this energy transfer.	The students will take an assessment on light. If this lesson is completed after the assessment, *remind students that guest stars are stars that seem to appear suddenly and then disappear in a relatively short time. These events happen within our galaxy and have occurred recently (1987). Students should wondered what we would see if we looked at the night sky with a telescope and pointed it in the area where these events occurred*
LS1 Common Assessment - Part 1: Properties of Light Transfer Task-HS-PS4-1; VoG: Communication **Properties of Light & 5G Assessment ACA 25-26** **Properties of Light & 5G Assessment ACA MOD 25-26**		**Learning Target:** I can use models such as diagrams and mathematical models to support scientific explanations about properties of electromagnetic waves (wavelength, frequency, and speed) and patterns in data (optical density) to *effectively communicate* how light behaves in different materials. **Success Criteria:** • calculate the speed of a wave using wavelength and frequency with correct units.	



Part 1: Properties of Light
The NASA "Planets Beyond Our Solar System" Team has used various techniques to locate planets outside of our solar system, which are known as ***exoplanets***. Once an exoplanet is identified, scientists use observational data to learn more about the planet.

Scientists detect radio waves moving toward a newly discovered exoplanet. They discover the radio wave entering a liquid surface.
Your task is to determine the composition of the liquid on the planet.

Data Table 1: Optical Density and Speed

Common Materials Composition	Optical Density (M/L)	Average Speed of light (m/s)
Air	1.00	3.00 x 10^8
Liquid Hydrogen	1.10	2.73 x 10^8
Water	1.33	2.26 x 10^8
Vegetable Oil	1.47	2.04 x 10^8
Mercury	1.62	1.85 x 10^8

Graph 1: Speed of Light vs Optical Density

Image 1: Electromagnetic Spectrum

Image 2: Radio Wave entering Exoplanet Surface

Image 2: Incoming Radio Wave refracting (bending) through a different material

- compare different types of electromagnetic waves using wavelength and frequency.
- explain how and why the speed of light changes when it enters different materials.
- construct a scientific explanation (claim, evidence, reasoning) based on data

LS1 Common Assessment - Part 2: Evaluating 5G Safety Transfer Task- HS-PS4-4, VoG: Critical Thinking

Part 2: Evaluating 5G Safety
You have probably heard the phrase "5G" thrown around a lot lately. It's in cell phone commercials and on the news. Many people are calling it a game-changer for wireless technology. A 5G network should be able to offer significantly faster data transmission speeds than 3G or 4G, and can accommodate much more traffic. This is possible, in part, because 5G networks use a portion of the electromagnetic (EM) radiation spectrum to transmit digital information that isn't currently being used by other wireless communication devices. Companies are racing to increase their 5G coverage nationwide. To support this transition, some companies are building as many as 1 5G tower per block!



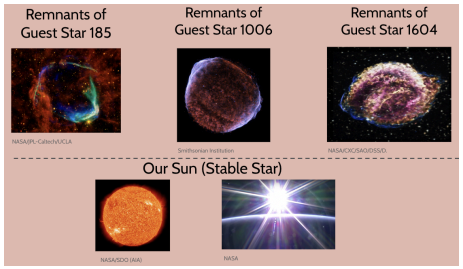
-Answer key and worksheets here:
Lesson 13 - P.5 Electromagnetic Radiation

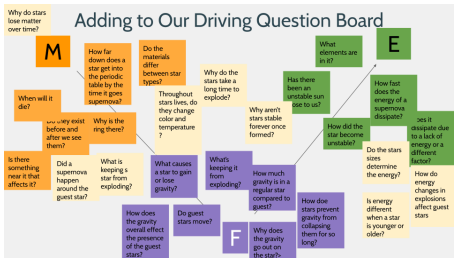
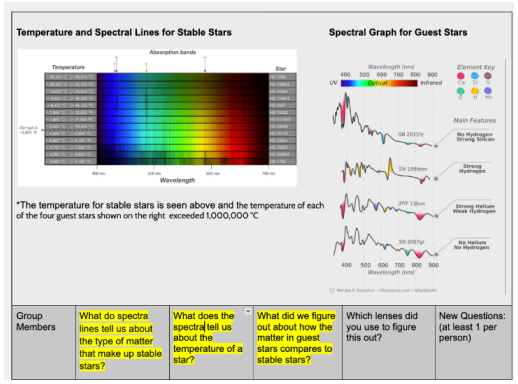
Learning Target: I can *critically think* by obtaining, evaluating, and communicating evidence and reasoning to support the validity of evidence provided on social media posts about the dangers of 5G radiation by recognizing the scale, proportion, and quantity of 5G waves.

Success Criteria:
- identify the claim
- identify the evidence being used to support each of the author's claims
- Identify the author's reasoning or explanation of the evidence.
- consider the validity of the evidence provided by each claim in the social media post

Learning Sequence 2: Matter and Forces within Stars
LS2: Stars: How do Stars Produce Energy and Matter? (Raccio)

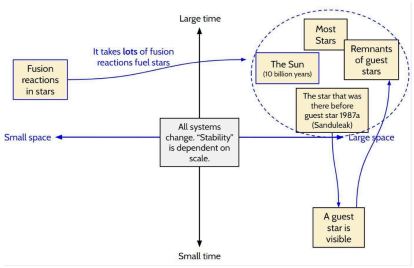
Lesson 8a: How does the matter in guest stars compare to stable stars? Day 1 **All Lesson Resources:**	**P.6 Lesson 2 Teacher Edition** **Engage**	**Learning Target:** I can use multiple models to describe differences in the composition and temperature scale of stable star stars versus guest	*Students will compare photos of the parts of the sky where some of these guest star events were observed and notice remnants of what looks like gas or dust.*

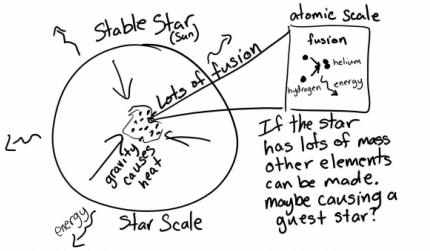
Lesson 2 - P.6 Stars & t…	Slides A-H Followed by Notice and Wonder chart  **Explore:** Spectra tube observations–students will observe the classroom light, several emission tubes as well the sun's light through the window. Highlight the connection between absorption and emission lines as well as element signatures. **Explain:** Spectral Line Analysis Reach class consensus on the difference between stable and guest starts. **Evaluate:** Answer to questions 6-8 following class discussion. **Elaborate:** Ask questions that arise from the spectra of a guest star and classify questions as either matter energy or forces.	stars by identifying patterns of absorption and emission spectra of different elements. **Success Criteria:** I will… • analyze and interpret light spectra from different stars to identify the composition • identify the patterns of absorption or emission lines that reveal what elements are present in a guest and stable stars. • describe how the color relates to a star's composition and temperature. • ask questions based on the spectra of a guest star to figure out why some stars stay stable for a long time while others change suddenly.	Students will analyze spectra of these regions to determine the chemical composition as well as its temperature. Students will then compare these to the spectra of stable stars. Students will then ask new questions focused on matter and add them to our Driving Question Board. Students will also classify their questions as matter or forces (or energy.) **What students will figure out:** • Stable stars are made of mostly hydrogen and helium, and their temperatures vary across a certain range. • Hydrogen and helium are the two lowest-mass elements. • Guest star remnants contain elements other than hydrogen and helium and in some cases no hydrogen and helium. • Temperatures of stable stars range from thousands to ten thousands °C or °F. Temperatures of guest star remnants are millions °C or °F. ***What's next?*** *We will consider how studying energy and matter in stable stars could help us answer our questions. We will be introduced to two new tools, the Planning for Obtaining Information*

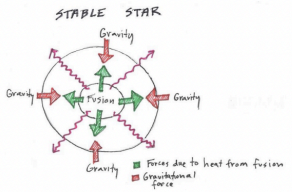
			*Tool and the Obtaining Information Tool, and we will use them to research answers to our questions. We will come to consensus and record our ideas in our Progress Trackers and Personal Glossaries. We will revisit the DQB.*
Lesson 8b: How does the matter in guest stars compare to stable stars? Day 2	**Engage**  **Explore:** Atomic Structure Interactive **Explain:** Have students use a periodic table to determine the number of subatomic particles (protons, neutrons and electrons) as well as draw Bohr Models of the atoms in the first three rows of the period table **Evaluate:** Bohr Model CheckIn **Elaborate:** Model revisions	**Learning Target:** I can revise my models of a guest star and a stable star to include the specific matter that makes them up using Bohr models to account for the atomic scale. **Success Criteria:** I will… • use an Atomic Structure Interactive model to identify the properties of subatomic particles. • create Bohr models of atoms in the first three rows of the period table • examine the spectra signature and model the matter of guest starts vs stable stars	*The students will reexamine the spectra of guest and stable stars. They will realize that stable stars, like our Sun, are very hot and mostly contain hydrogen and helium (small atomic nuclei). The remnant cloud of gas left over after a guest star event contains different types of matter than stable stars, larger atomic nuclei. The students will also learn how to model atoms using the periodic table to create Bohr models.* **What students will figure out:** • Stable stars are made of mostly hydrogen nuclei (1 proton, 0 neutrons) and helium (2 protons and 2 neutrons) • Guest star remnants contain larger atomic nuclei, they have more than 2 protons in the atomic nucleus ***What's next?***

			Students will consider how studying energy and matter in stable stars could help us answer our questions about forces. Students will be introduced to two new tools, the Planning for Obtaining Information Tool and the Obtaining Information Tool, and use them to research answers to our questions.
Lesson 9a: What is happening with matter (and energy) in stable stars, like our Sun, and how does this help us understand guest stars? **All Lesson Resources:** **Lesson 3 - P.6 Stars & t…**	**P.6 Lesson 3 Teacher Edition (pg 1-15)** **Engage:** Prepare two example websites ahead of time for students to assess credibility (one from Fake News site and another from a gov or university site, and one from wikipedia. Ask students the following: • What makes an online source *credible*? • Why might getting information from a *non*-credible source be a problem? **Explore:** Research one of the driving research questions using the obtaining information worksheet **Obtaining Information Tool - Racci** **Explain:** Consensus building discussion around: • Option 1: Where does the energy come from to power	**Learning Target:** I can obtain, evaluate, and communicate information about nuclear processes in stars and understand how their behavior is affected by these changes during their life stages. **Success Criteria:** I will… • research information about nuclear fusion processes in stars using multiple web sources. • identify if the source website was credible • construct and explanation about how stars like the Sun get their energy and change over time. • use periodic cards to identify patterns in the type of elements	Students will research energy and matter in stable stars, including the Sun, to help us answer our questions about guest stars. Students will consider the credibility of sources while tracking information regarding their research questions. Students will reach a class consensus around the answers to their research questions using information from websites as well as a card sort activity. **What students will figure out:** • A star is an object that is massive enough to cause Hydrogen nuclei to collide, igniting fusion • Energy from fusion causes stars to emit electromagnetic energy which travels to Earth (and throughout the Universe.) • Fusion results in new elements as multiple nuclei become one, i.e. Two

	stable stars like our Sun? • Option 2: How does the matter in stable stars change as energy transfers? **Explore:** Nuclear Fusion card sort [Fusion Card Sort] (to make copies if needed) Nuclear Fusion Cardsort (virtual) • Round 1: Use the provided periodic cards to create nuclear reactions that follow the Law of Conservation of Matter. • *Round 2:* Pile your elements together and organize them from lightest to heaviest. Hydrogen is the lightest and most abundant element in the universe. Starting with only the Hydrogen cards, create nuclear reactions that occur in a star. **Explain:** Reach class consensus for the following questions as a class: • What pattern do you see in the type of elements that are produced over time in a star? • What can you determine about the age of a star based on the fusion reactions that occur in it? **Evaluate:** **Fusion in Stars**	produced (fused) over time • create, analyze and draw fusion reactions to show and explain how atoms behave in stars to create light.	hydrogen atoms fuse to become one helium atom. Other elements can be made in more massive stars. • The total number of protons plus neutrons are conserved but atoms change. • Stars exist because there is a balance (or equilibrium) between gravity forces pushing inward and the outward pushing forces of the hot, fast moving particles at the center of the star (due to energy released by fusion). ***What's next?*** *Students will next gather information from an online simulation about how stars change over time. Students will communicate their findings in a gallery tour and reach a consensus about what* happens to the matter and energy of various mass stars over time including guest stars.

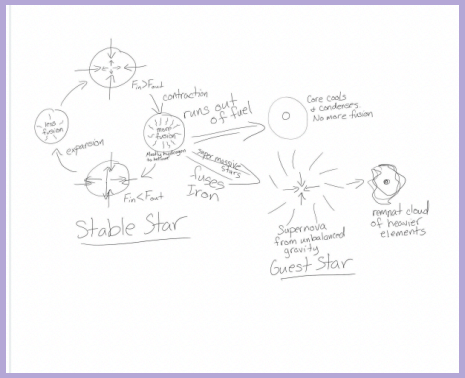
	Elaborate: Have students consider scale. Discuss the original ideas of stable stars, guest stars, remnants of guest stars as they relate to time and space. Once the existing phenomena have been adjusted for both scales, suggest that students add the new phenomena from this lesson to the chart, such as fusion and the Sun as an example of a stable star.  		
Lesson 9b: What is happening with matter and energy in stable stars, like our Sun, and how does this help us understand guest stars? **All Lesson Resources:** **Lesson 3 - P.6 Stars & t…**	**P.6 Lesson 3 Teacher Edition (pg 16-19+stellar evolution)** **Engage-***Use the ideas we obtained from the various sources to develop a model that explains what is happening with matter and energy within stars?*See page 16-19 for ideas on how to run this **Explore** **Star In A Box (ACA)** **Explain-Class Consensus**	**Learning Target:** I can use a computer simulation model to explain how stable stars remain stable and how they can become unstable over their life cycles by describing the nuclear and subatomic scale of atoms. **Success Criteria:** I will… • update my model of a stable star to specific include matter	*Students will create a model of a stable star, like our sun. They will include information about stars fusing hydrogen to release energy as electromagnetic radiation. This fusion creates new elements, where the protons and neutrons are conserved even though the atoms change. In order to start the fusion process gravity pulls the particles together, that is why stars are so massive.* Examples of models are below.

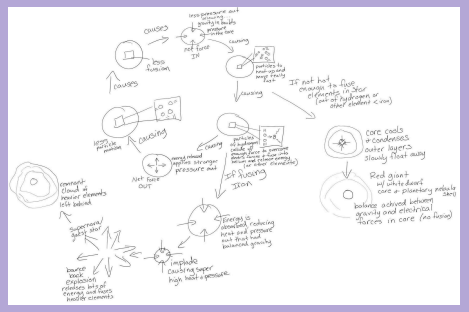
	• What factor/characteristic determines the stages a star goes through in its life cycle? • What pattern do you see between the mass of a star and the time the star is on the main sequence? **Evaluate-Answer to questions in Part III (25-29)**	• can use an online simulation to observe how different mass stars change with time • describe how the brightness, radius, and temperature of different mass stars changes over time. • model the forces on stars as they transfer between stages • construct an explanation of a stable star vs a guest star	 Next the students will use an online simulation to observe how stars' energy (brightness and temperature) as well as it's size change over time. **What students will figure out:** • What happens to a star when it dies depends on its mass. More massive stars run out of fuel faster because their gravity will cause the concentration of particles in the core to be higher, increasing fusion rates. • Stars eventually run out of hydrogen in their cores. When there is not enough concentration of particles to keep fusing heavier elements, the equilibrium is broken, and the star will die. • When a star like the Sun runs out of hydrogen to produce energy, the core will cool and condense. The Sun will become a red giant because

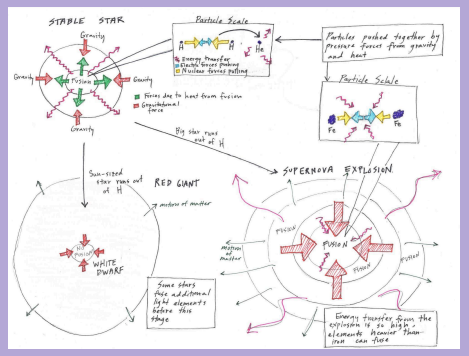
			of a multi-step process kicked off by this cooling and condensing and eventually fade away. ● Supernovae transfer a lot of energy into space. What ancient astronomers called “guest stars” are actually the light that results from this transfer of energy. ***What’s next?*** *Students will come to consensus on what causes stars to remain stable or become unstable and change and record those ideas in our Progress Trackers.*
Lesson 10: How does running out of fuel cause a star to change?	**Engage:** Observations of Orion Constellation (possible question ideas– Conclusions about Orion-Raccio) **Explore** ● **Stellar Evolution Pictures …** ● **Stellar Evolution Card So…** ● Stellar Evolution Readings (all stages)-(have ACA read only the ones that are not mentioned in star in box) **Explain** 1. Create and annotate a flow chart of a stars life cycle stages, see sample to the left and -Students conduct a gallery walk sharing their thinking (Use this simulation to validate their	**Learning Target:** I can obtain, evaluate, and communicate information to refine my explanations of how and why stars change temperature, composition and size over their lifespan by describing the macro and microscales of stars during their lifespans. **Success Criteria:** I will… ● use various sources (online simulation and readings) to create a stellar evolution flow chart	Students will develop a stellar evolution flow chart to include life cycle stages, fusion reactions as well as hydrostatic diagrams. An example of a hydrostatic diagram is seen  below: Students will come to consensus on what causes stars to remain stable or become unstable and change and record those ideas in our Progress Trackers.

	thinking: **WWTA | Life Cycle of Stars**) **Explore**- Raccio Why Do Stars Change? … **Explain-** Discuss the last slide and Develop a consensus model around How does running out of fuel cause a star to change? Annotate the flow chart of a star's life cycle stages to include hydrostatic diagrams and fusion information **Evaluate- (make copy for your students)** *https://docs.google.com/forms/d/1rFvIqjzL9cQuZ8HoLw3-zK8XcbS5fbhZd_KCUFfKKkA/edit* P.6 Lesson 5 Answer Key Electro…	• describe how fusion in a star changes over time (using specific reactions) • analyze hydrostatic models of stars to determine if they are stable or unstable. • explain how changes in matter and energy within a star cause it to stay stable or become unstable over time.	**What students will figure out:** • Massive stars can fuse heavier elements, up to iron for super-massive stars. • Stars will eventually run out of hydrogen in their cores. This causes the star to condense and if the star is massive enough, creates enough concentration of particles colliding together to fuse some other elements. • When a very massive star fuses iron in its core, the reaction will no longer release energy, and there will not be enough outward force to balance gravity, making the star unstable. The star collapses and bounces back in what is called a supernova. • Stable stars have a balance between gravity and fusion maintaining equilibrium gravity forces pushing inward and the outward pushing forces of the hot, fast-moving particles at the center of the star (due to fusion). • Once the star no longer has enough gravity to keep fusing heavier elements, the equilibrium is broken, and the star will die. • What happens to a star when

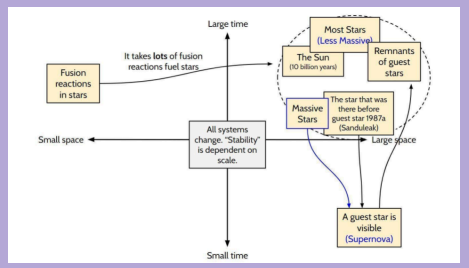
			it dies depends on its mass. More massive stars run out of fuel faster, and the particle concentration is higher in the core, so they can fuse heavier elements. ● When a star like the Sun runs out of hydrogen to produce energy, the core will cool and condense. The Sun will burn out/die and become a red giant because of a complicated process kicked off by this cooling and condensing and eventually fade away. ● Stars with way more mass than our Sun stars can fuse elements up to iron. The fusion of iron absorbs energy instead of releasing it. ***What's next?*** *We will create a Gotta-Have-It Checklist to explain what cause-effect relationships occur within stars. We will model the feedback loop that keeps stars stable and what happens when this loop is disrupted. We will update the Scale Chart and revisit the DQB.*
Lesson 11: Why do some stars seem unchanging, while	**Engage:** Revisit phenomena (slides/images for lesson 1)	**Learning Target:** I can construct a model to *effectively*	Students are ready to explain why a guest star appears and disappears.

others appear briefly, change dramatically, and fade away? HS-ESS1-1, **VoG: Communication ASSESSMENT** **All Lesson Resources this was ADAPTED FROM:** Lesson 5 - P.6 Stars & t…	**Explore: Part I of the following** **Stable vs Guest Star** **Explain:** *Do we have ideas represented on our checklist that help explain:* • *Matter changes* • *Energy transfer* • *The effect of forces being balanced or unbalanced* • *How stars remain stable* • *How stars change suddenly* Call on one pair per bullet and ask them to identify an idea on the checklist corresponding to that bullet. **Evaluation:** Create a series of models to tell the feedback loops story of what keeps some star systems stable and what happens that cause others to change dramatically. I **Student Examples**  	*communicate* how stable stars remain stable and how they can become unstable over their life cycles by describing the macro and microscales of stars and their lifespans. **Success Criteria:** I will… • use graphics and text to update models of stellar systems based on evidence from multiple sources. • explain how the mass of a star affects its stability and response to disruptions.	**What students will figure out:** • A guest star is a star that tries to fuse iron in its core, which is an endothermic reaction (it needs energy). This breaks the feedback loop that keeps stars stable. • The stable period for a star ranges from a few million years for the most massive to trillions of years for the least massive. • For a super-massive star, the star will collapse and bounce back out. releasing a lot of energy and fusing elements heavier than iron. When this happens, the star in the sky appears very bright. • After this event, the energy will move outward into space, and the star will fade away as the gas begins to disperse into a remnant cloud of heavier elements. ***What's next?*** *Unit Assessment*





-UPDATE THE SCALE CHART



-DQB REVISIT

INTERIM ASSESSMENT **(HS ESS1-3)**

- Earth Science Interim Assessments
- INTERIM ASSESSMENT (HS ESS1-3) (paper version)

Common Assessment: HS-ESS1-3, HS-PS1-8, **VoG: Critical Thinking**	LS2 Common Assessment: Algol Transfer Task: Students can *critically think* about evidence and models to explain how fusion changes matter in stars and how those changes can be used to determine a star's age.

Stellar Evolution Assess… Stellar Evolution Assess… Alternative Assessment Idea	**Learning Target:** I can use models as evidence to explain how fusion changes in matter in stars and how those changes can be used to determine the star's age by observing the macro and microscales of stars and their lifespan. **Success Criteria:** ● analyze data about star composition, fusion reactions, and energy production. ● develop and use models to explain how elements are formed through nuclear fusion. ● use evidence to make and support a claim about the relative ages of stars.

Astronomy

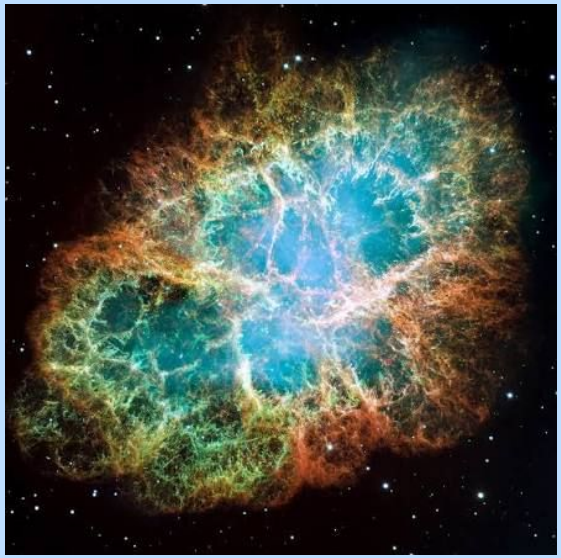


ACC & ACA Earth Science Course-Unit 4

Written by Nicole Raccio & Kelsey Duffy
Presentation Created by Nicole Raccio
October 21, 2026

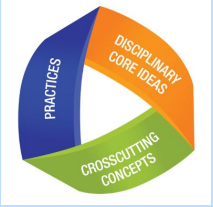
Unit 4: Astronomy

This unit is anchored in historical observations of stars that suddenly appeared and then disappeared within a short period of time. These phenomena prompt students to question why most stars seem constant while others change so dramatically. Students analyze images and spectral data from the remnants of these events. Students build a shared understanding of nuclear fusion and the life cycles of stars.

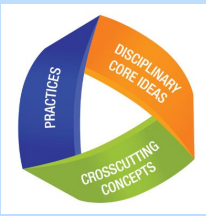


Standards Assessment

- HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy in the form of radiation.
- HS-ESS1-2 Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe. (ACC ONLY)
- HS-ESS1-3 Communicate scientific ideas about the way stars, over their life cycle, produce elements.
- HS-PS1-8 Develop models to illustrate the changes in the composition of the nucleus of the atom and the energy released during the processes ~~of fission~~, fusion, ~~and radioactive decay~~.
- HS-PS4-1 Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media
- HS-PS4-4 Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.
    - HS-PS4-5 Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.* (ACC ONLY)
    - HS-PS4-3 Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.



SEPs, DCIs, & CCCs



Science & Engineering Practices (SEP)

- Using Mathematics and Computational Thinking
- Obtaining, Evaluating, and Communicating Information
- Developing and Using Models
- Constructing Explanations and Designing Solutions (ACC ONLY)

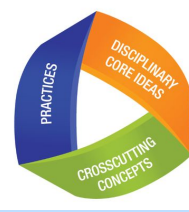
Disciplinary Core Ideas (DCI)

- PS4.A: Wave Properties
- PS4.B: Electromagnetic Radiation
- PS3.D: Energy in Chemical Processes and Everyday Life
- ESS1.A: The Universe and Its Stars
- PS1.C: Nuclear Processes

Crosscutting Concepts (CCC)

- Cause and Effect
- Scale, Proportion, and Quantity
- Energy and Matter

Learning Sequence 1: Energy from Stars



Lesson Level Question:

- Why do some stars seem unchanging, while others appear briefly, change dramatically, and fade away?
- How does energy transfer through a wave?
- What other types of EM radiation are there, and how do we use them?
- Does all electromagnetic radiation cause damage? Wave/Particle Duality
- Should we send astronauts into space?

Learning Objectives

- I can develop a model to explain why most stars we see in the night sky appear stable while some "guest stars" change over time.
- I can use and make a physical model of energy transfer in stars by comparing and contrasting different waves.
- I can plan and conduct an investigation using a pHet simulation to identify how certain wave properties affect energy transfer in waves.
- I can use mathematics to calculate the speed of light by using wavelength, frequency, and energy as variables to analyze the speed of light through different materials (cause and effect).
- I can obtain and evaluate information about how EM radiation can be harmful based on its frequency, wavelength, and interactions with matter.
- I can obtain, evaluate, and communicate information about how high amplitude or low frequency electromagnetic radiation is more dangerous and how it affects various materials.
- I can obtain, evaluate, and communicate information to explain why some types of EM radiation can cause damage to living cells by understanding the scale, proportion, and quantity of different EM radiation waves.
- I can obtain, evaluate, and communicate information about if we should send astronauts to space and make a connection to electromagnetic radiation by understanding the cause and effect of the dangers of electromagnetic radiation.
- I can revise my initial model of a guest star and a stable star to include the transfer of energy released.

Assessment:

Properties of Light and Evaluating 5G Safety

Part 1: Properties of Light
The NASA "Planets Beyond Our Solar System" Team has used various techniques to locate planets outside of our solar system, which are known as ***exoplanets***. Once an exoplanet is identified, scientists use observational data to learn more about the planet.

Scientists detect radio waves moving toward a newly discovered exoplanet. They discover the radio wave entering a liquid surface.
Your task is to determine the composition of the liquid on the planet.

Data Table 1: Optical Density and Speed

Common Materials Composition	Optical Density (M/L)	Average Speed of light (m/s)
Air	1.00	3.00×10^8
Liquid Hydrogen	1.10	2.73×10^8
Water	1.33	2.26×10^8
Vegetable Oil	1.47	2.04×10^8
Mercury	1.62	1.85×10^8

Graph 1: Speed of Light vs Optical Density

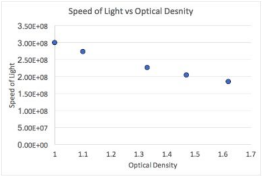


Image 1: Electromagnetic Spectrum

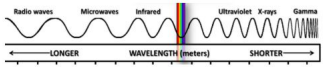


Image 2: Radio Wave entering Exoplanet Surface

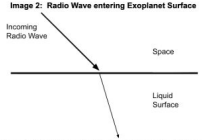


Image 2: Incoming Radio Wave refracting (bending) through a different material

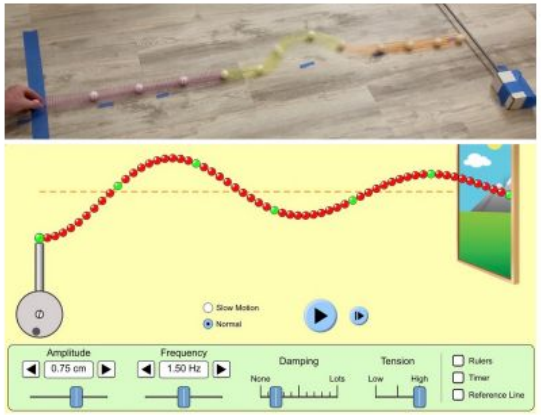
Part 2: Evaluating 5G Safety
You have probably heard the phrase "5G" thrown around a lot lately. It's in cell phone commercials and on the news. Many people are calling it a game-changer for wireless technology. A 5G network should be able to offer significantly faster data transmission speeds than 3G or 4G, and can accommodate much more traffic. This is possible, in part, because 5G networks use a portion of the electromagnetic (EM) radiation spectrum to transmit digital information that isn't currently being used by other wireless communication devices. Companies are racing to increase their 5G coverage nationwide. To support this transition, some companies are building as many as 1 5G tower per block!



Learning Target: I can use models such as diagrams and mathematical models to support scientific explanations about properties of electromagnetic waves (wavelength, frequency, and speed) and patterns in data (optical density) to *effectively communicate* how light behaves in different materials.

Learning Target: I can *critically think* by obtaining, evaluating, and communicating evidence and reasoning to support the validity of evidence provided on social media posts about the dangers of 5G radiation by recognizing the scale, proportion, and quantity of 5G waves.

What students figure out



Shaking the end of a slinky creates a wave pattern. A computer simulation of a wave on a string produces similar patterns.

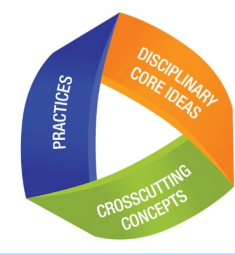


The electromagnetic spectrum includes various types of radiation with a wide range of frequencies, wavelengths, and uses, such as communication and medical imaging, but some types can also pose health risks.



EM radiation affects different materials in different ways.

Learning Sequence 2: Matter and Forces within Stars



Lesson Level Questions

- How does the matter in guest stars compare to stable stars?
- What is happening with matter and energy in stable stars, like our Sun, and how does this help us understand guest stars?
- How does running out of fuel cause a star to change?

Learning Targets

- I can use multiple models to describe differences in the composition and temperature scale of stable star stars versus guest stars by identifying patterns of absorption and emission spectra of different elements.
- I can revise my models of a guest star and a stable star to include the specific matter that makes them up using Bohr models to account for the atomic scale.
- I can obtain, evaluate, and communicate information about nuclear processes in stars and understand how their behavior is affected by these changes during their life stages.
- I can use a computer simulation model to explain how stable stars remain stable and how they can become unstable over their life cycles by describing the nuclear and subatomic scale of atoms.
- I can obtain, evaluate, and communicate information to refine my explanations of how and why stars change temperature, composition and size over their lifespan by describing the macro and microscales of stars during their lifespans.

Assessment:

Final Model and Algol A Transfer Task

The Life of Stars Assessment (mod)

Stars are the most widely recognized astronomical objects, and represent the most fundamental building blocks of galaxies. The study of the birth, life, and death of stars is central to the field of astronomy. Read, analyze and interpret the following information about the two stars called Algol A and Algol B to determine the history and future of these two stars.

Figure 1: Algol A (left) and Algol B (right) Currently

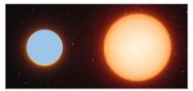


Table 1: Characteristics of Algol A and Algol B

Characteristic	Algol A	Algol B
Current Stage	Main Sequence	Giant
Current Color	Light Blue	Orange
Main Sequence Color	Light Blue	White
Initial Main Sequence Mass	10 x the sun	4 x the sun

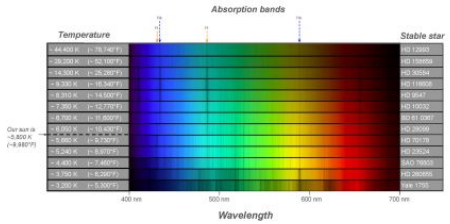
Table 2: The Relationship Between Temperature, Color, and Initial Mass of Stars

Temperature (K)	Color	Average Initial Mass of a Main Sequence Star (x Sun)	Time on the Main Sequence (million years)
More than 33,000	Dark Blue	More than 40	10 or less
10,000-30,000	Light Blue	10	25
7,500-10,000	White	4	200
5,200-7,500	Yellow	1	1200
3,700-5,200	Orange	0.5	60,000
Less than 3,700	Red	Less than 0.5	850,000 or more

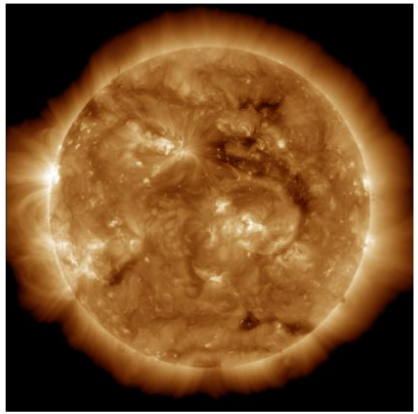
I can construct a model to *effectively communicate* how stable stars remain stable and how they can become unstable over their life cycles by describing the macro and micro scales of stars and their lifespans.

I can *critically think* about evidence and models to explain how fusion changes in matter in stars and how those changes can be used to determine the star's age by observing the macro and micro scales of stars and their lifespan.

What students figure out



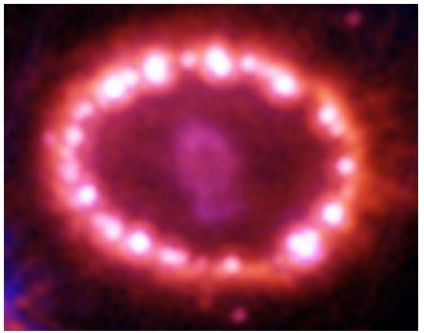
Semi-spherical shaped clouds of dust and gas can be seen in telescopic images from locations in the sky where guest stars were once observed.



Stars like the Sun are very hot and transfer energy out toward the Earth. The remnant cloud of gas left over after a guest star event also appears to transfer energy and contain different types of matter than stable stars.

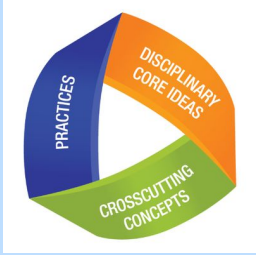


A model of the balance between the force of gravity and the force from fusion doesn't explain what will happen if there is not sufficient fuel for fusion.



A guest star appears and then disappears, but other stars shine with steady light. The cloud left over after a supernova is hotter than the original star and contains different matter.

Learning Sequence 3: Stars and the Big Bang [ACC ONLY]



Lesson Level Questions

- How has the matter in the Universe changed over time, and how do we know?

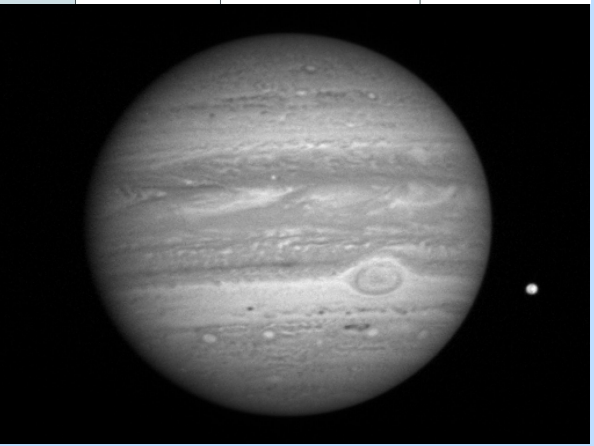
Learning Targets

- Read, evaluate, and communicate information about the Big Bang to explain that the theory is supported by empirical evidence of spectral patterns, including observations of distant galaxies receding from our own, of the measured composition of stars and non-stellar gases, and of maps of radiation permeating the Universe.

Assessment:

Jupiter Transfer Task

	Earth	Sun	Jupiter
Mass	1 x mass of Earth	333,000 x mass of Earth	318 x mass of Earth
Diameter	12,756 km	1,392,500 km	142,984 km
Volume	1 x Earth volume	1,300,000 x Earth volume	1,323 x Earth volume



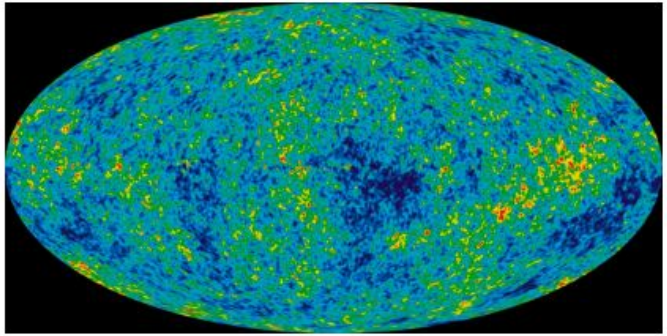
HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the Sun and the role of nuclear fusion in the Sun's core to release energy that eventually reaches Earth in the form of radiation. (SEP: 2.3; CCC: 3.1; DCI: ESS1.A.1, PS3.D.4)

Learning Target: I can develop models of the Jupiter and Sun systems to explain the source of the light we observe and how an object's scale affects interactions in its core.

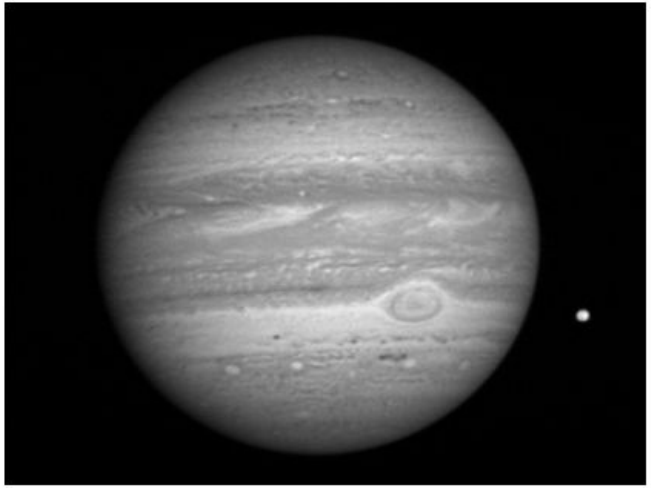
Success Criteria: I will…

- model where the light from Jupiter and the Sun originates.
- compare how differences in scale affect conditions and interactions (fusion) in Jupiter's and the Sun's cores.
- use evidence to explain how core interactions relate to the light each object emits.

What students figure out

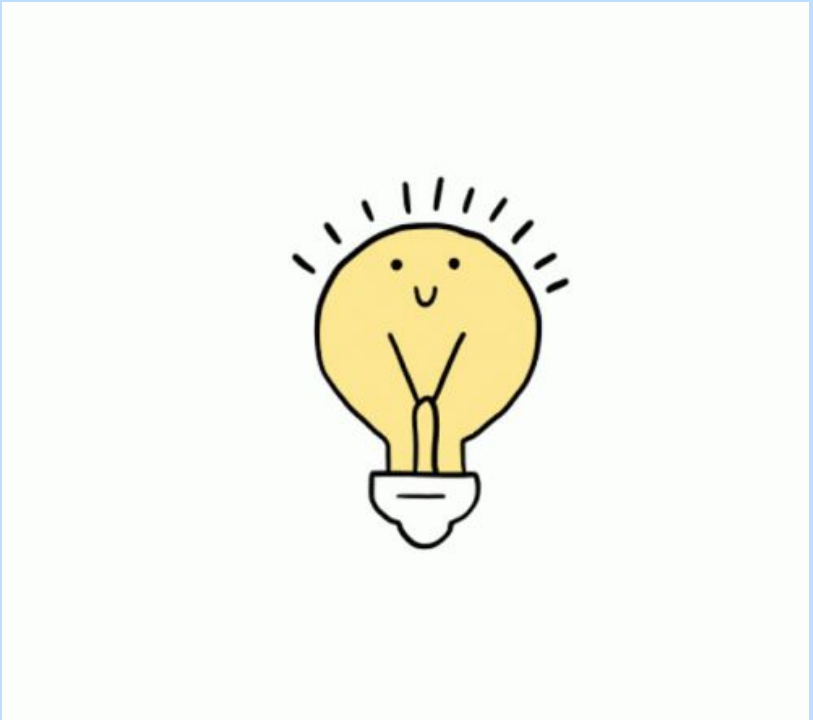


When we look at spectra of stars, galaxies, and empty space, we notice puzzling patterns that cannot yet be explained by our model.



We have so many questions about phenomena that we would like to explore in the future.

Thank you!



BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 10 g.

AGENDA REPORTING FORM

Agenda Topic: SHS History - Current Issues -Revised - Second Reading.

Summary of Issue: The Curriculum & Instruction Committee has reviewed the SHS History - Current Issues -Revised.

Background: _____

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

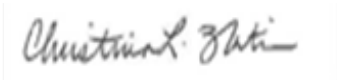
Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

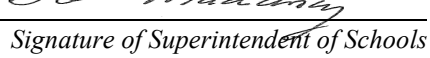
Recommendation or Comment: Move that the Board of Education approve the SHS History - Current Issues -Revised– as presented by the Curriculum & Instruction Committee.

Titles of Attachments:

1. Course Proposal



Signature of Staff Member Submitting Report



Signature of Superintendent of Schools

Southington Public Schools Curriculum
Current Issues

Unit 1 Overview	
Unit Title:	Your World, Your Voice: An Introduction to Current Issues, Global Citizenship, & Civic Responsibility
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	3 classes
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	This is the mandatory opening unit. It will ask students to consider what it means to be a global citizen and the importance of staying informed. Essentially, why study current issues? The semester's final three units are then chosen using arguments that students build in this unit's summative task.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Civ.1.9-12 Distinguish the powers and responsibilities of citizens, political parties, interest groups, and the media in a variety of governance systems.
- D2.Civ.5.9-12 Evaluate citizens' and institutions' effectiveness in addressing social and political problems at local, state, national, and/or global levels.
- D2.Civ.10.9-12 Analyze the impact and appropriate roles of citizens and institutions in effecting change in societal systems.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.7 Integrate quantitative/technical analysis with qualitative analysis of a text.
- WHST.9-10.1 Write arguments focused on discipline-specific content.
- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.1 Initiate and participate effectively in collaborative discussions.

Southington Public Schools Curriculum
Current Issues

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums while using the origin, authority, structure, context, and corroborative value to guide the selection of credible sources.
- Inq.3.b Organize and prioritize evidence directly and substantively from multiple sources in order to develop or strengthen claims (e.g., detect inconsistencies).
- Inq.4.a Construct arguments using precise and knowledgeable claims, with evidence from multiple sources, while acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, relevant examples, and pertinent details to contextualize evidence and arguments (e.g., chronology, causation, procedure).
- Inq.4.d Present arguments and explanations that feature evocative ideas and multiple perspectives about political issues and topics to reach a range of audiences and venues outside the classroom using print, oral, and digital technologies.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems/issues using a multidisciplinary lens.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Southington Public Schools Curriculum
Current Issues

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	1. Studying current issues builds the knowledge and skills people need to participate effectively in a democratic society. 2. As global citizens, our choices and circumstances are connected to people and events beyond our local community. 3. Citizens share a responsibility to stay informed and to engage — in ways that fit their own voice and capacity — with issues affecting the common good. 4. Convincing arguments require evidence, clear claims, and honest engagement with other opinions.

Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	1. Why does studying current issues matter to us as individuals and as a society? 2. What does it mean to be a global citizen? 3. How are local and global issues connected? 4. What is our responsibility to society when it comes to being informed and engaged citizens?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Current Issue • Global Citizenship • Civic Responsibility • Civic Engagement • Interdependence • Informed Citizenry • Common Good • Stakeholder • Advocacy • Perspective	• Identify and articulate why an issue matters at a personal, community, and global level. • Connect a local issue to its broader, global counterpart. • Evaluate different forms of civic engagement and when each might be appropriate. • Construct a claim-evidence-based argument and deliver it persuasively to an audience. • Acknowledge and respond to alternative viewpoints respectfully.

Stage 2: Evidence of Student Learning

Performance Tasks

Southington Public Schools Curriculum
Current Issues

Assessment Evidence
What will the student produce? Use the GRASPS model below to design your performance task.

Goal
- Convince your classmates and teacher that a specific topic from the Current Issues Topic Bank deserves to be one of the three student-selected units this semester.

Role
- You are a Citizen Advocate / Class Delegate.

Audience
- Your classmates and teacher, who will use student arguments to help decide the semester's three student-choice units.

Situation
- The course only has room for three student-selected units. Build an evidence-based case for why your chosen topic matters right now, connecting it to global citizenship and civic responsibility, while acknowledging that other topics in the bank are also worthy contenders.

Product/Performance/Purpose
- A one-page argument brief, plus an educational flyer to persuade classmates and teachers to agree with your choice.

Standards and Criteria for Success, including VoG Alignment
- (Critical Thinking) States a clear claim about why the topic deserves to be studied this semester.
- (Critical Thinking) Uses at least 2 credible pieces of evidence (a fact, statistic, or current event tied to the topic).
- (Content Mastery) Explicitly connects the topic to global citizenship and/or civic responsibility concepts from Lessons 1–2.
- (Critical Thinking) Acknowledges at least one competing topic from the bank and explains why theirs is still compelling.
- (Creativity) Creates a visually appealing and interesting flyer that draws attention to the importance of the topic.

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

- Canva Template: students should use Canva to design their flyers, specifically the “Educational Flyer” template
- Link to Document with Directions, Organizer, and Rubric

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

- Link to Document with Directions, Organizer, and Rubric

Southington Public Schools Curriculum
Current Issues

Comments Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.
• All freshmen in this course will also be taking Modern U.S. History. In that course, their first project/performance task is to write an “elevator pitch,” which is a CAST paragraph. This assignment can use the same template (for the one-page argument) and can build on what students will have been learning in the other course. You may want to check in with your students’ other teachers to see where they are and what students already know/do not know. • Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit is a single IDM inquiry arc that builds toward the semester ahead. Lesson 1 establishes why studying current issues matters; Lesson 2 widens the lens to global citizenship and interdependence; Lesson 3 turns to civic responsibility and culminates in the summative argument task. Distribute the Current Issues Topic Bank at the start of Lesson 1 so students can informally research candidate topics across the unit in preparation for their Lesson 3 argument and flyer. Because classes meet in 88-minute blocks, each lesson comfortably holds a staging/opening, a core inquiry task, and a closing synthesis — pacing suggestions are noted in the Key Activities column of the lesson table.

Inquiry Arc: Why Current Issues, Why Us (Lessons 1–3)

Compelling Question	*Which current issue deserves to shape our learning this semester, and why?*		
Standards & Practices	D2.Civ.1.9-12; D2.Civ.5.9-12: Evaluate citizens' and institutions' effectiveness in addressing social and political problems at local, state, national, and/or global levels.		
Staging the Question	“Headline Gallery Walk” (~20 min): students circulate past 8–10 anonymized current-event headlines spanning a range of topics (drawn from the Topic Bank), jotting initial reactions and questions on sticky notes, then share out in a whole-class discussion before the inquiry begins.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	Why does studying current issues matter to us as individuals and as a society?	What does it mean to be a global citizen, and how are local and global	What is our responsibility to society when it comes to being informed and engaged

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Current Issues

		issues connected?	citizens?
Formative Performance Task	(~45 min) Examine brief data on youth civic knowledge/engagement and a short reading on the value of an informed citizenry; write a “So What?” reflection paragraph on why current issues study matters personally and civically. Distribute the Topic Bank and preview the semester ahead.	(~50 min) Explore a global citizenship framework; complete a local-to-global connections graphic organizer linking a local issue to its global counterpart (e.g., a local food bank and global food security); reflection discussion.	(~35 min) Examine a spectrum of civic engagement options (voting, volunteering, advocacy, dialogue, service) Argument workshop: students finalize their one-page arguments using independent topic research gathered across the unit, then create visually appealing flyers.
Featured Sources	*Brief survey data on youth civic knowledge/engagement; short reading on the value of an informed citizenry; the Headline Gallery Walk set*	*Short global citizenship framework reading (e.g., adapted from UNESCO's Global Citizenship Education framework); brief case study connecting a local and global issue*	*Brief composite profiles of youth civic engagement across different forms of participation; the Current Issues Topic Bank*
Taking Informed Action (Optional)	**Understand:** Follow a credible news source covering your proposed topic for one week. **Assess:** Identify why the issue is — or isn't — getting the attention you think it deserves in the news you're following. **Act:** Share one current-event update related to your topic with the class to help kick off the semester's work, regardless of which topics are ultimately chosen.		

Lesson-by-Lesson Sequence

Note: Lesson 3 doubles as both the final content lesson and the summative task lesson; the argument workshop and flyers draw on independent research students conduct as homework across Lessons 1–2 using the Topic Bank distributed in Lesson 1. Be sure to hand out vocabulary list (without definitions) on day 1.

Southington Public Schools Curriculum
Current Issues

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Why Current Issues?	I will understand why studying current issues matters to both myself and society. I will understand that I have a responsibility to my community at all levels.	I can read and analyze headlines I can work with my classmates to come up with ideas I can combine multiple opinions into one idea I can write an argument	A. Headline Gallery Walk staging (~20 min) B. Analyze civic-knowledge data and an informed-citizenry reading in small groups (~35 min) C. Write a "So What?" reflection paragraph (~15 min) D. Topic Bank distributed and previewed (~15 min)	"So What?" reflection paragraph explaining why current issues study matters personally and civically.	Current issue, informed citizenry
2	Global Citizenship	I will describe global citizenship and identify how local and global issues are interconnected. I will identify ways to responsibly engage with societal issues.	I can explain what a global citizen is I can compare local topics with global ones I can participate in a mini-discussion I can acknowledge other opinions respectfully	A. Warm-up review (~10 min); explore a global citizenship framework and a local–global case study in small groups (~40 min) B. Complete a local-to-global connections graphic organizer (~25 min) C. Reflection discussion about how people can get involved/have a say. (~13 min).	Completed local-to-global connections graphic organizer plus a short reflection on one connection students found surprising.	Global citizenship, interdependence, common good, stakeholder, civic responsibility, civic engagement, advocacy
3	Responsibility to Society + Summative	I will construct an argument for why an issue	I can write an argument using evidence	A. Quick Vocabulary Quiz (~10 min) B. Argument workshop using independent topic	GRASPS argument brief and flyer scored with	Perspective

Southington Public Schools Curriculum
Current Issues

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		deserves our attention.	I can create a visually appealing flyer I can convince my teacher to choose my topic	research gathered across the unit (~50 min) C. Paper or digital gallery walk (~15 min) D. Taking Informed Action task assigned	unit rubric; Taking Informed Action follow-through.	

Southington Public Schools Curriculum
Current Issues

Unit 2 Overview	
Unit Title:	Decoding the Headlines: Media Literacy, Misinformation, & Bias
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	7 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	This unit examines the fundamentals of today's news and the dangers of fake news and media bias. Over the course of this unit, students will learn about what makes an event truly "newsworthy", the differences and dangers of misinformation and disinformation and how media bias can influence our views on the world and current events. Students will practice identifying the criteria of a news story, the tactics used to spread disinformation and how to spot media bias in the news. This unit is meant to support media literacy skills used across all disciplines and emphasize real life applications to students.

Stage 1: Desired Results

Grade Level/Subject Standard(s) List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address
College, Career, and Civic Life (C3) Framework for Social Studies State Standards: • D2.Civ.14.9-12 Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights. • D2.His.4.9-12 Analyze complex and interacting factors that influenced the perspectives of people during different eras and contexts. **Common Core State Standards:** • RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin. • RH.9-10.2 Determine the central ideas of a source and provide an accurate summary. • RH.9-10.4 Determine the meaning of domain-specific words and phrases. • RH.9-10.6 Analyze how an author's point of view or purpose shapes the content and style of a text. • RH.9-10.8 Assess the extent to which the reasoning and evidence in a text support the author's claims. • RH.9-10.9 Compare treatments of the same topic across multiple sources.

- WHST.9-10.1 Write arguments focused on discipline-specific content.
- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.1 Initiate and participate effectively in collaborative discussions.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.1.b Explain how supporting questions contribute to an inquiry and how new questions emerge when engaging varied-perspective sources.
- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.c Critique political arguments and explanations while acknowledging strengths and weaknesses given purpose and audience.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.
- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:

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Current Issues

Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:

Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal

Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	1. News is selected and shaped by human and algorithmic decisions about what counts as "newsworthy," and those decisions affect what the public knows and cares about. 2. Misinformation and disinformation both involve false or misleading content, but they differ in intent — and recognizing intent, where possible, changes how we should respond. 3. False and misleading content spreads through recognizable tactics (e.g., manipulated images, out-of-context claims, fabricated stories) that can be learned and detected. 4. All media contains some degree of bias, whether unintentional (word choice, story selection) or intentional (partisan framing); recognizing bias is different from dismissing a source entirely. 5. Becoming a savvy news consumer requires active habits — checking multiple sources, examining evidence, and questioning first reactions — not just good intentions.
Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: What Makes News, News?** 1. What criteria make an event "newsworthy"? 2. How has the definition of "news" changed in the digital and social media age? **Inquiry Arc 2: Misinformation & Disinformation Tactics** 1. Why does intent matter? 2. What are the common tactics used to create and spread false or misleading content? 3. Why do people believe and share false information, even when it's inaccurate? **Inquiry Arc 3: Media Bias** 1. What is bias, and how does it show up in media coverage? 2. How does partisan/political bias differ from other forms of bias, and how can we identify it? 3. How can we build habits to spot bias and seek out reliable, balanced information?

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What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Fake News • Misinformation • Disinformation • Satire/Parody • Misleading Content • Hoax/Fabricated Content • False Connections • Manipulated Material • Bias • Media Bias • Partisan (Political) Bias • Word Choice/Loaded Language • Omission • Selection of Sources	• Apply criteria to evaluate whether an event or claim is genuinely newsworthy. • Distinguish misinformation from disinformation and identify common tactics used to spread false content. • Identify specific indicators of media and partisan bias in a text. • Evaluate the credibility of a news source using multiple criteria. • Construct a practical, evidence-based media literacy resource for a real audience.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal • Create a practical resource that helps a specific audience tell the difference between reliable news, misinformation/disinformation, and biased coverage. **Role** • You are a team of News Literacy Coaches (3 people) working with a local news-literacy initiative. **Audience** • A middle-school social studies class. **Situation** • The initiative has noticed that people increasingly struggle to tell real news from fake, misleading, or heavily biased content, and has asked you to build a practical, evidence-based tool your audience can actually use. **Product/Performance/Purpose** • Choose one: a short tutorial video or a podcast episode. **Standards and Criteria for Success, including VoG Alignment** • (Content Mastery) Clearly explain at least 3 criteria of newsworthiness • (Critical Thinking) Accurately distinguish misinformation from disinformation, and explain at least 2 specific tactics used to spread false content • (Content Mastery) Identify at least 2 indicators of media/partisan bias

- (Content Mastery) Correctly apply at least 6 vocab terms from this unit
- (Critical Thinking) Use 2 credible examples or sources
- (Creativity & Collaboration) Work together to create a set of tips/guidelines for middle schoolers that they can actually use

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

- If students choose to create a video, they can use CapCut or Canva. They can also use the media recording function directly on Canvas.
- If they choose to create a podcast, they can use the media recording function directly on Canvas, or do a screen recording with just audio on their computers.
- Link to Directions, Rubric, and Graphic Organizers

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

- Link to Directions, Rubric, and Graphic Organizers

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across three IDM inquiry arcs. Arc 1 establishes what makes something “news” in the first place and how that definition has shifted in the digital age. Arc 2 turns to misinformation and disinformation — the difference intent makes, the common tactics used to spread false content, and why people believe and share it anyway. Arc 3 turns the lens on media bias itself, teaching students to spot specific bias indicators and distinguish media bias from partisan bias, before culminating in the GRASPS summative task. Because classes meet in 88-minute blocks, each lesson comfortably holds a staging/opening, a core inquiry task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table. Use illustrative, composite examples for misinformation/bias case studies rather than amplifying real viral hoaxes, and draw comparison examples from across the political spectrum so no single outlet or viewpoint is singled out.

Inquiry Arc 1: What Makes News, News?

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Compelling Question	What criteria determine whether something counts as real news?	
Standards & Practices	D2.Civ.14.9-12 — Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights.	
Staging the Question	“Front Page or Not?”: students sort a mix of headlines and story blurbs into “definitely news,” “maybe news,” and “not news,” then discuss what criteria they used. The goal is not to reach a final answer yet.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	What criteria make an event “newsworthy”?	How has the definition of “news” changed in the digital and social media age?
Formative Performance Task	Introduce classic newsworthiness criteria (timeliness, proximity, prominence, impact, human interest, conflict, novelty); apply them to a new set of headlines and complete a Newsworthiness Checklist.	Compare how people got news in the past (newspapers, network TV) vs. today (social media, algorithmic feeds, influencers); complete a “Then and Now” comparison chart.
Featured Sources	*Brief reading introducing standard news values/criteria; a mixed set of real and illustrative headlines for sorting*	*Brief reading introducing standard news values/criteria; a mixed set of real and illustrative headlines for sorting* *Brief reading on how social media algorithms curate and prioritize news content; a short history-of-news-media overview*

Inquiry Arc 2: Misinformation & Disinformation Tactics

Compelling Question	How do false and misleading information spread, and how can we recognize it?		
Standards & Practices	CCSS.ELA-LITERACY.RH.9-10.8 — Assess the extent to which the reasoning and evidence in a text support the author's claims.		
Staging the Question	“Can You Spot the Fake?”: students respond true/false to a few sample claims, then the answers are revealed and discussed to motivate the arc.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**

Supporting Questions	What is the difference between misinformation and disinformation, and why does intent matter?	What are the common tactics used to create and spread false or misleading content?	Why do people believe and share false information, even when it's inaccurate?
Formative Performance Task	Define misinformation vs. disinformation with intent as the key differentiator; classify short case scenarios and justify each classification with evidence of intent.	Station rotation / jigsaw covering five common tactics — satire/parody, misleading content, hoax/fabricated content, false connections, and manipulated material — using brief illustrative examples; complete a "Spot the Tactic" identification chart.	Explore why false content spreads (confirmation bias, emotional reactions, social proof, algorithmic amplification); analyze a short case study of content going viral; complete a personal media-habits reflection.
Featured Sources	*Brief reading distinguishing misinformation from disinformation, with illustrative examples*	*Brief, composite illustrative examples of each of the five tactics (not real viral hoaxes, to avoid amplifying them)*	*Brief reading on the psychology and mechanics of why misinformation spreads and goes viral*

Inquiry Arc 3: Media Bias - Shaping Our View of the World

Compelling Question	How does media bias shape the way we see the world, and what can we do about it?		
Standards & Practices	D2.His.4.9-12 — Analyze complex and interacting factors that influenced the perspectives of people during different eras and contexts. CCSS.ELA-LITERACY.WHST.9-10.1 — Write arguments focused on discipline-specific content.		
Staging the Question	Students compare two or three illustrative outlets' framing of the same event side by side and spot differences in headline, word choice, and emphasis before the inquiry begins.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**

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Supporting Questions	What is bias, and how does it show up in media coverage?	How does partisan/political bias differ from other forms of bias, and how can we identify it?	How can we build habits to spot bias and seek out reliable, balanced information?
Formative Performance Task	Introduce bias indicators — word choice/loaded language, omission, selection of sources — and distinguish general media bias from partisan/political bias; analyze sample excerpts using a "Bias Detective" checklist.	(Continued from Lesson 6, same supporting question): compare how the same story is covered by sources representing different points on the political spectrum, identifying specific bias indicators in each.	Build a personal "media diet" checklist (lateral reading, checking multiple sources, checking author/date/citations); apply it to the GRASPS resource.
Featured Sources	*Composite/illustrative excerpts demonstrating different bias indicators; a brief reading distinguishing media bias from partisan bias*	*Illustrative excerpts from sources representing different points on the political spectrum, covering the same event*	*Student-compiled notes and evidence from Lessons 1–6 for the GRASPS resource*
Taking Informed Action (Optional)	**Understand:** Track your own news consumption for 3–5 days — where you get news, which sources, and how often you check the origin or author. **Assess:** Evaluate your own media diet: Are your sources balanced? Do you fact-check before sharing? Identify one gap or habit you could improve. **Act:** Commit to and practice one specific new media-literacy habit (e.g., lateral reading, checking two sources before sharing, following a reputable fact-checking account) for the following week, and share your experience with the class.		

Lesson-by-Lesson Sequence

Note: Hand out vocabulary sheet (w/out definitions) to students on day 1

Common Sense Education's K–12 Digital Citizenship Curriculum lessons under "Information & Media Literacy"

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · Staging + SQ1	I will apply criteria to determine whether an event is genuinely newsworthy.	I can sort headlines into different categories I can explain new vocabulary words I can complete a Newsworthiness checklist	A. “Front Page or Not?” staging: sort a mix of headlines/story blurbs into definitely news / maybe news / not news, and discuss criteria used (~25 min) B. introduce classic newsworthiness criteria (timeliness, proximity, prominence, impact, human interest, conflict, novelty) (~20 min) C. apply criteria to a new headline set and complete a Newsworthiness Checklist (~30 min) D. exit ticket (~13 min) Lesson	Completed Newsworthiness Checklist applying at least 3 criteria to a new set of headlines.	Fake News
2	Arc 1 · SQ2	I will understand how the digital and social media age has changed how news is selected and delivered.	I can participate in a class discussion I can compare old media with new media	A. Warm-up review (~10 min) B. compare how people got news in the past vs. today, including how social media algorithms curate feeds (~40 min) C. complete a “Then and Now” comparison chart (~25 min) D. discussion debrief (~13 min). Lesson	Completed “Then and Now” comparison chart identifying at least two ways algorithmic curation changes what news people see.	Selection of Sources

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
3	Arc 2 · Staging + SQ1	I will distinguish misinformation from disinformation based on intent.	I can explain new vocabulary words I can decode the text I can apply my new learning to real-life scenarios	A. “Can You Spot the Fake?” staging quiz on a few sample claims, revealed and discussed (~15 min) B. introduce misinformation vs. disinformation, focused on the role of intent (~20 min) C. classify short case scenarios and justify each classification with evidence of intent (~40 min) D. exit ticket (~13 min). Lesson Optional: Newsfeed Defenders Game on iCivics	Completed classification chart distinguishing misinformation from disinformation with justifications.	Misinform-ation, Disinform-ation
4	Arc 2 · SQ2	I will identify common tactics used to create and spread false or misleading content.	I can collaborate with my classmates I can define 5 media tactics I can apply my knowledge in “Spot the Tactic”	A. Station rotation / jigsaw covering five tactics — satire/parody, misleading content, hoax/fabricated content, false connections, and manipulated material — using brief illustrative examples (~55 min) B. complete a “Spot the Tactic” identification chart matching new examples to the correct category	Completed “Spot the Tactic” identification chart correctly matching examples to categories.	Satire/ Parody, Misleading Content, Hoax/ Fabricated Content, False Connections, Manipulat-ed Material

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				(~20 min) C. whole-class debrief (~13 min). Lesson		
5	Arc 2 · SQ3 + Arc 2 Checkpoint	I will understand why people believe and share false information, even when it's inaccurate.	I can track the spread of viral content I can reflect on my own media use	A. Explore psychological/social reasons false content spreads (confirmation bias, emotional reactions, social proof, algorithmic amplification) (~35 min) B. analyze a short case study of content going viral (~25 min) C. personal media-habits reflection (~15 min) D. Arc 2 Checkpoint: written response to the Arc 2 compelling question (~13 min). Lesson	Virality case-study notes plus Arc 2 Checkpoint response.	Bias
6	Arc 3 · Staging + SQ1 & SQ2	I will identify specific indicators of media bias and distinguish it from partisan/political bias.	I can compare different articles on the same topic I can identify when an article is biased	A. Hook: compare 2–3 illustrative outlets' framing of the same event and spot differences (~15 min) B. Introduce bias indicators (word choice/loaded language, omission, selection of sources) and distinguish general	Completed Bias Detective checklist identifying specific bias indicators in sample excerpts.	Media Bias, Partisan (Political) Bias, Word Choice/ Loaded Language, Omission

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can explain the difference between partisan bias and generic bias	media bias from partisan bias (~30 min) C. Analyze sample excerpts using a "Bias Detective" checklist (~30 min) D. Debrief (~13 min). Lesson		
7	Arc 3 · SQ3 + Summative	I will build personal habits for evaluating news and construct a practical media-literacy resource for a real audience.	I can set goals for myself based on what I've learned in this unit I can create an informative video/podcast for middle schoolers I can explain vocab terms from this unit.	A. Build a personal "media diet" checklist (lateral reading, checking multiple sources, checking author/date/citations) (~20 min) B. GRASPS workshop time (~45 min) C. share/present resources (~23 min) D. remaining work may extend to a following period. E. Taking Informed Action task assigned. Performance Task Docs	GRASPS media-literacy resource scored with the unit rubric; Taking Informed Action follow-through.	Applied use of full vocabulary list

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Unit Overview	
Unit Title:	AI and Creativity: What Counts as Art?
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	5 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	This unit will ask students to consider how AI systems work and how they affect artists. Specifically, students will study copyright law regarding AI generated works and come to conclusions about what rules should guide AI in the future. This unit is designed to encourage students to explore topics also covered in Computer Science, Art, and Business Law classes.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Civ.14.9-12 (adapted) Analyze emerging issues surrounding intellectual property and creative rights in a digital society.
- D2.Eco.1.9-12 Analyze how incentives influence choices that may result in policies with a range of costs and benefits for different groups (e.g., creative industries).

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.
- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).
- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

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Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.

ONLY IF Taking Informed Action Task is Completed:

- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s):	• Definitions of “art” have always been contested and have shifted over time as new tools, techniques, and social movements challenged prior definitions.

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What are the big picture understandings that are transferable across contexts, places, and times?	• Generative AI tools produce creative output by learning patterns from vast datasets of existing human-made work, which raises new questions about originality, authorship, and consent. • Copyright and intellectual property law is still catching up to AI-generated content, creating real uncertainty for creators, companies, and courts. • The rise of AI creativity tools has economic and cultural consequences for working artists, and reasonable people disagree about how institutions and society should respond. • Deciding "what counts as art" is not only an aesthetic question — it is a values question with real stakes for creators, audiences, and institutions.

Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: Defining Art & Creativity in the Age of AI:** • What has historically counted as "art," and who decides? • How do AI systems actually generate creative works, and how does that compare to human creative processes? **Inquiry Arc 2: The Stakes of AI-Generated Creativity:** • Who owns AI-generated creative work, and what does current copyright law say? • How is AI creativity affecting working artists, authenticity, and the value we place on creative work? • What rules, norms, or policies should guide AI and creativity going forward?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Generative AI • Training Data • Prompt • Authorship • Intellectual property • Copyright • Originality • Authenticity • Creative economy • Artistic merit	• Analyze how criteria for judging art and creativity have shifted historically. • Explain, at a conceptual level, how generative AI tools produce creative output. • Interpret legal case summaries and apply them to new, unresolved questions. • Evaluate multiple stakeholder perspectives on a contested cultural and economic issue. • Construct an evidence-based written and oral argument that acknowledges counterclaims.

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Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence
What will the student produce? Use the GRASPS model below to design your performance task.

Goal
- Research and propose a clear, defensible policy for how a creative institution should treat AI-generated or AI-assisted work.

Role
- You are a Policy Advisor serving on a committee for a creative institution of your choice: an art museum/gallery, a school creative-writing or art contest, a music streaming platform, or a stock-image/art licensing marketplace.

Audience
- The institution's leadership board (teacher and/or guest evaluators role-playing board members).

Situation
- Your institution must decide whether, and how, to accept, label, exhibit, license, or award AI-generated or AI-assisted creative work. The board has asked you to research the debate and propose clear guidelines.

Product/Performance/Purpose
- A written policy recommendation (1–2 pages) and a visual (e.g., a one-page guidelines handout).

Standards and Criteria for Success, including VoG Alignment
- Clearly defines key terms (e.g., generative AI, authorship, originality) as used in the policy.
- Uses at least 4 pieces of credible, cited evidence representing more than one stakeholder perspective.
- Addresses ownership/copyright, authenticity, and economic considerations for artists.
- Evaluates trade-offs and directly addresses at least one counterargument.
- Guidelines are specific and feasible for the chosen institution to actually implement.

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

- Link to directions, rubric, and graphic organizers

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

- Link to directions, rubric, and graphic organizers

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Comments Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.
• Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across two IDM inquiry arcs. Arc 1 establishes what has historically counted as art and how generative AI actually works. Arc 2 turns to the stakes — ownership, authenticity, economic impact on artists, and the policies institutions should adopt — culminating in the GRASPS summative task. Because classes meet in 88-minute blocks, each lesson below comfortably holds a staging/opening, a core inquiry task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table.

Inquiry Arc 1: Defining Art & Creativity in the Age of AI (Lessons 1–2)

Compelling Question	When AI creates something, is it art?	
Standards & Practices	NCAS: Responding (adapted); D2.Civ.14.9-12 (adapted): Analyze emerging issues surrounding creative and intellectual property rights.	
Staging the Question	“Is This Art?” gallery walk (~20 min): students view brief descriptions/images of historically debated works — Duchamp's Fountain, an early photograph, a Rothko color-field painting, a Pollock drip painting, and an AI-generated image — and rate each on an “Is it art?” scale, then discuss what criteria they used.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	What has historically counted as “art,” and who decides?	How do AI systems actually generate creative works, and how does that compare to human creative processes?
Formative Performance Task	(~50 min) Read a short overview of how definitions of art have shifted historically (e.g., photography's early rejection, Duchamp's readymades, Abstract Expressionism's reception); complete a “criteria for art” concept-formation chart; write a short paragraph defining art in their	(~55 min) View/read a short, accessible explainer on how generative AI models are trained on large datasets and produce new output from a prompt; complete a compare/contrast chart of the human vs. AI creative process; small-group discussion.

	own words.	
Featured Sources	*Brief readings/overviews on historical art controversies (early photography, Duchamp's readymades, Abstract Expressionism); the gallery-walk image set*	*Short, accessible explainer on generative AI models (e.g., how diffusion models and large language models are trained and generate output)*

Inquiry Arc 2: The Stakes of AI-Generated Creativity (Lessons 3–5)

Compelling Question	When AI creates something, who gets to decide how to use it?		
Standards & Practices	D2.Eco.1.9-12: Analyze how incentives influence choices among firms and individuals in creative industries; D2.Civ.14.9-12 (adapted).		
Staging the Question	Quick-write (~10 min): “If you type a prompt into an AI tool and get an image back, who made it — you, the AI, the company that built it, or no one?” Share out to preview Arc 2.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	Who owns AI-generated creative work, and what does current copyright law say?	How is AI creativity affecting working artists, authenticity, and the value we place on creative work?	What rules, norms, or policies should guide AI and creativity going forward?
Formative Performance Task	(~55 min) Analyze brief, paraphrased case summaries of real copyright disputes and rulings involving AI-generated work (e.g., U.S. Copyright Office guidance, Getty Images v. Stability AI, Authors Guild v. OpenAI); complete a case-brief organizer.	(~55 min) Jigsaw of stakeholder perspectives — working artists/writers concerned about displacement and consent, AI companies emphasizing accessibility and new tools, and audiences/consumers on authenticity preferences; each group summarizes a perspective;	(~30 min) Compare existing institutional approaches (contests banning AI art, galleries embracing it, platforms' AI-labeling policies) using a brief comparison chart. (~45–50 min) GRASPS workshop: students choose an institution track and draft their policy recommendation, then deliver pitches to the “board.”

		whole-class synthesis discussion of trade-offs.	
Featured Sources	*Paraphrased summaries of U.S. Copyright Office guidance on AI-generated works; paraphrased case summaries of at least one image-related and one text-related lawsuit*	*Brief, paraphrased perspective summaries from artist advocacy groups, AI companies, and consumer/audience survey data on attitudes toward AI-generated art*	*Brief comparison of real institutional AI-art policies (contests, galleries, streaming/licensing platforms)*
Taking Informed Action (Optional)	**Understand:** Look up your own school's, or a local arts organization's, current stance (if any) on AI-generated creative work. **Assess:** Evaluate whether that stance matches what you learned in this unit, and identify one gap or open question it doesn't address. **Act:** Write a short letter or email sharing your recommendation with that school or organization, or create a one-page "guide" for classmates on how to think about AI and creativity responsibly.		

Lesson-by-Lesson Sequence

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · SQ1	I will analyze how the criteria for "what counts as art" have shifted historically.	I can visually analyze pictures I can work with a group to create a list I can define what art is.	A. "Is This Art?" gallery-walk staging (~20 min) B. read historical art-controversy overview and complete a criteria-for-art concept chart in small groups (~50 min) C. closing synthesis and short definition	"Criteria for art" concept chart plus a short paragraph defining art in the student's own words.	Artistic merit

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				paragraph (~18 min) Lesson		
2	Arc 1 · SQ2	I will explain how generative AI systems produce creative work and compare that process to human creativity.	I can explain what generative AI is I can compare and contrast human creations with AI creations	A. Warm-up review (~10 min) B. view/read a generative-AI explainer and complete a human-vs-AI compare/contrast chart in pairs (~55 min) C. small-group discussion and debrief (~23 min) Lesson	Completed compare/contrast chart identifying at least two similarities and two differences between human and AI creative processes.	Gener-ative AI, training data, prompt
3	Arc 2 · SQ3	I will explain current legal uncertainty around ownership of AI-generated creative work.	I can closely read a copyright dispute I can make decisions about copyright law	A. Quick-write staging (~10 min) B. analyze paraphrased case summaries of AI copyright disputes/rulings in small groups (~55 min) C. case-brief organizer and whole-class debrief (~23 min) Lesson	Completed case-brief organizer summarizing at least two disputes/rulings and their implications for ownership.	Authorship, intellect-ual property, copy-right, origin-ality
4	Arc 2 · SQ4	I will evaluate how AI creativity affects working artists, authenticity, and the value	I can define key class vocabulary I can work with my peers to	A. Review of key terms (~10 min) B. jigsaw of artist, AI-company, and audience perspectives, each group summarizing	Jigsaw perspective notes plus a short written reflection on which trade-off the student	Authenti-city, creative econo-my

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		of creative work.	become an expert on a topic I can listen to my peers and take notes on what they share	one viewpoint (~50 min) C. whole-class synthesis discussion of trade-offs (~28 min) Lesson	finds most significant.	
5	Arc 2 · SQ5 + Summative	I will evaluate existing institutional AI-art policies and construct a defensible policy recommendation addressing the compelling question.	I can compare different AI policies I can develop my own AI policy recommendation I can make a visual guideline I can follow through on what I've learned in this unit.	A. Compare real institutional AI-art policies using a brief chart (~30 min) B. GRASPS workshop time to draft policy recommendations by chosen institution track (~30 min) C. pitches to the "board" (~25–28 min) D. Taking Informed Action task assigned.	Institutional-policy comparison chart; GRASPS policy recommendation and pitch scored with unit rubric; Taking Informed Action follow-through.	Applied use of full vocabulary list

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Unit Overview	
Unit Title:	Bridging the Gap: Income Inequality & Poverty in the United States
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	6 Lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	This unit asks students to consider if the American Dream is still within reach for everyone. First, students will study poverty and income inequality in the United States. Then, students will examine the policies and plans that work to bridge the gap. This unit is designed to encourage students to explore topics also covered in Introduction to Sociology and AP Human Geography.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Eco.1.9-12 Analyze how incentives influence choices that may result in policies with a range of costs and benefits for different groups.
- D2.Eco.2.9-12 Use marginal benefit and marginal cost to construct an argument for or against a government policy.
- D2.Civ.10.9-12 Analyze the impact and appropriate roles of citizens and institutions in addressing local, state, and national problems.
- D2.His.16.9-12 (adapted) Integrate evidence from multiple relevant sources and interpretations into a reasoned argument.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.7 Integrate quantitative/technical analysis with qualitative analysis of a text.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.
- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).
- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.

- SL.9-10.1 Initiate and participate effectively in collaborative discussions.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.c Critique political arguments and explanations while acknowledging strengths and weaknesses given purpose and audience.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems using a multidisciplinary lens.

ONLY IF Taking Informed Action Task is Completed:

- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:

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Students effectively communicate and use interpersonal skills in a range of formal and informal contexts. **Citizenship Transdisciplinary Goal** Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Income inequality and poverty result from a complex mix of economic systems, policy choices, and historical/structural forces — not individual effort alone. • Statistics and data visualizations can be used, selectively framed, or misread to tell different stories about the same social issue. • Public policy involves trade-offs; no single anti-poverty solution satisfies every value, stakeholder, or budget. • Individuals and communities can influence public policy through informed, evidence-based civic action.

Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: Diagnosing the Gap** • What is income inequality, and how do we measure it? • What does poverty look like in the United States, and how is it measured? • What structural and individual factors shape poverty and social mobility? **Inquiry Arc 2: Responding to the Gap** • What policies has the U.S. used to address poverty and inequality, and how effective have they been? • What are the competing perspectives on how to reduce income inequality and poverty?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material

• Income inequality • Poverty threshold • Gini coefficient • Wealth gap • Social mobility • Living/minimum wage • Social safety net • Redistribution • Structural poverty • Food desert	• Interpret and analyze quantitative economic data (tables, charts, maps). • Evaluate the credibility and perspective of a source. • Distinguish correlation from causation in economic claims. • Construct an evidence-based written and oral argument that acknowledges counterclaims. • Engage in civil, evidence-based discourse about a contested policy issue.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence
What will the student produce? Use the GRASPS model below to design your performance task.

Goal
- Design and pitch a realistic, evidence-based policy proposal that reduces income inequality or poverty in a specific U.S. community.

Role
- You are a Junior Policy Analyst for a bipartisan Congressional Task Force on Economic Opportunity.

Audience
- The Task Force panel (teacher and/or guest evaluators role-playing legislators).

Situation
- The Task Force must recommend policies to narrow the income gap. You will select a community/population, diagnose root causes, evaluate at least two existing policies, and design a feasible proposal that acknowledges opposing views.

Product/Performance/Purpose
- A 5-minute panel presentation (slideshow) with a data visual, addressing the compelling question directly.

Standards and Criteria for Success, including VoG Alignment
- Uses at least 4 pieces of credible, cited evidence/data.
- Correctly applies at least 4 unit vocabulary terms.
- Diagnoses at least two root causes — one structural, one circumstantial.
- Evaluates trade-offs and directly addresses at least one counterargument.
- Proposal is specific and feasible (cost, implementation, stakeholders).
- Presentation is organized, cites sources, and uses a data visual accurately.

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

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- Link to directions, rubric, and graphic organizers
- Link to slideshow template

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

- Link to directions, rubric, and graphic organizers

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: The unit unfolds across two IDM inquiry arcs. Arc 1 helps students diagnose the causes and scope of income inequality and poverty; Arc 2 shifts to evaluating policy responses and competing perspectives, culminating in the GRASPS summative task and a Taking Informed Action extension.

Inquiry Arc 1: Diagnosing the Gap (Lessons 1–3)

Compelling Question	Is the American Dream still within reach for all?		
Standards & Practices	D2.Eco.1.9-12; D2.His.16.9-12 (adapted): Integrate evidence from multiple sources into a reasoned argument about a current issue.		
Staging the Question	“Where Do You Stand?” continuum activity: students physically position themselves along an agree–disagree line in response to statements such as “Anyone can become wealthy if they work hard enough,” then discuss in pairs before the inquiry begins.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	What is income inequality, and how do we measure it?	What does poverty look like in the U.S., and how is it measured?	What structural and individual factors shape poverty and social mobility?
Formative Performance Task	Analyze income-quintile and Gini-coefficient data; write a paragraph	Jigsaw the official poverty threshold vs. the	Compare a social-mobility data map with a short structural-barriers reading;

	explaining the trend and one claim it supports.	Supplemental Poverty Measure; complete a guided household-budget simulation and comparison paragraph.	complete a T-chart and a mini constructed response.
Featured Sources	*U.S. Census Bureau income-distribution tables; short explainer on the Gini coefficient*	*Census poverty-threshold data; excerpt from a household-budget simulation tool*	*Social-mobility data visualization; brief reading on structural barriers (e.g., school-funding disparities)*

Inquiry Arc 2: Responding to the Gap (Lessons 4–6)

Compelling Question	How can we make the American Dream possible for all?		
Standards & Practices	D2.Eco.2.9-12; D2.Civ.10.9-12: Analyze the impact and appropriate roles of citizens and institutions in addressing local, state, and national problems.		
Staging the Question	Quick-write: “If you had $1 to spend on one anti-poverty policy, where would you put it and why?” Share out to preview the range of policy options students will investigate.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	What policies has the U.S. used to address poverty and inequality, and how effective have they been?	What are the competing perspectives on how to reduce income inequality and poverty?	How can students construct and communicate an evidence-based response to the compelling question?
Formative Performance Task	Station rotation on minimum wage, EITC, SNAP, and progressive taxation; complete a goals/mechanism/evidence comparison chart.	Structured academic controversy using two brief opposing-viewpoint summaries; write a claim-evidence-reasoning paragraph.	Summative GRASPS policy brief and panel presentation (workshop, peer feedback, and delivery).
Featured Sources	*Nonpartisan policy-summary snapshots on minimum*	*Two brief, paraphrased opposing-viewpoint*	*Student-compiled evidence log from Lessons 1–5*

	wage, EITC, and SNAP effectiveness	*summaries (market-based vs. government-intervention approaches)*	
Taking Informed Action (Optional)	**Understand:** Research an actual anti-poverty policy proposal currently being debated in your state legislature or Congress. **Assess:** Evaluate who benefits and who bears the costs or trade-offs of that specific proposal. **Act:** Write a letter or email to a real or simulated elected official stating an evidence-based position, or design a public-awareness infographic for the school community.		

Lesson-by-Lesson Sequence

Note:

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · SQ1	I will explain what income inequality is and interpret data (e.g., the Gini coefficient) that measures it.	I can share my opinion with my classmates I can explain what a chart says	A. Staging: agree/disagree continuum on "anyone can get rich with hard work" B. analyze U.S. income-quintile charts and Gini trend line in small groups. Lesson	Written paragraph explaining what the data shows and one claim about the trend.	Income inequality, Gini coefficient, wealth gap
2	Arc 1 · SQ2	I will compare how poverty is defined and measured, and describe its lived reality.	I can work with a small group to understand topics I can share my ideas with the class I can balance a	A. Jigsaw: official poverty threshold vs. Supplemental Poverty Measure B. guided household-budget simulation. Lesson	Comparison paragraph on the two poverty measures plus budget-simulation reflection.	Poverty threshold, living wage, food desert

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			household budget			
3	Arc 1 · SQ3 (Arc 1 synthesis)	I will weigh structural and individual factors that shape poverty and social mobility.	I can explain some causes of poverty I can create a T-chart to represent my learning	A. Analyze a social-mobility data map alongside a short reading on structural barriers (e.g., school-funding disparities) B. complete a structural vs. individual T-chart C. revisit Lesson 1 continuum. Lesson	Mini constructed response: “To what extent is poverty a matter of individual choice vs. systemic factors?”	Social mobility, structural poverty
4	Arc 2 · SQ4	I will evaluate the goals and effectiveness of major U.S. anti-poverty policies.	I can explain major policies I can complete a graphic organizer I can compare and contrast different policies	A. Station rotation: minimum wage, EITC, SNAP, progressive taxation B. complete a goals/mechanism/evidence comparison chart. Lesson	Chart plus short written ranking of which policy seems most effective, with reasoning.	Social safety net, redistribu-tion
5	Arc 2 · SQ5	I will identify and evaluate competing perspectives on reducing inequality and poverty.	I can understand and explain different opinions I can share my opinion	A. Structured academic controversy / Socratic seminar using two brief opposing-viewpoint summaries (market-based vs.	Claim-evidence-reasoning paragraph identifying the more persuasive argument while	Review of all 10 terms

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			while being respectful to others	government-intervention approaches). Lesson	acknowledging the other side.	
6	Arcs 1+2 · Summative	I will construct and present an evidence-based policy proposal that addresses the compelling question.	I can demonstrate my learning on the vocab quiz I can develop a plan for a policy I can use feedback to make my work better	A. Vocabulary Quiz B. Workshop day: build GRASPS policy brief and presentation using evidence gathered in Lessons 1–5 C. structured peer feedback D. panel presentations E. Taking Informed Action task. Lesson	GRASPS policy brief + presentation scored with unit rubric; Taking Informed Action letter/infographic.	Applied use of full vocabulary list

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Unit Overview	
Unit Title:	Climate in Crisis: Understanding the Global Challenge of Climate Change
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	7 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	In this unit, students will study the effects of climate change on our world. They will consider who is responsible, and how we can work together to respond to it. This unit is designed to encourage students to explore topics also covered in AP Human Geography and Environmental Science classes.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Civ.3.9-12 Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order.
- D2.Civ.5.9-12 Evaluate citizens' and institutions' effectiveness in addressing social and political problems at the local, state, tribal, national, and/or international level.
- D2.Civ.13.9-12 Evaluate public policies in terms of intended and unintended outcomes, and related consequences.
- D2.Geo.5.9-12 Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions.
- D2.Geo.9.9-12 Evaluate the influence of long-term climate variability on human migration and settlement patterns, resource use, and land uses at local-to-global scales.
- D2.His.14.9-12 Analyze multiple and complex causes and effects of events in the past.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.7 Integrate quantitative/technical analysis with qualitative analysis of a text.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.

- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).
- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.a* Gather relevant information from multiple sources representing a wide range of views.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b* Construct explanations using sound reasoning, correct sequence, examples, and pertinent details, while acknowledging strengths and weaknesses given its purpose.
- Inq.4.c Critique political arguments and explanations while acknowledging strengths and weaknesses given purpose and audience.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems using a multidisciplinary lens.

ONLY IF Taking Informed Action Task is Completed:

- Inq.4.f* Apply a range of deliberative and democratic strategies and procedures to make decisions and take action in classroom, school, and out-of-school civic contexts.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

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Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Climate change is a global issue that crosses national borders and requires international cooperation, innovative solutions, and sustainable practices to mitigate its effects and adapt to its impacts. • Scientists use multiple lines of evidence, including proxy data, to understand both past and present climate change. • Climate change affects ecosystems and living things in ways that also affect the humans and communities who depend on them. • Responsibility for climate change and vulnerability to its effects are not evenly distributed across countries and communities. • International agreements and national policies have evolved over time, reflecting ongoing negotiation, disagreement, and incremental progress.
Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: Understanding Climate Change** • What is climate change, and how do scientists know it's happening? • How does climate change affect plants, animals, and the people who depend on them? **Inquiry Arc 2: Causes, Data, and Responsibility** • What does the data show about who is producing greenhouse gas emissions? • How does climate change affect different countries and communities differently, and who is best equipped to respond? **Inquiry Arc 3: Responding to Climate Change**

	• How have the U.S. and the international community responded to climate change over time? • What can individuals, communities, and nations do moving forward?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Climate change • Climate change deniers • Consensus • Continuity • Global warming • Proxy data • Greenhouse gases • Deforestation • Carbon dioxide • Industrialization • Fossil fuels • Net Zero • Adaptation • Mitigation • Renewable energy • Carbon Tax • Global North • Global South • Climate Justice • Kyoto Protocol • UN Framework Convention of Climate Change	• Analyze data, graphs, and proxy evidence to draw conclusions about climate change. • Use close reading strategies to interpret informational texts about climate science and policy. • Compare how climate change affects different places, communities, and living things. • Evaluate public policies and international agreements in terms of their intended and unintended consequences. • Construct evidence-based explanations and realistic recommendations, acknowledging strengths and weaknesses.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal • Create a scenario or plan that could realistically help limit global warming to well below 2°C — and ideally 1.5°C — by 2100. **Role** • You are a Climate Specialist, working alone or with a partner (offer this choice).

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Audience
- Policymakers and scientists.

Situation
- Climate change is one of the defining international issues of the era — it crosses national borders and has reshaped the priorities of the global community for decades. Protecting the planet and its inhabitants is urgent, but international progress can be slow and difficult.

Product/Performance/Purpose - choose Option A or B
- Option A (if the En-ROADS Climate Solutions Simulator is available): use En-ROADS to build a scenario, then complete either the short-form report (plan, political feasibility, winners/losers, surprises, hope, and personal action) or the long-form memo (detailed plan, a summary of how well it meets the 2°C/1.5°C goals, and a reflection).
- Option B (if En-ROADS is unavailable, or as a non-simulator alternative): using data and evidence gathered across the unit, design a climate action portfolio proposing specific mitigation and/or adaptation policies for a chosen country or region, addressing the same six questions — plan, feasibility, winners/losers, surprises/trade-offs, hope, and personal action.

Standards and Criteria for Success, including VoG Alignment
- Proposes specific mitigation and/or adaptation strategies with a rationale grounded in evidence from the unit.
- Considers political feasibility and identifies likely winners and losers of the plan.
- Addresses at least one surprising trade-off or unintended consequence.
- Reflects honestly on why this issue is difficult, while expressing realistic hope grounded in evidence.
- Identifies a specific, realistic personal action.
- (Option A only) Accurately reports the simulator's projected temperature outcome for the chosen scenario.

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.
- Link to directions, rubric, and organizers for both options

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?
- Link to directions, rubric, and organizers for both options

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.
- This unit is supported by and was designed using the CHOICES handbook - seek it out to make your teaching stronger!

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across three IDM inquiry arcs. Arc 1 builds foundational understanding of what climate change is and how it affects living things. Arc 2 turns to data, emissions, and the question of responsibility across countries and communities. Arc 3 examines how the U.S. and the international community have responded over time, and what individuals and nations can still do — culminating in "The Climate Future" GRASPS task. Because classes meet in 88-minute blocks, each lesson comfortably holds an opening, a core task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table. Content and pacing are kept intentionally accessible for a 9th–10th grade Current Issues course — this is an introduction to the topic, not an in-depth science or policy deep-dive.

Materials note: this unit is built around the Choices Program's "Climate Change and Questions of Justice" student book and teacher resource book (hard copy). The GRASPS offers a choice between the En-ROADS Climate Solutions Simulator, confirmed still active as of mid-2026 at climateinteractive.org, and a non-simulator, data-based alternative — use whichever fits your classroom's tech access on a given day.

Inquiry Arc 1: Understanding Climate Change (Lessons 1–2)

Compelling Question	What is climate change, and how does it affect the living things — including us — who depend on a stable climate?	
Standards & Practices	D2.Geo.9.9-12 — Evaluate the influence of long-term climate variability on human migration and settlement patterns, resource use, and land uses at local-to-global scales. | D2.His.14.9-12 — Analyze multiple and complex causes and effects of events in the past.	
Staging the Question	Play the "What Is Climate Change?" video with structured pause points: students write and revise their own definitions of climate change and global warming, check understanding of proxy data with concrete examples, briefly note how the information makes them feel, and predict what it might mean for their community, country, and the world.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	What is climate change, and how do scientists know it's happening?	How does climate change affect plants, animals, and the people who depend on them?

Formative Performance Task	Complete the staging video sequence; then analyze the "Freedom to Pollute" visual discovery image from the 2017 UN Climate Change Conference and discuss: is America doing enough?	Read Choices Student Book pp. 3–11 (Causes & Effects of Global Climate Change) with a graphic organizer; in small groups, read one of 7 Organism Profiles (pp. 10–23), complete the Effects of Climate Change graphic organizer (p. 24), and extend thinking to the impact on humans; discuss emerging themes.
Featured Sources	*"What Is Climate Change?" video lesson; "Is America Doing Enough?" visual discovery lesson*	*Choices Student Book pp. 3–24 and Teacher Resource Book graphic organizer/questions; "Postcards from Climate Change" video series*

Inquiry Arc 2: Causes, Data & Responsibility (Lessons 3–4)

Compelling Question	How do we determine who is most responsible for mitigating and adapting to the effects of climate change?	
Standards & Practices	D2.Geo.5.9-12 — Evaluate how political and economic decisions throughout time have influenced cultural and environmental characteristics of various places and regions. | D2.Civ.13.9-12 — Evaluate public policies in terms of intended and unintended outcomes, and related consequences.	
Staging the Question	Show a short CO_2 explainer video or explore the Carbon Map tool as an entry point into thinking about where emissions come from and who produces them.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	What does the data show about who is producing greenhouse gas emissions?	How does climate change affect different countries and communities differently, and who is best equipped to respond?
Formative Performance Task	Complete Choices Teacher Resource Book data-analysis handouts (pp. 43–46); discuss which graphs are most helpful for determining responsibility and why, their merits and drawbacks, and what additional data would help; use the EPA Household Carbon	Read Choices Student Book pp. 12–27 (Responses to Climate Change) with a graphic organizer; jigsaw case studies of California, China, Colombia, Freiburg (Germany), New Orleans, Haiti, Nigeria, and Bangladesh (pp. 29–55), considering local

	Footprint Calculator and compare results to class data.	priorities, responsibility for emissions, effects of greatest concern, and capacity to respond; build a short Google Slides teach-back for classmates.
Featured Sources	*CO_2 explainer video or the Carbon Map tool; Choices Teacher Resource Book handouts pp. 43–46; EPA Household Carbon Footprint Calculator*	*Choices Student Book pp. 12–55 and Teacher Resource Book graphic organizer p. 51*
Arc Summative Check	Homework discussion/paragraph: Based on the case studies, which countries seem most responsible for climate change, and which seem least responsible while having the fewest resources to respond? What evidence supports your answer?	

Inquiry Arc 3: Responding to Climate Change (Lessons 5–7)

Compelling Question	How can the world come together to address the issue of climate change?	
Standards & Practices	D2.Civ.3.9-12 — Analyze the impact of constitutions, laws, treaties, and international agreements on the maintenance of national and international order. | D2.Civ.5.9-12 — Evaluate citizens' and institutions' effectiveness in addressing social and political problems at the local, state, tribal, national, and/or international level.	
Staging the Question	Briefly revisit the Arc 2 homework responses on responsibility before turning to how the U.S. and the world have actually tried to respond over time.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	How have the U.S. and the international community responded to climate change over time?	What can individuals, communities, and nations do moving forward?
Formative Performance Task	Examine “U.S. Response: Continuity & Change” and “How Do Americans View Climate Change?”; compare the Kyoto Protocol (1997) to the Paris Agreement (2021);	Review a brief “State of the World” overview (UNEP Annual Report, UNFCCC analysis of national climate plans); watch and discuss a segment of Greta Thunberg's UN address; choose

	complete a Mythbusters matching activity using UN Mythbusters content and create a bumper-sticker task contrasting myth and fact.	and prepare for Option A or B of the GRASPS task.
Featured Sources	*"U.S. Response: Continuity & Change" and "How Do Americans View Climate Change?" lessons; Kyoto Protocol and Paris Agreement overviews; UN Mythbusters*	*UNEP Annual Report summary; UNFCCC analysis of national climate plans; Greta Thunberg's UN Climate Action Summit address*
Taking Informed Action (Optional)	**Understand:** Use the EPA Household Carbon Footprint Calculator or a similar tool to identify a specific local or personal contributor to greenhouse gas emissions (e.g., transportation, energy use, food, waste). **Assess:** Evaluate which changes would have the greatest realistic impact for your own household or community, and what trade-offs or barriers exist. **Act:** Choose one: commit to and track a specific personal change for two weeks, create an awareness resource for family or friends, or write to a local representative about a specific climate policy.	

Lesson-by-Lesson Sequence

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · Staging + SQ1	I will define climate change and explain how proxy data helps scientists understand it.	I can actively watch the video and write down central ideas while it plays I can define climate change and proxy data	A. Play "What Is Climate Change?" video with structured pause points: write and revise a definition of climate change/global warming; check understanding of paleoclimatologist and proxy data	Definitions of climate change/global warming plus visual discovery notes.	Climate Change, Global Warming, Proxy Data, Consen-sus

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can come up with predictions for our planet based on the video I can explain the steps America has taken to fight climate change	with examples (tree rings, ice cores); brief check-in on feelings after the data; write predictions for community/country/world (~55 min) B. “Is America Doing Enough?” visual discovery with a protest image from the 2017 UN Climate Change Conference (~33 min). Lesson 1: C…		
2	Arc 1 · SQ2	I will consider how climate change affects a variety of plants and animals in the US and the services they provide to people	I can explain the effects of climate change on living things I can work with a group to complete a graphic organizer and explain an organism profile I can write a well-written response on my own time	A. Close reading of Choices Student Book pp. 3–11 (Causes & Effects of Global Climate Change) with graphic organizer, assigned as homework or jigsaw (~30 min) B. small groups read one of 7 Organism Profiles (pp. 10–23), complete the Effects of Climate Change graphic organizer (p. 24), and extend thinking to human	Effects of Climate Change graphic organizer plus postcard-video written responses.	Green-house Gases, Deforest-ation, Carbon Dioxide (CO_2), Industrial-ization, Fossil Fuels

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				impact; share out (~45 min) C. discuss emerging themes (~13 min). HW: watch "Postcard from the Oregon Coast" plus one more from Postcards from Climate Change; write responses. Lesson 2: C…		
3	Arc 2 · Staging + SQ1	I will analyze data and graphs to consider who is responsible for greenhouse gas emissions. I will distinguish between mitigation and adaptation efforts to reduce harmful climate change effects.	I can actively watch a video to understand what Carbon Dioxide is I can use charts and graphs to come to conclusions I can find sources of emissions I can explain efforts used across the world to mitigate and adapt to the effects of climate change	A. Show a CO_2 explainer video or explore the Carbon Map tool (~15 min) B. complete Choices TRB handouts pp. 43–46 and discuss: which graphs are most helpful for determining responsibility, and why? What are the merits and drawbacks of each? What additional data would help? (~40 min) C. use the EPA Household Carbon Footprint Calculator, compare results to class data, and	Completed data-analysis handouts plus household carbon footprint comparison.	Net Zero, Adaptation, Mitigation, Renewable Energy, Carbon Tax

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				identify other emission sources (~33 min). Lesson 3: C…		
4	Arc 2 · SQ2	I will understand that areas of the world experience and respond to climate change differently	I can work with a group to study how countries respond to climate change I can create a resource that my classmates can use I can use case study evidence to reason about climate responsibility and capacity to respond.	A. Close reading of Choices Student Book pp. 12–27 (Responses to Climate Change) with graphic organizer p. 32 and study guide pp. 29–30, assigned as homework or jigsaw (~20 min) B. Case Studies Activity: jigsaw groups examine California, China, Colombia, Freiburg (Germany), New Orleans, Haiti, Nigeria, and Bangladesh (pp. 29–55), considering priorities, responsibility for emissions, effects of greatest concern, capacity to respond, and who is driving response efforts; complete graphic organizer p. 51 and build a short Google Slides	Case-study graphic organizer plus Google Slides teach-back; HW paragraph comparing responsibility vs. capacity to respond.	Global North, Global South, Climate Justice

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				teach-back for classmates (~68 min). Lesson 4: Cli…		
5	Arc 3 · Staging + SQ1	I will explain how the U.S. and the international community have responded to climate change over time.	I can explain how the US is responding to climate change I can differentiate between myth and fact when it comes to climate change I can compare and contrast different policies I can create a visual that reflects different perspectives	A. "U.S. Response: Continuity & Change" lesson and "How Do Americans View Climate Change?" (~30 min) B. compare the Kyoto Protocol (1997) and the Paris Agreement (2021) (~25 min) C. Mythbusters matching activity (UN Mythbusters titles/summaries) with a bumper-sticker task (~33 min). Lesson 5: C…	Kyoto vs. Paris comparison notes; Mythbusters bumper-sticker task.	Climate Change Deniers, Kyoto Protocol, UNFCCC
6	Arc 3 · SQ2	I will evaluate the current state of global climate action and identify realistic personal and collective responses.	I can explain real policies and climate plans I can explain how activism plays a role in climate response	A. "State of the World" overview: brief direct instruction on the UNEP Annual Report and UNFCCC's analysis of national climate plans ahead of COP28/COP-era	Speech-reflection notes; GRASPS option selected.	Review of full vocab-ulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can decide what project I will complete for my performance task	negotiations (~30 min) B. watch and discuss Greta Thunberg's UN speech (most important point, puzzling parts, a question to discuss, something interesting) (~25 min) C. preview the GRASPS task and choose Option A (En-ROADS) or Option B (~33 min). Lesson 6: C…		
7	Arc 3 · Summative (The Climate Future)	I will understand that addressing climate change is a multifaceted task.	I can demonstrate my knowledge of unit vocab I can break down charts, graphs, and maps to make them useful for my project	Vocabulary Quiz Day 1: review the task, pair students (or confirm solo), and build familiarity with En-ROADS or the Option B data set; homework: work on the plan. Day 2: up to ~30 min for questions; remaining time for Current Events of the Week or the next unit; product due.	"The Climate Future" report or memo scored with the unit rubric; Taking Informed Action follow-through.	Applied use of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				Taking Informed Action assigned. Lesson 7: C…		

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Unit Overview	
Unit Title:	Displaced Dreams: Immigrants and Refugees
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	6 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	In this unit, students will study the push and pull factors that cause people to leave home. They will consider what people lose, and what they are owed, when they're forced to leave home. Students will also examine the role of government when it comes to displacement. This unit is designed to encourage students to explore topics also covered in AP Human Geography, Introduction to Sociology, Asian Studies, International Relations, and Introduction to Human Rights classes.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Geo.7.9-12 Explain how changes in the physical environment can increase or diminish its capacity to support human activity.
- D2.His.16.9-12 Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past.
- D2.Civ.10.9-12 Analyze the impact and appropriate roles of citizens in monitoring and influencing state, local, and national governments.
- D2.Civ.14.9-12 Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.
- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).

- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.1 Initiate and participate effectively in collaborative discussions.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.1.b Explain how supporting questions contribute to an inquiry and how new questions emerge when engaging varied-perspective sources.
- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.c Critique political arguments and explanations while acknowledging strengths and weaknesses given purpose and audience.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems using a multidisciplinary lens.

ONLY IF Taking Informed Action Task is Completed:

- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

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Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Human migration is driven by a complex mix of economic, political, environmental, and social push and pull factors, and it has shaped societies throughout history. • The legal and social distinctions among migrant, immigrant, refugee, and asylum seeker carry real consequences for the rights and protections a person receives. • Nations continually balance humanitarian obligation, national security, economic interest, and cultural concern when they craft immigration and refugee policy. • Informed, engaged citizens can influence how their communities and government respond to displacement and immigration.

Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: Why do people leave everything behind?** • What is the difference between a migrant, an immigrant, a refugee, and an asylum seeker? • What forces push people from their homes and pull them toward new ones? **Inquiry Arc 2: What does a nation owe the people who arrive at its door?** • How has U.S. immigration and refugee policy changed over time? • What are the different perspectives on immigration and refugee policy today?

What will students <u>know...</u>	**What will students <u>be able to do…</u>**

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Factual information, vocabulary and basic concepts related to each standard/goal	Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Migrant • Immigrant • Refugee • Asylum Seeker • Internally Displaced Person (IDP) • Push Factor • Pull Factor • Xenophobia • Naturalization • Nonrefoulement	• Analyze primary and secondary sources for point of view, purpose, and reliability. • Construct evidence-based arguments that acknowledge competing viewpoints. • Distinguish fact, opinion, and reasoned claim in media coverage of a contested issue. • Collaborate to design a civically responsible, feasible policy recommendation. • Communicate findings clearly in written and oral/multimedia form.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal • Help your community make an informed decision about how to respond to a current local, state, or national immigration or refugee issue by presenting a well-researched, evidence-based recommendation. **Role** • You are a policy research team working for the Bridges Coalition, a nonpartisan civic organization hired to brief local decision-makers on a pressing displacement or immigration issue. **Audience** • A panel of local decision-makers (simulated in class as a school board, town council, or state representative's staff) and the wider school community attending a mock public forum. **Situation** • Your town or district has been asked to consider a real proposal — for example, whether to expand ESL and newcomer services in local schools, whether to support a refugee resettlement agency, or how to respond to a current immigration policy change — and the council has requested recommendations grounded in evidence rather than opinion alone. **Product/Performance/Purpose**

- A one- to two-page policy brief and a five- to seven-minute multimedia presentation (slides, infographic, or short video) delivered at a mock public forum.

Standards and Criteria for Success, including VoG Alignment

- Directly addresses the unit's compelling question.
- Uses specific claims supported by evidence from at least 4 featured sources across both inquiry arcs.
- Accurately defines and applies at least 4 unit vocabulary terms.
- Acknowledges at least one competing perspective.
- Ends with a concrete, feasible recommendation and a specific civic action.
- Maintains a respectful, evidence-based civic tone throughout.

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

- Link to directions, organizers, and rubric

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

- Link to directions, organizers, and rubric

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across two IDM inquiry arcs, each with its own compelling question feeding the unit's overarching compelling question. Arc 1 asks why people leave everything behind, grounding students in the legal distinctions among migrant, immigrant, refugee, and asylum seeker and the push/pull factors behind displacement. Arc 2 asks what a nation owes the people who arrive at its door, tracing the history of U.S. immigration and refugee policy and the range of stakeholder perspectives in today's debates — culminating in the GRASPS summative task. Because classes meet in 88-minute blocks, each lesson comfortably holds a staging/opening, a core inquiry task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table.

Inquiry Arc 1: Why Do People Leave Everything Behind?

Compelling	Why do people leave everything behind?

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Question		
Standards & Practices	D2.Geo.7.9-12 — Explain how changes in the physical environment can increase or diminish its capacity to support human activity. | D2.His.16.9-12 — Integrate evidence from multiple relevant historical sources and interpretations into a reasoned argument about the past.	
Staging the Question	Students view a set of unlabeled images and data points (a burned field, a packed suitcase, a UNHCR displacement statistic, a flooded coastline) and predict what connects them. Class discusses: what would have to be true for you to leave your home with only what you could carry?	
	Supporting Q1	**Supporting Q2**
Supporting Questions	What is the difference between a migrant, an immigrant, a refugee, and an asylum seeker?	What forces push people from their homes and pull them toward new ones?
Formative Performance Task	Sort five real-world case snippets into the correct legal category using a definitions chart, then justify one classification in a written paragraph citing the source language.	Analyze three short case studies (armed conflict, gang and economic violence, climate-driven displacement) and complete a push/pull factor T-chart; write a paragraph comparing the causes.
Featured Sources	*UNHCR glossary of key population terms; USCIS definitions page; one brief refugee profile (e.g., UNHCR or International Rescue Committee storytelling archive)*	*UNHCR Global Trends report excerpt/infographic; news coverage of Central American migration; case study of a climate-displaced community (e.g., Kiribati or coastal Bangladesh)*
Arc Summative Check	Constructed-response paragraph addressing the Arc 1 compelling question with evidence from at least two featured sources, submitted as an entry ticket to Lesson 4. (Lesson 3 builds toward this: students view/read a first-person narrative, complete an annotation or diary-entry writing workshop, and discuss how the narrative connects back to push/pull factors before writing the summative response for homework.)	

Inquiry Arc 2: What Does a Nation Owe the People Who Arrive at Its Door?

Compelling Question	What does a nation owe the people who arrive at its door?
Standards &	D2.Civ.10.9-12 — Analyze the impact and appropriate roles of citizens

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Practices	in monitoring and influencing government. | D2.Civ.14.9-12 — Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights.	
Staging the Question	Students read the closing lines of Emma Lazarus's 'The New Colossus' alongside a current headline about immigration or refugee policy and respond in writing: Does the promise on the Statue of Liberty still hold? Whole-class share-out surfaces initial positions to revisit at the unit's end.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	How has U.S. immigration and refugee policy changed over time?	What are the different perspectives on immigration and refugee policy today?
Formative Performance Task	Build an annotated timeline of key U.S. immigration laws and events (1882 Chinese Exclusion Act, 1924 National Origins Act, 1965 Immigration and Nationality Act, 1980 Refugee Act, 2012 DACA) and identify one turning point, explaining why it mattered.	Participate in a structured academic discussion in which each student represents a stakeholder (border-state official, resettlement caseworker, small-business owner, long-time resident, asylum seeker) built from real quotes; complete a perspectives matrix noting each stakeholder's interests and concerns.
Featured Sources	*Migration Policy Institute historical overview; brief excerpts/summaries of the listed legislation; a timeline infographic*	*Two to three op-eds representing differing viewpoints; Pew Research Center polling data on immigration attitudes; local news coverage of a resettlement debate*
Arc Summative Check	Perspectives matrix and civic-action options chart, checked for completeness and used as prewriting for the Unit Performance Task. (Lesson 6 builds toward this: students research realistic avenues for civic action using assigned sources, complete a civic-action options chart, and then launch the GRASPS performance task, forming teams and beginning work time that continues across subsequent class periods.)	
Taking Informed Action (Optional)	**Understand:** Research how displacement and immigration affect your own state or community — local resettlement numbers, the school's newcomer/ESL population, and recent local news coverage.	

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	Assess: Evaluate the effectiveness and gaps in current local and national responses: What resources exist? Where is there controversy or unmet need? **Act:** Choose an authentic action connected to the unit's findings: write a letter to a policymaker or newspaper editor, organize a school welcome or donation drive for newcomer families, create a public-awareness campaign, or present the team's recommendations at the mock public forum described in the GRASPS task.

Lesson-by-Lesson Sequence

Note: A supplemental lesson on Immigration & Customs Enforcement can be found here

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · Staging + SQ1	I will understand how displacement impacts lives.	I can explain charts and graphs about immigration I can define and distinguish among migrant, immigrant, refugee, and asylum seeker using precise legal and social criteria I can work with my peers to sort different cases	A. Staging activity with unlabeled images/data (~10 min) B. mini-lecture and vocabulary introduction, Terms 1–5 (~10 min) C. small-group sorting task with case snippets (~20 min) D. written justification and exit ticket (~10 min). Lesson	Case-snippet sorting task with a written justification for one classification, citing source language.	Migrant, Immigrant, Refugee, Asylum Seeker, IDP
2	Arc 1 · SQ2	I will compare the push and pull factors behind three different displaceme	I can collaborate with my small group to master a topic I can identify the push and pull factors in	A. Warm-up review of Lesson 1 vocabulary (~5 min) B. jigsaw reading of three case studies in expert groups (~20 min)	Push/pull factor T-chart plus a comparison paragraph analyzing the three case studies' causes.	Push Factor, Pull Factor

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		nt scenarios.	displacement scenarios I can listen to others and take notes on main ideas they share I can articulate the similarities and differences between 3 scenarios	C. T-chart construction and group share-out (~15 min) D. comparison paragraph, begun in class and finished for homework (~10 min). Lesson		
3	Arc 1 · SQ3 + Arc 1 Summative Check	I will synthesize immigrant stories to understand the impact of displacement.	I can listen to and identify central ideas of a personal immigrant experience I can use evidence from a personal narrative to construct an initial claim.	A. View/read first-person narrative (~15 min) B. annotation or diary-entry writing workshop (~20 min) C. whole-class discussion connecting narratives back to push/pull factors (~10 min) D. Arc 1 summative constructed response, completed for homework. Lesson	Arc 1 constructed-response paragraph addressing the compelling question with evidence from at least two featured sources, submitted as an entry ticket to Lesson 4.	Reinforcement of Arc 1 terms
4	Arc 2 · Staging + SQ1	I will understand how the nation's approach to immigratio	I can collaborate with my partner to order events I can understand	A. Staging activity: 'The New Colossus' vs. current headline, quick-write and share-out (~10 min)	Annotated timeline of key U.S. immigration laws and events, with a written	Xenophobia, Naturalization, Nonrefoulement

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		n has shifted over time.	perspectives from different historical contexts I can analyze why a specific immigration law mattered	B. vocabulary check, Terms 6–10 (~10 min) C. timeline-building activity in pairs using source excerpts (~20 min) D. whole-class synthesis discussion on turning points (~10 min). Lesson	explanation of one turning point's significance.	
5	Arc 2 · SQ2	I will understand and evaluate 5 stakeholder perspectives on immigration.	I can support an opinion with evidence I can listen for information and respond respectfully	A. Assign and review stakeholder role cards (~10 min) B. structured academic discussion / fishbowl (~25 min) C. perspectives matrix completed individually (~15 min). Lesson	Perspectives matrix noting each stakeholder's interests and concerns, scored with the structured academic discussion rubric.	Review of full vocabulary list
6	Arc 2 · SQ3 + Summative Task Launch	I will analyze real avenues for civic action on immigration and refugee issues.	I can demonstrate my knowledge of unit vocab I can work with my group to draft a policy I can generate realistic options for civic action on immigration	A. Vocabulary Quiz B. Civic-action research using assigned sources (~15 min) C. civic-action options chart (~10 min) D. GRASPS performance task introduced, teams formed, and work time begins (~25 min); remaining	Civic-action options chart and perspectives matrix, used as prewriting for the GRASPS policy brief and presentation.	Applied use of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				performance-task work and the mock public forum are scheduled across subsequent class periods. Lesson		

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Unit Overview	
Unit Title:	Hot Spots: Navigating Political Issues of the 21st Century
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	7 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	In this unit, students will study the major political conflicts going on at the time. They will examine areas where there have been ongoing issues, and consider why political conflicts elsewhere matter to those here in the United States. This unit is designed to encourage students to explore topics also covered in International Relations, AP Human Geography, World Religions, America at War, Asian Studies, and Human Rights classes.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Geo.7.9-12 (adapted) Explain how political, economic, cultural, and environmental factors contribute to conflict and cooperation among groups and countries.
- D2.Geo.4.9-12 Analyze relationships and interactions among human population, natural resources, and the physical environment.
- D2.Civ.12.9-12 (adapted) Analyze the role of international agreements, alliances, and organizations in maintaining or disrupting global order.
- D2.Eco.15.9-12 (adapted) Evaluate the local, national, and global economic impact of foreign events and policies.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.7 Integrate quantitative/technical analysis with qualitative analysis of a text.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.
- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).

- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems using a multidisciplinary lens.

ONLY IF Taking Informed Action Task is Completed:

- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:

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Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal

Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Geopolitical instability rarely has a single cause; it typically results from an interaction of political, economic, social, historical, and external factors. • Regions in conflict are connected to the rest of the world through trade, alliances, resources, and migration, so instability in one place can ripple outward. • Comparing multiple case studies side by side reveals recurring patterns as well as important differences in how and why instability develops. • Events in distant “hot spots” can affect everyday life in the United States — through prices, supply chains, security, and communities — even when the connection isn't obvious at first. • Understanding a conflict's causes and stakes is a necessary first step before forming a reasoned opinion about how the U.S. or international community should respond.
Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Unit Compelling Question:** • Why should we care about conflicts happening halfway around the world? **Inquiry Arc 1: Understanding Geopolitical (In)Stability:** • What causes geopolitical instability, and how can we recognize it? • How are today's hot spots connected to broader global systems? **Inquiry Arc 2: Case Studies in Global Hot Spots:** • What is driving instability in Russia/Ukraine and China's regional tensions, and what are the ripple effects? • What is driving instability in the Middle East and Venezuela, and what are the ripple effects? • What is driving instability in Africa's current hot spots, and what patterns recur across all the regions studied? **Inquiry Arc 3: Why it Matters to US:** • How do events in global hot spots affect communities here at home?

	• What should the U.S. or international community do in response to a specific hot spot, and how do we communicate that recommendation effectively?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Geopolitical instability • Sovereignty • Sanctions • Proxy Conflict • Authoritarianism • Displacement • Sphere of influence • Coup d'etat • Global supply chain • Diaspora	• Apply a consistent analytical framework to explain the causes of instability in a specific region. • Compare multiple case studies to identify recurring patterns and key differences. • Trace a concrete connection between a global event and a local or U.S. impact. • Evaluate the credibility and balance of sources covering a contested international issue. • Construct and deliver an evidence-based briefing that includes a specific, feasible recommendation.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal • Prepare a briefing that explains a specific global hot spot, analyzes why it's unstable, and recommends how the U.S. should respond — including why Americans should care. **Role** • You are a Regional Analyst / Briefing Officer for the U.S. National Security Council. **Audience** • A panel representing NSC policymakers (teacher and/or guest evaluators). **Situation** • The NSC needs an up-to-date briefing on one hot spot (chosen from Russia/Ukraine, China/Taiwan, the Middle East, Venezuela, or an African case) to inform a policy decision. Your briefing must explain root causes using the Instability Framework, connect the crisis to a concrete impact on American communities, and recommend a response while weighing its risks and benefits. **Product/Performance/Purpose**

- A written briefing memo (1–2 pages) with a map or visual.

Standards and Criteria for Success, including VoG Alignment

- Applies at least 3 factors from the Instability Framework to explain the hot spot's causes.
- Uses at least 4 credible, cited sources.
- Explicitly connects the hot spot to a concrete impact on American communities (economic, security, migration, or otherwise).
- Offers a specific, feasible recommendation and acknowledges at least one risk or counterargument to it.
- Briefing is organized, cites sources, and uses a visual (e.g., a map) accurately.

Resources

Any materials and resources related to the performance task that the teacher or student would need to be successful.

- Link to directions, rubric, and organizer.

Evaluative Criteria

How will you evaluate this task? How will you provide feedback to students?

- Link to directions, rubric, and organizer.

Comments

Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across three IDM inquiry arcs. Arc 1 builds a shared analytical framework for understanding instability and global interconnection. Arc 2 applies that framework across five real-world case studies — Russia/Ukraine, China, the Middle East, Venezuela, and Africa — using a station-rotation/jigsaw approach so the class can cover meaningful breadth within three lessons. Arc 3 turns the lens back home, asking how these hot spots affect American communities, and culminates in the GRASPS summative briefing. Because classes meet in 88-minute blocks, each lesson comfortably holds a staging/opening, a core inquiry task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table. Given the sensitivity of these topics, present each case study through balanced, factual overviews from reputable, nonpartisan sources (e.g., established news explainers, nonpartisan foreign-policy backgrounders) and make space for students to encounter more than one perspective on contested questions.

Inquiry Arc 1: Understanding Geopolitical (In)Stability (Lessons 1–2)

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Unit Compelling Question	Why should we care about conflicts happening halfway around the world?	
Standards & Practices	D2.Geo.7.9-12 (adapted); D2.Geo.4.9-12: Analyze relationships and interactions among human population, natural resources, and the environment.	
Staging the Question	"Where in the World?" map activity (~20 min): students view an unlabeled world map with 5–6 current hot spots marked and discuss, in pairs, what they already know or have heard about each location before the inquiry begins.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	What causes geopolitical instability, and how can we recognize it?	How are today's hot spots connected to broader global systems?
Formative Performance Task	(~55 min) Introduce the Instability Framework (political, economic, social, historical, external factors); apply it to one worked example (e.g., a simplified historical case) in small groups; complete a framework graphic organizer.	(~55 min) Explore how trade, alliances, resources, and migration connect regions (e.g., Ukrainian grain exports and global food prices; Taiwan's role in semiconductor production); complete a "ripple effects" concept map.
Featured Sources	*Brief explainer introducing categories of geopolitical instability; a short worked case example*	*Brief reading/infographic on global economic interdependence (trade routes, resource dependencies, supply chains)*

Inquiry Arc 2: Case Studies in Global Hot Spots (Lessons 3–5)

Unit Compelling Question	Why should we care about conflicts happening halfway around the world?		
Standards & Practices	D2.Civ.12.9-12 (adapted): Analyze the role of international agreements, alliances, and organizations in maintaining or disrupting global order.		
Staging the Question	Quick review (~10 min) of the Instability Framework from Lesson 2 before rotating into the unit's first case-study stations.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**

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Supporting Questions	What is driving instability in Russia/Ukraine and China's regional tensions, and what are the ripple effects?	What is driving instability in the Middle East and Venezuela, and what are the ripple effects?	What is driving instability in Africa's current hot spots, and what patterns recur across all the regions studied?
Formative Performance Task	(~75 min) Station rotation: small groups apply the Instability Framework to brief case materials on the Russia-Ukraine war and on China-Taiwan/South China Sea tensions; complete a comparison chart for each.	(~75 min) Station rotation: small groups apply the framework to brief case materials on Middle East regional instability (covering multiple flashpoints) and on Venezuela's political/economic crisis and migration; complete a comparison chart for each.	(~50 min) Station rotation on African case studies (e.g., Sahel coups, Sudan's civil war, conflict minerals in the DRC). (~25 min) Whole-class synthesis: gallery walk comparing all five case studies' completed frameworks to identify recurring patterns and key differences.
Featured Sources	*Brief, paraphrased nonpartisan overviews of the Russia-Ukraine war's causes and course, and of China-Taiwan/South China Sea tensions*	*Brief, paraphrased nonpartisan regional overview of Middle East instability (multiple flashpoints); brief overview of Venezuela's economic collapse and migration crisis*	*Brief, paraphrased nonpartisan overviews of recent African instability (Sahel coups, Sudan's civil war, DRC conflict minerals)*
	The Council of Foreign Relations has resources that could benefit this inquiry arc. This includes their Global Conflict Tracker, Causes and Costs of Conflict Lesson Plan, and the Tracking Global Conflict Activity.		

Inquiry Arc 3: Why It Matters to Us (Lessons 6–7)

Unit Compelling Question	Why should we care about conflicts happening halfway around the world?
Standards &	D2.Eco.15.9-12 (adapted): Evaluate the local, national, and global

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Practices	economic impact of foreign events and policies.	
Staging the Question	Quick-write (~10 min): “Name one thing you own, eat, or use that might be connected to a country experiencing conflict right now.” Share out to preview Arc 3.	
	Supporting Q1	**Supporting Q2**
Supporting Questions	How do events in global hot spots affect communities here at home?	What should the U.S. or international community do in response to a specific hot spot, and how do we communicate that recommendation effectively?
Formative Performance Task	(~65 min) Examine concrete local/U.S. connections — energy and gas prices, semiconductor supply chains, refugee resettlement, defense spending, diaspora communities; complete a “So Far Away, So Close” concept map linking a chosen hot spot to a specific U.S. impact.	(~88 min) GRASPS workshop: students choose a hot spot and draft their briefing memo using evidence gathered across the unit; structured peer feedback; deliver oral briefings to the panel; Taking Informed Action task assigned.
Featured Sources	*Brief news summaries/data on economic and social impacts (energy markets, supply-chain data, refugee resettlement statistics, diaspora community profiles)*	*Student-compiled Instability Framework organizers and case-study notes from Lessons 1–6*
Taking Informed Action (Optional)	**Understand:** Follow reputable coverage of your chosen hot spot for one week. **Assess:** Identify one specific way that hot spot is already affecting the U.S. or your local community. **Act:** Write a letter to a member of Congress, create a public-awareness resource for the school community, or contribute to a class “World in Brief” bulletin board that continues throughout the semester.	

Lesson-by-Lesson Sequence

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · SQ1	I will understand the causes of	I can locate different countries	A. “Where in the World?” map staging (~20 min)	Completed framework graphic	Geopolitical instability, sovereignty

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		geopolitical instability.	and conflicts on a map I can explain some causes of geopolitical instability I can apply the instability framework to a real-life example I can collaborate with my peers and listen to their perspectives	B. introduce the Instability Framework and apply it to a worked example in small groups (~55 min) C. closing debrief (~13 min). Lesson 1: Hot…	organizer for the worked example.	
2	Arc 1 · SQ2	I will understand how instability in one place can ripple outward due global interdependence.	I can identify central ideas in the text about global interdependence I can explain how global trade, alliances, resources, and migration connect regions to one another	A. Warm-up review (~10 min) B. explore global interdependence readings/infographics in small groups (~55 min) C. complete a “ripple effects” concept map and debrief (~23 min). Lesson 2: Hot…	Completed “ripple effects” concept map showing at least two global interconnections.	Global supply chain, sphere of influence

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can create a concept map to show how the world is connected			
3	Arc 2 · SQ3	I will apply the Instability Framework to explain tensions in Russia/Ukraine and China's regional disputes.	I can collaborate to identify central ideas from the text at each station I can compare and contrast the instability framework on Russia/Ukraine and China/Taiwan conflicts I can use new vocabulary terms to support my conclusion	A. Framework review (~10 min) B. station rotation applying the framework to Russia-Ukraine and China-Taiwan case materials (~65 min) C. comparison chart and debrief (~13 min). Lesson 3: Hot…	Comparison chart applying the Instability Framework to both case studies.	Proxy conflict, authoritarian-ism
4	Arc 2 · SQ4	I will apply the Instability Framework to explain instability in the Middle East and Venezuela.	I can collaborate to identify central ideas from the text at each station I can compare	A. Quick review (~8 min) B. station rotation applying the framework to Middle East and Venezuela case materials (~65 min)	Comparison chart applying the Instability Framework to both case studies.	Sanctions, displacement

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			and contrast the instability framework on Middle Eastern and Venezuelan conflicts I can use new vocabulary terms to support my conclusion I can compare the role of the United States in each case	C. comparison chart and debrief (~15 min). Lesson 4: Hot…		
5	Arc 2 · SQ5 (Arc 2 synthesis)	I will apply the Instability Framework to Africa's current hot spots. I will synthesize patterns across all five case studies we've learned about over the past few classes.	I can collaborate to identify central ideas from the text at each station I can compare and contrast the instability framework on African conflicts. I can write a paragraph that identifies	A. Station rotation on African case studies (~50 min) B. whole-class gallery-walk synthesis comparing all five case studies' frameworks (~25 min) C. synthesis discussion (~13 min). Lesson 5: Hot…	Comparison chart for the African case studies plus a short synthesis paragraph on recurring patterns across regions.	Coup d'état, diaspora

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			one pattern that appears in multiple regions, as well as a major difference between regions, using specific evidence.			
6	Arc 3 · SQ6	I will trace a concrete connection between a global hot spot and an impact on American communities.	I can use real current locally relevant data to make connections I can create a concept map to visualize my ideas	A. Quick-write staging (~10 min) B. examine local/U.S. connections (energy, supply chains, refugee resettlement, diaspora) in small groups (~55 min) C. complete “So Far Away, So Close” concept map and debrief (~23 min). Lesson 6: Hot…	Completed “So Far Away, So Close” concept map linking a chosen hot spot to a specific U.S. impact.	Review of all 10 terms
7	Arc 3 · SQ7 + Summative	I will synthesize evidence into a formal briefing regarding a global hot spot.	I can demonstrate my knowledge of unit vocab I can use evidence (4+ sources) to support my ideas	A. Vocabulary Quiz B. GRASPS workshop time to draft briefing memos using evidence from Lessons 1–6 (~35 min) C. structured peer feedback (~13 min)	GRASPS briefing memo and oral briefing scored with unit rubric; Taking Informed Action follow-through.	Applied use of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can present my ideas professionally and clearly	D. oral briefings to the panel (~35–40 min); E. Taking Informed Action task assigned. Lesson 7: Hot…		

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Unit Overview	
Unit Title:	Mind Matters: Mental Health & Social Media
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	8 Lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	In this unit, students will study the impact of social media and digital life on youth mental health. They will consider how the online world affects them and their peers, and evaluate plans and policies that try to manage this effect. This unit is designed to encourage students to explore topics also covered in Introduction to Psychology, AP Psychology, Introduction to Sociology, and American Culture classes.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Psy.2.9-12 Investigate the potential effects of individual and cultural differences on social interactions.
- D2.Psy.4.9-12 Analyze the effects of a range of factors on individual and collective behavior.
- D2.Psy.5.9-12 Investigate how social and cultural factors influence the development of self and identity.
- D2.Psy.6.9-12 Examine the effects of social and cultural factors on mental health and well-being.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.7 Integrate quantitative/technical analysis with qualitative analysis of a text.
- RH.9-10.8 Assess the extent to which the reasoning and evidence in a text support the author's claims.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.

- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).
- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.c Critique political arguments and explanations while acknowledging strengths and weaknesses given purpose and audience.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems using a multidisciplinary lens.
- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

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Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Mental health is a complex part of overall health and well-being; conditions like depression, anxiety, and ADHD are not simply the result of one behavior, technology, or personal choice. • Social media can have both positive and negative effects depending on how it's used, the individual, the content encountered, and the surrounding social environment. • Self-image, self-esteem, and self-efficacy are related but different concepts, and online environments can influence how people compare themselves with others. • Research evidence may reveal a relationship between variables without proving that one causes another. • Solutions to complex social problems require action at multiple levels — individual, interpersonal, institutional, and societal. • Young people can have agency in shaping healthier digital environments and supporting peers, without being expected to diagnose or treat mental health conditions.
Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: How Does Social Media Shape the Way Young People See Themselves?** • What is the difference between self-image, self-esteem, and self-efficacy? • How can social media influence social comparison and the way young people understand themselves? • Does social media cause poor mental health, or is the relationship more complicated? **Inquiry Arc 2: How Do Social Media Systems and Culture Affect Young People?** • How are social media platforms designed to capture and hold attention, and what are the effects? • What specific risks and pressures do young people navigate online? **Inquiry Arc 3: How Can We Support Mental Health in a Digitally Connected World?** • What are depression, anxiety, and ADHD, and how can they affect young people's experiences?

	• What factors beyond social media influence young people's mental health? • What actions can young people and their communities take to promote mental health and digital well-being?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Mental Health • Self-Image • Self-Esteem • Self-Efficacy • Social Media • Social Comparison • Depression • Anxiety • ADHD • Correlation • Algorithms • Echo Chambers • Rabbit Holes • Social Media Addiction • Cyberbullying • Body Image • Dangerous Viral Trends • Fear of Missing Out (FOMO) • Pressure to Conform • Sleep Disruption	• Define and distinguish related concepts (e.g., self-image, self-esteem, self-efficacy). • Analyze graphs, statistics, infographics, articles, and personal narratives; identify bias, limitations, and missing information. • Distinguish correlation from causation. • Construct evidence-based claims that acknowledge competing perspectives. • Develop realistic, evidence-based recommendations and communicate them to a specific audience.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal • Develop an evidence-based resource that helps young people understand the relationship between social media, self-perception, and mental health, and provides realistic recommendations for digital well-being. **Role** • You are a Youth Mental Health and Digital Well-Being Advisor working with a school, youth organization, or community organization.

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Audience

- Students in grades 9–12 who use social media and are navigating the pressures of being a young person today.

Situation

- A school or youth organization wants to help students understand how digital life and modern pressures can affect mental health, without oversimplified messages such as “social media is always harmful,” “social media causes depression,” “just stop using your phone,” or “mental health is only an individual problem.” They've asked for a resource grounded in research that recognizes the issue's complexity.

Product/Performance/Purpose

- Choose one: a digital or print Youth Mental Health and Digital Well-Being Guide, an evidence-based public service campaign, a school advisory presentation, or a resource for a school website or social media account.
- The product must include:
    - A clear explanation of how social media can affect young people's experiences.
    - An explanation of at least 3 of: self-image, self-esteem, self-efficacy, social comparison, depression, anxiety, ADHD.
    - At least 3 evidence-based claims supported by credible sources.
    - A discussion of at least one competing perspective or limitation.
    - At least 3 realistic recommendations for improving digital well-being or supporting mental health.
    - A clear statement that young people should not be expected to diagnose or treat themselves or others.
    - A section identifying when a young person should seek support from a trusted adult or qualified professional.

Standards and Criteria for Success, including VoG Alignment

- Accuracy — information is factually accurate and avoids stereotypes or stigmatizing language.
- Evidence — claims are supported by credible and relevant sources.
- Complexity — avoids simplistic claims about social media or mental health.
- Analysis — explains relationships among social media, self-perception, and mental health.
- Perspective — acknowledges competing views, limitations, or uncertainty.
- Audience Awareness — the resource is appropriate and useful for teenagers.
- Action — recommendations are realistic, specific, and evidence-based.

Resources

Any materials and resources related to the performance task that the teacher or student would need to be successful.

- Link to directions, rubric, and organizers

Evaluative Criteria

How will you evaluate this task? How will you provide feedback to students?

- Link to directions, rubric, and organizers

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across three IDM inquiry arcs. Arc 1 asks how social media shapes the way young people see themselves, distinguishing self-image, self-esteem, and self-efficacy and examining correlation vs. causation. Arc 2 turns to how social media platforms and culture actually work — algorithms, echo chambers, and the specific risks and pressures young people navigate online. Arc 3 asks how young people and their communities can support mental health in a digitally connected world, examining depression, anxiety, and ADHD alongside the many factors beyond social media that shape well-being — culminating in the GRASPS summative task. Because classes meet in 88-minute blocks, each lesson comfortably holds a staging/opening, a core inquiry task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table.

Facilitation note: throughout this unit, students are not being asked to diagnose themselves or their classmates. Everyday stress, sadness, or worry does not automatically mean someone has a mental health condition, and mental health conditions should never be used as labels for peers. If a student discloses genuine distress at any point, follow your school's standard protocol for connecting them with a counselor or other trusted adult — this unit is designed to build awareness and healthy habits, not to replace professional support.

Inquiry Arc 1: How Does Social Media Shape the Way Young People See Themselves? (Lessons 1–3)

Compelling Question	In a world where everyone is constantly connected, who gets to define who we are?
Standards & Practices	D2.Psy.5.9-12 — Investigate how social and cultural factors influence the development of self and identity. | D2.Psy.2.9-12 — Investigate the potential effects of individual and cultural differences on social interactions.
Staging the Question	Present statements such as “Social media makes teenagers feel worse about themselves,” “Social media helps teenagers feel less alone,” and “People only post the best parts of their lives.” Students respond Agree/Disagree/Unsure,

	then identify what they'd need to know before answering confidently.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	What is the difference between self-image, self-esteem, and self-efficacy?	How can social media influence social comparison and the way young people understand themselves?	Does social media cause poor mental health, or is the relationship more complicated?
Formative Performanc e Task	Rotate through short scenarios (edited images, negative comments, watching a peer succeed) and identify whether each relates to self-image, self-esteem, or self-efficacy; complete a Concept Relationship Map.	Using the same scenarios, analyze how each involves social comparison and how digital environments can amplify it.	Examine several claims about social media and mental health; determine what the evidence actually shows, what's missing, and whether it demonstrates correlation, causation, or neither; write an evidence-based response with a claim, two pieces of evidence, and one limitation.
Featured Sources	*A youth social media use survey/infographic; a short personal narrative from a teenager; composite scenario set*	*A short expert explanation of social comparison; the same composite scenario set*	*A graph showing patterns in adolescent social media use and mental health; brief summaries of relevant research findings*
Arc Summative Check	Inquiry Arc 1 Checkpoint: students return to the Arc 1 compelling question and write a preliminary answer, to be revisited at the end of the unit.		

Inquiry Arc 2: How Do Social Media Systems and Culture Affect Young People? (Lessons 4–5)

Compelling Question	How are social media platforms designed, and what risks do young people navigate as a result?
Standards & Practices	D2.Psy.4.9-12 — Analyze the effects of a range of factors on individual and collective behavior.
Staging the Question	Quick-write: “Have you ever opened an app to check one thing and ended up scrolling for much longer than you meant to? What do you think happened?” Share out to preview the arc.

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	Supporting Q1	Supporting Q2
Supporting Questions	How are social media platforms designed to capture and hold attention, and what are the effects?	What specific risks and pressures do young people navigate online?
Formative Performance Task	Read a short, accessible explainer on recommendation algorithms and engagement design; analyze a composite case study of algorithm-driven “rabbit holes” and echo chambers; discuss signs of social media addiction; complete a “How the Feed Works” diagram.	Station rotation covering cyberbullying, body image, FOMO, pressure to conform, dangerous viral trends, and sleep disruption; complete a Risk & Response chart identifying each risk, why it happens, and one healthy response.
Featured Sources	*Short, accessible explainer on recommendation algorithms and engagement design; a composite case study*	*Brief readings on each risk area (cyberbullying impact, body image and edited content, FOMO and notifications, peer pressure online, viral-challenge safety concerns handled generally, sleep and screen-time research)*
Arc Summative Check	Arc 2 Checkpoint: students identify which platform-design feature or risk factor feels most significant to their own peer group and explain why, citing at least one piece of evidence from the arc.	

Inquiry Arc 3: How Can We Support Mental Health in a Digitally Connected World? (Lessons 6–8)

Compelling Question	Who is responsible for protecting young people's mental health?		
Standards & Practices	D2.Psy.6.9-12 — Examine the effects of social and cultural factors on mental health and well-being.		
Staging the Question	Framing discussion before the arc begins: students are not being asked to diagnose themselves or classmates, and mental health conditions are complex and should never be used to stereotype or stigmatize peers.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	What are depression, anxiety, and ADHD, and how can they affect young people's experiences?	What factors beyond social media influence young people's mental health?	What actions can young people and their communities take to promote mental health and digital well-being?

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Formative Performance Task	Examine short informational sources on depression, anxiety, and ADHD in small groups, identifying what each is, how it may affect daily life, common misconceptions, and what support might help; complete a Mental Health Myth vs. Evidence Chart.	Examine a fictional case study using a Multiple Factors Model (individual, family/relationships, school, sleep/health, social media/technology, economic/community, cultural/social expectations); write a response identifying at least 3 interacting factors; discuss whether solutions should focus only on individual choices.	Categorize possible actions by level (individual, interpersonal, school/community, technology companies, government/society); complete the GRASPS resource; share/present; complete Taking Informed Action and a final reflection revisiting both compelling questions.
Featured Sources	*Short informational sources on depression, anxiety, and ADHD from credible mental-health organizations*	*The fictional case study; a brief reading introducing multiple-factors thinking about mental health*	*Student-compiled notes and evidence from Lessons 1–7 for the GRASPS resource*
Taking Informed Action (Optional)	**Understand:** Research how social media, self-perception, and mental health are connected. **Assess:** Evaluate what evidence suggests social media can create challenges, what evidence suggests it can provide benefits, what factors complicate the issue, and which groups have the greatest ability to create change. **Act:** Create and share an evidence-based resource for young people (outside of your class assignment). Possible authentic audiences: school administration, student government, the school counseling department, a youth organization, or a parent/family education program.		

Lesson-by-Lesson Sequence

Note:

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · Staging	I will investigate the relationship between social media, identity, and mental health.	I can examine real data and identify central ideas in charts and graphs I can break down the claim, evidence, and argument of an expert I can reflect on my own social media use I can consider what I still need to learn when it comes to social media and mental health I can create questions about the relationship between social media, identity, and mental health.	A. Present statements (“Social media makes teenagers feel worse about themselves,” etc.); students respond Agree/Disagree/ Unsure and identify what they'd need to know to answer confidently (~25 min) B. examine a youth social media use survey/infographic and a short personal narrative (~25 min) C. complete an Inquiry Question Board: what we think we know, what we wonder, what evidence we'd need (~25 min) D. exit ticket (~13 min). Lesson 1: …	Completed Inquiry Question Board plus exit ticket.	Mental Health, Social Media
2	Arc 1 · SQ1	I will distinguish self-image, self-esteem,	I can use new vocabulary terms to	A. Rotate through short scenarios (e.g., edited images,	Completed Concept Relationship Map.	Self-Image, Self-Esteem, Self-Efficacy,

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
	& SQ2	and self-efficacy, and analyze how digital environments influence social comparison.	evaluate scenarios I can collaborate with my peers to categorize scenarios and identify connections	negative comments, watching a peer succeed) and identify whether each relates to self-image, self-esteem, or self-efficacy (~35 min) B. analyze how the scenarios also involve social comparison and how digital environments amplify it (~25 min) C. complete a Concept Relationship Map (~28 min). Lesson 2: …		Social Compari-son
3	Arc 1 · SQ3 + Arc 1 Checkpoint	I will distinguish correlation from causation when evaluating claims about social media and mental health.	I can tell the difference between causation and correlation I can use evidence to support my opinion I can write a well supported and organized response	A. Examine several claims (e.g., “Social media causes depression”) and analyze what the evidence actually shows, what's missing, and whether it shows correlation, causation, or neither (~40 min)	Correlation vs. causation response plus Arc 1 Checkpoint answer.	Correlation

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
				B. write an evidence-based response: a claim, two pieces of evidence, and one limitation (~30 min) C. Arc 1 Checkpoint: preliminary written answer to the Arc 1 compelling question (~18 min). Lesson 3: …		
4	Arc 2 · Staging + SQ1	I will understand how algorithms and engagement driven design work.	I can read and annotate the text to locate central ideas I can explain how a recommendation algorithm decides what content to show a user. I can define echo chamber and rabbit hole, and explain how they're related but different. I can construct an	A. Read a short, accessible explainer on recommendation algorithms, engagement design, and notifications (~25 min) B. analyze a composite case study of someone who intended to watch one video and ended up far afield; discuss echo chambers, content rabbit holes, and signs of social media addiction (~35 min)	Completed “How the Feed Works” diagram.	Algorithms, Echo Chambers, Rabbit Holes, Social Media Addiction

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			explanation using sound reasoning, correct sequence, and pertinent details tracing how a realistic scenario moves from algorithm → engagement → echo chamber/rabbit hole → possible overuse I can identify signs of overuse without pathologizing normal, everyday social media use. I can explain how social media platforms are designed to capture attention and where that can lead.	C. complete a "How the Feed Works" diagram tracing algorithm → engagement → echo chamber/rabbit hole → possible overuse (~28 min). Lesson 4: …		
5	Arc 2 · SQ2 +	I will understand specific risks and pressures	I can collaborate with my peers to gather	A. Station rotation covering cyberbullying, body image,	Completed Risk & Response chart plus Arc 2	Cyberbully-ing, Body Image,

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
	Arc 2 Checkpoint	young people navigate online and realistic responses to them.	relevant information from multiple real sources covering six distinct online risks I can identify causes of, effects of, and responses to risks online I can reflect and share my opinion with my classmates, while listening to theirs I can distinguish which risk feels most significant to my own peer group and explain why, using reasoning rather than assumption.	FOMO, pressure to conform, dangerous viral trends, and sleep disruption, each with a brief reading and discussion questions (~55 min) B. complete a Risk & Response chart identifying each risk, why it happens, and one healthy response (~20 min) C. Arc 2 Checkpoint: which factor feels most significant to your peer group, and why? (~13 min). Lesson 5: …	Checkpoint response.	Dangerous Viral Trends, FOMO, Pressure to Conform, Sleep Disruption
6	Arc 3 · Staging + SQ1	I will examine the effects of social and cultural factors on mental health and well-being by	I can define depression, anxiety, and ADHD using accurate clinical information	A. Framing discussion: students are not being asked to diagnose themselves or classmates, and	Completed Mental Health Myth vs. Evidence Chart.	Depression, Anxiety, ADHD

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		learning accurate, evidence-based information about depression, anxiety, and ADHD	from authoritative sources. I can identify at least one common misconception about each condition and the evidence that corrects it. I can describe how each condition may affect daily functioning and what kind of support might help. I can engage with this material as an academic subject, without diagnosing myself or my classmates.	everyday stress or worry doesn't automatically mean a condition is present (~13 min) B. examine short informational sources on depression, anxiety, and ADHD in small groups, identifying what each is, how it may affect daily life, common misconceptions, and what support might help (~50 min) C. complete a Mental Health Myth vs. Evidence Chart (~25 min). Lesson 6: …		
7	Arc 3 · SQ2	I will analyze the characteristics and causation of a young person's mental health challenges using a	I can identify evidence for each of the seven Multiple Factors Model categories within a single narrative.	A. Examine a fictional case study of a stressed, overwhelmed student facing academic pressure, a changed friend	Multiple Factors Model response identifying at least 3 interacting factors.	Review of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		multidisciplinary lens spanning individual, family, school, health, technology, economic, and cultural factors	I can construct an explanation, using sound reasoning and pertinent details, of how at least 3 factors interact rather than operate independently I can critique the assumption that solutions to complex problems should focus on individual choices alone I can participate in a discussion and listen to others' ideas	group, poor sleep, and heavy social media use (~15 min) B. analyze the case using a Multiple Factors Model (individual, family/relationships, school, sleep/health, social media/technology, economic/community, cultural/social expectations) (~40 min) C. write a response identifying at least 3 interacting factors (~20 min) D. discuss: should solutions focus only on individual choices? (~13 min). W Lesson 7: …		
8	Arc 3 · SQ3 + Sum	I will develop realistic, evidence-based recommendations for	I can demonstrate my knowledge of unit vocab	A. Vocabulary Quiz B. Categorize possible actions by level — individual,	GRASPS resource scored with the unit rubric; Taking Informed Action	Applied use of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
	mative	supporting youth mental health and digital well-being.	I can categorize possible actions by level — individual, interpersonal, school/community, technology companies, and government/society I can construct an evidence-based resource that acknowledges competing perspectives and limitations I can present my resource to reach an audience beyond the classroom I can identify realistic, specific recommendations while clearly stating that young people should not diagnose	interpersonal, school/community, technology companies, government/society (~20 min) C. GRASPS workshop time to complete the Youth Mental Health & Digital Well-Being resource (~45 min) D. share/present resources (~23 min); remaining work may extend to a following period. E. Taking Informed Action and final reflection assigned. Lesson 8: …	follow-through; final reflection.	

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			or treat themselves or others.			

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Unit Overview	
Unit Title:	Safeguarding Society: Navigating Public Safety, Gun Rights, Ownership, Control, and Prison Policy
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	6 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	In this unit, students will examine how American society balances individual rights with public safety. They will study the second amendment, public safety policy, and the criminal justice system. This unit is designed to encourage students to explore topics also covered in Criminal Justice, Introduction to Sociology, and Human Rights classes.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Civ.1.9-12 Distinguish the powers and responsibilities of citizens, interest groups, and media in shaping public policy.
- D2.Civ.5.9-12 Evaluate citizens' and institutions' effectiveness in addressing social and political problems.
- D2.Civ.14.9-12 Analyze historical, contemporary, and emerging means of changing societal systems to promote the common good.
- D2.His.16.9-12 (adapted) Integrate evidence from multiple relevant sources and interpretations into a reasoned argument.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.7 Integrate quantitative/technical analysis with qualitative analysis of a text.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.
- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).
- WHST.9-10.2 Write informative/explanatory texts.

- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.1 Initiate and participate effectively in collaborative discussions.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.c Critique political arguments and explanations while acknowledging strengths and weaknesses given purpose and audience.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.

ONLY IF Taking Informed Action Task is Completed:

- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

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Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• The Second Amendment's meaning has been shaped by ongoing constitutional interpretation, and reasonable people disagree about its scope. • Public safety policy requires balancing competing values — individual rights, liberty, safety, fairness, and cost — and no policy satisfies every value at once. • Data on gun violence and incarceration can support different conclusions depending on framing, comparison groups, and underlying assumptions. • The criminal justice system serves multiple, sometimes competing goals — deterrence, incapacitation, rehabilitation, and retribution — and policy debates often reflect disagreement over which goal should be prioritized. • Civic engagement (testimony, advocacy, voting) is a legitimate way citizens influence public safety policy in a democracy.
Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Unit Compelling Question:** • How should American society balance individual rights with public safety? **Inquiry Arc 1: Guns in America** • What does the Second Amendment protect, and how have courts interpreted it? • What does the data show about gun ownership, gun violence, and existing regulations in the U.S.? • What is the range of perspectives on gun-control policy, and what trade-offs do they involve? **Inquiry Arc 2: Prisons & Punishment** • What are the goals of the U.S. criminal justice/prison system? • What does the data show about incarceration rates, recidivism, and disparities in the U.S.? • What reforms have been proposed or implemented, and what perspectives compete around them?

What will students <u>know...</u>	**What will students <u>be able to do…</u>**

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Factual information, vocabulary and basic concepts related to each standard/goal	Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Second Amendment • Gun Control • Background Check • Red flag law • Concealed/open carry • Mandatory minimum sentencing • Recidivism • Mass incarceration • Rehabilitation • Restorative justice	• Read and interpret a primary legal source (constitutional text, court-case summaries). • Interpret and analyze quantitative public-safety data (rates, trends, comparisons). • Evaluate the credibility and perspective of a source on a contested issue. • Distinguish correlation from causation in public-safety claims. • Construct an evidence-based written and oral argument that acknowledges counterclaims. • Engage in civil, evidence-based discourse about a highly contested policy issue.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal • Research and propose a public-safety policy — choosing either a Gun Policy track or a Criminal Justice Reform track — for consideration by a state legislative committee, balancing rights, evidence, and public safety. **Role** • You are a Legislative Policy Aide for a state Senate Public Safety Committee. **Audience** • The Committee panel (teacher and/or guest evaluators role-playing senators). **Situation** • The Committee is holding hearings on proposed legislation. You will choose a specific real or realistic bill within one track, research its constitutional and/or systemic considerations and supporting data, evaluate at least two competing viewpoints, and draft a recommendation with testimony. **Product/Performance/Purpose** • A written policy brief (2–3 pages) and 5-minute committee testimony with a data visual, addressing the compelling question directly. **Standards and Criteria for Success, including VoG Alignment**

- Uses at least 4 pieces of credible, cited evidence/data representing more than one perspective.
- Correctly applies at least 4 unit vocabulary terms.
- Addresses relevant constitutional considerations (Gun Policy track) or systemic/data considerations (Criminal Justice track).
- Evaluates trade-offs and directly addresses at least one counterargument.
- Proposal is specific and feasible (implementation, stakeholders, cost).
- Testimony is organized, civil in tone, cites sources, and uses a data visual accurately.

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

- Link to directions, rubric, and tracks

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

- Link to directions, rubric, and tracks

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across two IDM inquiry arcs. Arc 1 examines the constitutional, empirical, and political dimensions of gun rights and gun regulation. Arc 2 turns to the goals, realities, and reform of the U.S. prison system. Both arcs return to the same compelling question and feed a single GRASPS summative task, in which students choose a Gun Policy or Criminal Justice Reform track. Because classes meet in 88-minute blocks, each lesson below is written to comfortably hold a staging/opening, a core inquiry task, and a closing synthesis within one period — pacing suggestions are noted in the Key Activities column of the lesson table.

Inquiry Arc 1: Guns in America — Rights, Ownership & Regulation (Lessons 1–3)

Unit Compelling Question	How should American society balance individual rights with public safety?
Standards &	D2.Civ.1.9-12; D2.His.16.9-12 (adapted): Integrate evidence from multiple

Practices	sources into a reasoned argument about a current constitutional issue.		
Staging the Question	"Four Corners" activity (~15 min): students move to a corner (strongly agree / agree / disagree / strongly disagree) in response to statements such as "The government should be able to limit what types of firearms civilians can own," then discuss with others in their corner before the inquiry begins.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	What does the Second Amendment protect, and how have courts interpreted it?	What does the data show about gun ownership, gun violence, and existing regulations in the U.S.?	What is the range of perspectives on gun-control policy, and what trade-offs do they involve?
Formative Performance Task	(~50 min) Read the full text of the Second Amendment plus paraphrased case-brief summaries of Heller and McDonald; complete a case-brief graphic organizer, then answer: what does the Amendment protect, and what limits has the Court allowed?	(~55 min) Analyze survey data on gun-ownership attitudes and summarized state-by-state regulation data (background checks, red-flag laws); complete a data-analysis worksheet distinguishing correlation from causation.	(~50 min) Structured academic controversy using two brief, paraphrased position summaries (rights/self-defense emphasis vs. public-safety/regulation emphasis); write a claim-evidence-reasoning paragraph acknowledging the other side; revisit the Lesson 1 four corners to see if views shifted.
Featured Sources	*Full text of the Second Amendment; paraphrased case-brief summaries of District of Columbia v. Heller (2008) and McDonald v. Chicago (2010)*	*Pew Research survey data on gun-ownership attitudes; summarized federal/state data on background-check and red-flag-law policies*	*Two brief, paraphrased position summaries representing different general viewpoints on gun policy*

Inquiry Arc 2: Prisons & Punishment — Policy and Reform (Lessons 4–6)

Unit Compelling Question	How should American society balance individual rights with public safety?

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Standards & Practices	D2.Civ.5.9-12; D2.Civ.14.9-12: Analyze historical, contemporary, and emerging means of changing societal systems to promote the common good.		
Staging the Question	Quick-write and share-out (~15 min): “What is prison for?” Students individually list what they believe prison’s purpose is; teacher sorts responses into four categories — deterrence, incapacitation, rehabilitation, retribution — to preview Arc 2.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	What are the goals of the U.S. criminal justice/prison system?	What does the data show about incarceration rates, recidivism, and disparities in the U.S.?	What reforms have been proposed or implemented, and what perspectives compete around them?
Formative Performance Task	(~50 min) Read a short explainer on the four purposes of punishment; analyze brief policy scenarios (e.g., a three-strikes law, a drug court, a parole decision) and identify which purpose(s) each primarily serves.	(~55 min) Analyze incarceration-rate, recidivism, and disparity data, including an international comparison; complete a data-interpretation worksheet with guiding questions on causation vs. correlation.	(~55 min) Jigsaw of reform approaches (sentencing reform, restorative justice programs, reentry/job-training programs, enhanced-sentencing approaches); each group presents goals/evidence/critiques; whole-class discussion of trade-offs.
Featured Sources	*Short explainer reading on the purposes of punishment; brief sentencing-policy scenario descriptions*	*Bureau of Justice Statistics incarceration data; Sentencing Project or Pew data on recidivism and disparities; brief international-comparison graphic*	*Brief, paraphrased nonpartisan summaries of specific reform policies/programs; short profile of a restorative-justice or reentry program*
Taking Informed Action (Optional)	**Understand:** Research an actual gun-policy or criminal-justice bill currently pending in Congress or your state legislature, matching your chosen GRASPS track. **Assess:** Identify who supports and opposes the bill and why; evaluate		

	the rights, safety, and cost trade-offs involved. **Act:** Write a letter or email to a legislator, or draft and deliver simulated public testimony stating an evidence-based position, or design a public-awareness infographic for the school community.

Lesson-by-Lesson Sequence

Note: Note: with 88-minute blocks, Lesson 6 comfortably holds the GRASPS workshop, peer feedback, and testimony within one period for most classes. For a 7-lesson version, split Lesson 6 into a workshop/peer-feedback day and a separate testimony/presentation day.

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · SQ1	I will understand the Second Amendment's protections and limitations	I can share my opinion and listen respectfully to other opinions I can identify what the Second Amendment's text protects. I can summarize the core holdings of District of Columbia v. Heller (2008) and McDonald v. City of Chicago I can construct an explanation, using sound reasoning and pertinent	A. Four-corners staging (~15 min); B. read Second Amendment text and paraphrased Heller/McDonald case-brief summaries; complete case-brief organizer (~50 min) C. closing synthesis (~20 min). Lesson 1: S…	Case-brief graphic organizer plus a short written answer on what the Amendment protects and what limits courts have allowed.	Second Amend-ment

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			details, of what limits the Supreme Court has said remain constitutional I can gather and synthesize information from multiple legal sources representing this issue			
2	Arc 1 · SQ2	I will analyze data on gun ownership, gun violence, and existing regulations, and distinguish correlation from causation.	I can analyze real survey data on gun ownership and attitudes to identify specific patterns. I can analyze real state-by-state regulation data to identify specific patterns. I can collaborate to gather and synthesize information from multiple data sources representing this issue	A. Warm-up review (~10 min) B. small-group analysis of ownership-attitude survey data and state regulation summaries (~55 min) C. data-analysis worksheet and debrief (~20 min). Lesson 2: S…	Completed data-analysis worksheet identifying at least two patterns and one correlation-vs-causation caution.	Gun control, background check, red flag law, concealed/open carry

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can distinguish correlation from causation, identifying what additional evidence would be needed before concluding one thing caused another.			
3	Arc 1 · SQ3 (Arc 1 synthesis)	I will critique political arguments and explanations while acknowledging their strengths and weaknesses given their purpose and audience	I can accurately explain both a rights/self-defense-emphasis position and a public-safety/regulation-emphasis position on gun policy. I can collaborate to explain points of genuine agreement and disagreement between these two perspectives	A. Structured academic controversy using two brief, paraphrased position summaries (~55 min) B. revisit Lesson 1 four corners to check for shifts in thinking (~15 min) C. synthesis discussion (~15 min). Lesson 3: S…	Claim-evidence-reasoning paragraph identifying the more persuasive argument while acknowledging the other side.	Review of Arc 1 terms

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can write a claim-evidence-reasoning paragraph that identifies the more persuasive argument while fairly acknowledging the other side.			
4	Arc 2 · SQ4	I will analyze contemporary means by which societal systems address crime and punishment in pursuit of the common good.	I can identify the four purposes of punishment (deterrence, incapacitation, rehabilitation, retribution) I can construct an explanation, using sound reasoning and pertinent details, of which purpose(s) a specific policy primarily serves I can collaborate to analyze how a specific policy attempts to change or	A. “What is prison for?” quick-write and sort staging (~15 min) B. read purposes-of-punishment explainer and analyze policy scenarios in small groups (~50 min) C. graphic organizer and debrief (~20 min). Lesson 4: S…	Completed graphic organizer matching each scenario to the purpose(s) of punishment it primarily serves.	Rehabili-tation

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			maintain a societal system in pursuit of public safety.			
5	Arc 2 · SQ5	I will evaluate institutions' effectiveness in addressing a social problem using real quantitative evidence	I can analyze real incarceration, recidivism, and disparity data to identify specific patterns. I can construct an explanation, using sound reasoning and pertinent details, of what a specific data pattern does and does not establish I can identify competing explanations for a data pattern and what additional evidence would be needed to evaluate them.	A. Review of key terms (~10 min) B. small-group data-interpretation stations using BJS/Sentencing Project data and an international-comparison graphic (~55 min) C. worksheet and whole-class debrief (~20 min) Lesson 5: S…	Data-interpretation worksheet with guiding questions on causation vs. correlation.	Mandatory minimum senten-cing, recidivism, mass incarcer-ation

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can collaborate with my peers to understand charts and graphs			
6	Arc 2 · SQ6 + Summative	I will evaluate proposed criminal-justice reforms and construct an evidence-based policy proposal addressing the compelling question.	I can demonstrate my knowledge of unit vocab I can evaluate real reform approaches and their documented outcome I can organize and prioritize evidence from multiple sources to strengthen a policy claim I can refine my claim by addressing the strengths and limitations of a counterargument I can construct an argument using precise, cited	A. Vocabulary Quiz B. Jigsaw of reform approaches (~40 min) C. GRASPS workshop time and structured peer feedback (~35 min) D. committee testimony/presentations (~10–13 min, or use as a separate 7th-lesson presentation day) E. Taking Informed Action task assigned. Lesson 6: S…	Jigsaw notes; GRASPS policy brief and testimony scored with unit rubric; Taking Informed Action letter, testimony, or infographic.	Restorative justice; applied use of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			evidence while acknowledging counterclaims I can present my argument to an audience beyond the classroom I can provide reasonable feedback to a peer and use their feedback to improve my work			

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Unit Overview	
Unit Title:	The State of Education: What Makes an Effective School System?
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	6 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	In this unit, students will consider what factors make school systems effective or ineffective. They will examine how different schools measure success, and compare and contrast schools around the world. This unit is designed to encourage students to explore topics also covered in Introduction to Teaching, Introduction to Psychology, AP Psychology, and Child Development classes.

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.Civ.4.9-12 (adapted) Explain the role of civic institutions, including public schools, in shaping opportunity and civic participation.
- D2.Civ.7.9-12 (adapted) Apply civic virtues and democratic principles when proposing solutions to public institutions and systems.
- D2.Geo.5.9-12 Evaluate how political, economic, and cultural decisions influence the characteristics of places, systems, and institutions across regions.
- D2.Eco.13.9-12 (adapted) Evaluate the local, state, and national effects of a government policy on economic and social outcomes.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.7 Integrate quantitative/technical analysis with qualitative analysis of a text.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.
- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence, counterclaim).
- WHST.9-10.2 Write informative/explanatory texts.

- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.1 Initiate and participate effectively in collaborative discussions.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:

- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums, using origin/authority/context to guide selection.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.c Critique political arguments and explanations while acknowledging strengths and weaknesses given purpose and audience.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems using a multidisciplinary lens.

ONLY IF Taking Informed Action Task is Completed:

- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:

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Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Educational systems reflect a society's values and priorities. • There is no universally "perfect" education system. • Policies have intended and unintended consequences. • Educational success is measured differently across cultures. • Evidence and multiple perspectives are necessary for evaluating policy.

Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: How Should Schools Measure Success?** • How do different countries organize education? • What are the benefits and drawbacks of standardized testing? • Do international rankings tell the whole story? **Inquiry Arc 2: What Should Schools Change to Prepare Students for the Future?** • Should schools assign homework? • Should schools change the school week or school day? • What can we learn from other countries?

What will students <u>know...</u>	**What will students <u>be able to do…</u>**
Factual information, vocabulary and basic concepts related to each standard/goal	Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material

• Standardized testing • PISA • Equity • Equality • Curriculum • Educational Policy • Achievement Gap • School Choice • Student Well-Being • Inquiry	• Analyze data to compare educational systems across countries. • Interpret informational texts and evaluate policy proposals. • Construct evidence-based arguments (CER) that address counterarguments. • Collaborate with peers to solve authentic problems. • Evaluate the credibility and relevance of sources representing multiple perspectives.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence
What will the student produce? Use the GRASPS model below to design your performance task.

Goal
- Design a proposal for improving secondary education using evidence from global education systems.

Role
- You are an Educational Policy Consultant.

Audience
- The State Board of Education.

Situation
- The state wants to redesign high school to better prepare students for college, careers, and citizenship. Your consulting team has been hired to recommend changes.

Product/Performance/Purpose
- Choose one: a presentation, a policy brief, an infographic, or a video proposal.
- The product must address all of the following:
  - School Structure — calendar, schedule, start time, testing, homework.
  - Curriculum — graduation requirements, electives, career pathways, technology.
  - Student Supports — mental health, extracurriculars, wellness.
  - Global Evidence — at least three recommended policy changes, supported by evidence and data from at least three countries.
  - Consideration of counterarguments and a realistic implementation plan.
  - A closing reflection explaining why the redesigned school would better prepare students for adulthood.

Standards and Criteria for Success, including VoG Alignment
- Supports claims with evidence.
- Compares at least three countries.
- Addresses opposing viewpoints.
- Recommends realistic, feasible solutions.
- Presents professionally, appropriate to the chosen format.

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Resources Any materials and resources related to the performance task that the teacher or student would need to be successful.
• Link to directions, rubric, and organizer

Evaluative Criteria How will you evaluate this task? How will you provide feedback to students?
• Link to directions, rubric, and organizer

Comments Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.
• Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

Stage 3: Learning Plan

Overview: This unit unfolds across two IDM inquiry arcs. Arc 1 asks how schools should measure success, comparing education systems across countries and examining standardized testing and international rankings. Arc 2 asks what schools should change to prepare students for the future, examining homework policy, school schedules, and lessons from other countries — culminating in the GRASPS summative task. Because classes meet in 88-minute blocks, each lesson comfortably holds a staging/opening, a core inquiry task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table.

Inquiry Arc 1: How Should Schools Measure Success? (Lessons 1–3)

Compelling Question	How should schools measure success?
Standards & Practices	D2.Geo.5.9-12 — Evaluate how political, economic, and cultural decisions influence the characteristics of places, systems, and institutions across regions. | D2.Eco.13.9-12 (adapted) — Evaluate the effects of government policy on economic and social outcomes.
Staging the Question	Gallery walk with images and headlines — Finland's minimal standardized testing, South Korea's long school days, expanding four-day school weeks in the U.S., students sleeping less than recommended, and the U.S.'s high per-student spending. Students respond to: “What makes a school successful?”

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	Supporting Q1	Supporting Q2	Supporting Q3
Supporting Questions	How do different countries organize education?	What are the benefits and drawbacks of standardized testing?	Do international rankings tell the whole story?
Formative Performance Task	Complete a comparison chart of school year, school hours, testing, homework, and graduation requirements across Finland, Japan, the United States, Singapore, and Canada.	Read research supporting and criticizing standardized testing plus student opinion articles; complete a Pros/Cons T-chart; write a CER paragraph answering "Should standardized testing play a major role in schools?"	In small groups, analyze PISA and OECD graphs alongside student well-being reports, answering: What patterns exist? Which countries perform well? What factors besides scores matter?
Featured Sources	*OECD PISA overview; World Bank education profiles; country education fact sheets*	*Research supporting standardized testing; research criticizing standardized testing; student opinion articles*	*Latest PISA results; OECD data; student well-being reports*
Arc Summative Check	Inquiry Arc 1 Summative Argument: students answer "How should schools measure success?" using evidence gathered across the arc.		

Inquiry Arc 2: What Should Schools Change to Prepare Students for the Future? (Lessons 4–6)

Compelling Question	What should schools change to prepare students for the future?
Standards & Practices	D2.Civ.4.9-12 (adapted) — Explain the role of civic institutions, including public schools, in shaping opportunity and civic participation. | D2.Civ.7.9-12 (adapted) — Apply civic virtues and democratic principles when proposing solutions to public institutions.

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Staging the Question	Quick-write: “How much homework is too much — or not enough?” Students share initial reactions before the arc's inquiry begins.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	Should schools assign homework?	Should schools change the school week or school day?	What can we learn from other countries?
Formative Performance Task	Analyze homework research, student surveys, and parent and teacher perspectives; create a recommendation for homework policy.	Structured Academic Controversy: teams debate which policy — a four-day school week or later start times — would improve schools more, considering mental health, transportation, athletics, and family schedules.	Revisit Finland, Singapore, Japan, Canada, and Estonia; each group identifies one policy worth adopting, possible challenges, and expected outcomes.
Featured Sources	*Homework research studies; student surveys; parent perspectives; teacher perspectives*	*American Academy of Pediatrics guidance; RAND research; district case studies*	*Country education profiles for Finland, Singapore, Japan, Canada, and Estonia*
Arc Summative Check	Inquiry Arc 2 Summative Argument: students answer “What should schools change to prepare students for the future?” using evidence gathered across the arc.		
Taking Informed Action (Optional)	**Understand:** Investigate an educational issue currently being debated in your state or community. **Assess:** Evaluate the potential impacts on students, teachers, families, and taxpayers using evidence from the unit. **Act:** Choose one: write a letter to a school board member, create an informational social media campaign, present recommendations to administrators, or develop a student survey and share findings with school leadership.		

Lesson-by-Lesson Sequence

Note:

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · Staging + SQ1	I will evaluate how political, economic, and cultural decisions influence the characteristics of education systems across regions	I can collaborate to compare how different countries organize their education systems. I can explain how new questions emerge when comparing varied education systems I can construct an explanation, using sound reasoning and pertinent details, of the differences across five real countries' school systems	A. Gallery walk staging with headlines/images (Finland's minimal testing, South Korea's long school days, expanding four-day weeks, student sleep data, U.S. per-student spending); respond to “What makes a school successful?” (~25 min) B. introduce the inquiry process and today's focus (~10 min) C. complete a 5-country comparison chart (Finland, Japan, U.S., Singapore, Canada) covering school year, hours, testing, homework, and graduation requirements (~40 min) D. debrief (~13 min). Lesson 1: St…	Completed 5-country comparison chart.	Curriculum, Educational Policy, Inquiry
2	Arc 1 · SQ2	I will evaluate the effects of educational policy on social outcomes,	I can collaborate to evaluate the benefits and drawbacks of standardized testing using	A. Warm-up review (~10 min) B. read research supporting and criticizing standardized testing, plus	Pros/Cons T-chart plus CER paragraph.	Standardized Testing, Achievement Gap

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		including its intended and unintended consequences	real, current evidence. I can explain points of genuine agreement and disagreement among researchers and stakeholders on this issue	student opinion articles, in small groups (~35 min) C. complete a Pros/Cons T-chart (~20 min) D. write a CER paragraph answering "Should standardized testing play a major role in schools?" (~23 min). Lesson 2: St…		
3	Arc 1 · SQ3 + Arc 1 Summative	I will evaluate how political, economic, and cultural decisions influence the characteristics of education systems across regions	I can evaluate whether international rankings tell the whole story about school success. I can collaborate to construct an explanation, using sound reasoning and pertinent details, of patterns in real PISA and well-being data in charts and graphs I can write an evidence-based argument	A. Review of key terms (~10 min) B. small groups analyze PISA/OECD graphs and student well-being reports, answering: What patterns exist? Which countries perform well? What factors besides scores matter? (~45 min) C. Arc 1 Summative Argument: written response to "How should schools measure success?" using evidence from the arc (~33 min). Lesson 3: St…	Graph-analysis notes plus Arc 1 Summative Argument.	PISA, Equity, Equality

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			answering the Arc 1 compelling question, integrating evidence from across the arc			
4	Arc 2 · Staging + SQ1	I will apply civic virtues and democratic principles when proposing solutions to a public institution	I can construct an evidence-based recommendation for school homework policy. I can collaborate to analyze homework research I can explain how a policy's intended and unintended consequences relate to student well-being. I can support a claim with specific evidence from research and multiple stakeholder perspectives	A. Staging quick-write: “How much homework is too much — or not enough?” (~10 min) B. analyze homework research, student surveys, and parent/teacher perspectives in small groups (~45 min) C. draft a homework-policy recommendation (~33 min). Lesson 4: St…	Written homework-policy recommendation supported by evidence.	Student Well-being
5	Arc 2 · SQ2	I will examine political	I can construct and defend an argument	A. Review of key terms (~10 min)	Structured Academic Controversy	Review of Arc 1 & 2 terms

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		arguments and explanations related to the 4-day school week while acknowledging their strengths and weaknesses given their purpose and audience	about school schedule reform using real evidence. I can explain points of genuine agreement and disagreement between competing school-schedule proposals I can address a counterargument fairly and directly. I can participate in the Structured Academic Controversy Protocol	B. Structured Academic Controversy: teams research and debate four-day school weeks vs. later start times using AAP, RAND, and district case-study evidence, addressing mental health, transportation, athletics, and family schedules (~65 min) C. debrief (~13 min). Lesson 5: St…	notes and participation, scored with a discussion rubric.	
6	Arc 2 · SQ3 + Summative Launch	I will design a proposal for improving a public institution using evidence from multiple sources, applying civic virtues and democratic principles	I can identify policies worth adopting from other countries and analyze possible challenges and expected outcomes. I can write an evidence-based argument answering the	A. Vocab Check B. Revisit Finland, Singapore, Japan, Canada, and Estonia in groups; each group identifies one policy worth adopting, possible challenges, and expected outcomes (~35 min) C. Arc 2 Summative Argument: written	Country policy-analysis notes; Arc 2 Summative Argument; GRASPS proposal and presentation scored with the unit rubric; Taking Informed Action follow-through.	School Choice; applied use of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			Arc 2 compelling question I can organize and prioritize evidence from at least three countries to support a policy recommendation I can present an argument to reach an audience beyond the classroom	response to “What should schools change to prepare students for the future?” (~20 min) D. launch the GRASPS “Redesign High School” task, form teams, and begin work time (~33 min); remaining GRASPS work and presentations extend to subsequent class periods. Taking Informed Action task assigned. Lesson 6: St…		

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Unit Overview	
Unit Title:	Who Owns Culture? Cultural Appropriation, Appreciation, and Representation
Teacher(s):	Heather Allenback, Colleen Money
Grade Level/Course:	9th and 10th
Length/Dates:	6 lessons
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	In this unit, students will study how culture is transferred from one group to another. They will consider the difference between intent and impact. Finally, students will make connections between cultural transfer and the economy. This unit is designed to encourage students to explore topics also covered in American Culture, Introduction to Sociology, and AP Human Geography classes

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

College, Career, and Civic Life (C3) Framework for Social Studies State Standards:

- D2.His.1.9-12 Evaluate how historical events and developments were shaped by unique circumstances of time and place, as well as broader historical contexts.
- D2.His.4.9-12 Analyze complex and interacting factors that influenced the perspectives of people during different historical eras.
- D2.Eco.1.9-12 Analyze how incentives influence choices that may result in policies with a range of costs and benefits for different groups.
- D2.Civ.14.9-12 Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights.

Common Core State Standards:

- RH.9-10.1 Cite specific textual evidence to support analysis, attending to source date and origin.
- RH.9-10.2 Determine the central ideas of a source and provide an accurate summary.
- RH.9-10.4 Determine the meaning of domain-specific words and phrases.
- RH.9-10.6 Analyze how an author's point of view or purpose shapes the content and style of a text.
- RH.9-10.9 Compare treatments of the same topic across multiple sources.
- WHST.9-10.1 Write arguments focused on discipline-specific content (claim, evidence,

counterclaim).
- WHST.9-10.2 Write informative/explanatory texts.
- WHST.9-10.9 Draw evidence from informational texts to support analysis and research.
- WHST.9-10.10 Write routinely over shorter time frames for a range of tasks.
- SL.9-10.4 Present information, findings, and evidence clearly and persuasively.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

Connecticut Elementary and Secondary Social Studies Inquiry Arc:
- Inq.1.a Explain how a question reflects an enduring issue in the field.
- Inq.1.b Explain how supporting questions contribute to an inquiry and how new questions emerge when engaging varied-perspective sources.
- Inq.1.c Explain points of agreement and disagreement experts have about compelling and supporting questions.
- Inq.3.b Organize and prioritize evidence from multiple sources to develop or strengthen claims.
- Inq.3.c Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations.
- Inq.4.a Construct arguments using precise, knowledgeable claims with evidence, acknowledging counterclaims and evidentiary weaknesses.
- Inq.4.b Construct explanations using sound reasoning, correct sequence, and pertinent details.
- Inq.4.d Present arguments and explanations to reach audiences outside the classroom using print, oral, or digital technologies.
- Inq.4.e Analyze the characteristics and causation of local, regional, and global problems using a multidisciplinary lens.

ONLY IF Taking Informed Action Task is Completed:
- Inq.4.f Evaluate and implement strategies for individual and collective action to address problems in and out of school.

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).
Creativity/Innovation Transdisciplinary Goal:

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Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Communication Transdisciplinary Goal:
Students effectively communicate and use interpersonal skills in a range of formal and informal contexts.

Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Culture is constantly changing through interaction, exchange, adaptation, and creativity; cultural exchange is not automatically harmful or automatically positive. • Whether cultural borrowing counts as appreciation, appropriation, or exploitation depends on factors such as context, history, power, intent, impact, and economic benefit — and these categories are not always easy to distinguish. • Good intentions do not automatically eliminate harmful impact, and reasonable people can interpret the same example of cultural borrowing differently. • Cultural borrowing can become exploitative when one group profits from another group's culture while that culture's members are excluded, ignored, or stigmatized. • People and communities can disagree about cultural issues while still using evidence and engaging respectfully.
Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	**Inquiry Arc 1: How Does Culture Move from One Group to Another?** • What is culture, and how does cultural exchange happen? • Why do some cultural practices become popular while others remain overlooked or misunderstood? • How do power, media, and money influence cultural exchange? **Inquiry Arc 2: When Does Cultural Borrowing Become Appreciation, Appropriation, or Exploitation?** • How should we evaluate the difference between appreciation and appropriation? • How can cultural borrowing create economic opportunity or exploitation? • What responsibilities do creators, companies, celebrities, and consumers have?

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What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Culture • Cultural exchange • Cultural appreciation • Cultural appropriation • Cultural exploitation • Representation • Stereotype • Context • Intent • Impact	• Analyze current pop-culture examples for point of view, purpose, and reliability of sources. • Compare intent and impact, and analyze power and economic benefit, in a cultural controversy. • Distinguish among competing interpretations of a controversial issue. • Construct a nuanced, evidence-based argument that acknowledges competing perspectives. • Develop a recommendation for a specific real-world audience.

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal • Create an evidence-based resource that helps a specific audience understand the difference between cultural exchange, appreciation, appropriation, and exploitation. **Role** • You are a Pop Culture and Cultural Issues Advisor. **Audience** • Choose one: a school community, a student government, a youth organization, a media or entertainment company, a social media audience, or a group of young consumers. **Situation** • A current pop-culture controversy has led to disagreement about whether a cultural practice, symbol, style, tradition, or form of expression is being respectfully shared or improperly used. Your audience wants to understand the issue — but not through an oversimplified answer. **Product/Performance/Purpose** • A social media education campaign for the app of your choice: X, Instagram, or TikTok **Standards and Criteria for Success, including VoG Alignment** • Identifies a current or recent pop-culture example and explains the cultural practice, symbol, style, or tradition involved, with relevant historical and cultural context.

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- Analyzes the issue using at least 4 of: intent, impact, context, power, economic benefit, credit, representation.
- Uses at least 3 credible sources and explains at least 2 different perspectives.
- Makes an evidence-based judgment or recommendation — the goal is not simply to assign a label, but to explain and defend a conclusion using evidence and context.
- Avoids treating an entire culture or community as having only one opinion.

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

- Link to directions, rubric, and organizer

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

- Link to directions, rubric, and organizer

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

- Be sure to check the extra information documents and resources in the folder. They can help provide more detail on how these assignments are all connected, and where in each lesson the standards can be found.

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Stage 3: Learning Plan

Overview: This unit unfolds across two IDM inquiry arcs, each with its own compelling question feeding the unit's overarching question, “Who owns culture?” Arc 1 asks how culture moves from one group to another, grounding students in cultural exchange, popularity, and the role of power and media. Arc 2 asks when cultural borrowing becomes appreciation, appropriation, or exploitation, examining intent vs. impact and who benefits economically — culminating in the GRASPS summative task. Because classes meet in 88-minute blocks, each lesson comfortably holds an opening, a core inquiry task, and a closing synthesis; pacing suggestions are noted in the Key Activities column of the lesson table.

Recurring routine: open each class period with a 5–10 minute “Culture Watch” — students bring in and discuss a current pop-culture development using the guiding questions in the appendix. This keeps the unit genuinely connected to Current Issues; select examples carefully and provide enough context that students analyze the issue rather than simply react to a headline.

"Culture Watch” Recurring Routine

Inquiry Arc 1: How Does Culture Move from One Group to Another? (Lessons 1–3)

Compelling Question	Who owns culture when ideas, traditions, and creative expressions move between groups?		
Standards & Practices	D2.His.4.9-12 — Analyze complex and interacting factors that influenced the perspectives of people during different historical eras. | D2.Eco.1.9-12 — Analyze how incentives influence choices that may result in a range of costs and benefits for different groups.		
Staging the Question	“Pop Culture Trend Watch”: students view several current or recent examples of cultural borrowing (music, fashion, hairstyles, food, dance, sports celebrations, social media trends, film/TV, advertising, celebrity culture) and respond to: What cultural element is being used? Where did it come from? Who is using it now? Who appears to benefit? The goal is not to reach a final answer.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	What is culture, and how does cultural exchange happen?	Why do some cultural practices become popular while others remain overlooked or misunderstood?	How do power, media, and money influence cultural exchange?
Formative Performance Task	Complete a Pop Culture Culture Map (cultural element → original/associated community → current use → who benefits →	Concept Sorting: place hypothetical examples (food, music, clothing, hairstyles, dance, symbols, language) on an	Four-Lens Analysis (Culture / Power / Economics / Representation) of a current pop-culture example; short written

	open questions) using a current example students bring in from the news.	exchange–appreciation –appropriation continuum; complete a Cultural Borrowing Analysis Chart addressing intent, impact, credit, and historical context.	response using at least two of context, intent, impact, power, economics, or representation.
Featured Sources	*Curated set of current pop-culture examples with brief context notes; a short reading introducing the unit's key vocabulary*	*Composite/hypothetical examples spanning food, music, clothing, hairstyles, dance, symbols, and language*	*A short case study of a cultural practice or style treated differently depending on who uses it; brief news coverage of a representation debate*
Arc Summative Check	Inquiry Arc 1 Checkpoint: students return to the Arc 1 compelling question and write a preliminary answer, to be revisited at the unit's end.		

Inquiry Arc 2: When Does Cultural Borrowing Become Appreciation, Appropriation, or Exploitation? (Lessons 4–6)

Compelling Question	When does borrowing from another culture become harmful?		
Standards & Practices	D2.Civ.14.9-12 — Analyze historical, contemporary, and emerging means of changing societies, promoting the common good, and protecting rights. | D2.His.1.9-12 — Evaluate how historical events and developments were shaped by unique circumstances of time and place.		
Staging the Question	Opening question: “If someone did not intend to offend anyone, can their action still cause harm?” Students consider examples from advertising, celebrity fashion, film/TV, music videos, social media trends, and school/sports mascots before the inquiry begins.		
	Supporting Q1	**Supporting Q2**	**Supporting Q3**
Supporting Questions	How should we evaluate the difference between appreciation and appropriation?	How can cultural borrowing create economic opportunity or exploitation?	What responsibilities do creators, companies, celebrities, and consumers have?
Formative Performance Task	Intent and Impact Matrix: place current examples into a positive/negative-intent by low/high-impact	“Follow the Money” case analysis identifying who created/maintained a tradition, who	Civic-action research and options chart; launch the GRASPS performance task, form teams, and begin work

	grid; written sentence-frame analysis of one example, supported with evidence.	popularized it, who owns the brand, and who is credited or paid; Who Benefits? Analysis weighing Perspective A (opportunity), B (exploitation), and C (context-dependent).	time using evidence gathered across the unit.
Featured Sources	*Brief case examples of advertising, celebrity fashion, or media portrayals for the intent/impact matrix*	*A "follow the money" case study of a commercially successful cultural product or trend; the three suggested Perspectives (A, B, C) for discussion*	*Student-selected current-event example plus evidence and organizers compiled across Lessons 1–5*
Taking Informed Action (Optional)	**Understand:** Research a current cultural issue in pop culture and investigate its historical and cultural context. **Assess:** Evaluate what different perspectives exist, who is affected, who benefits, what evidence supports each perspective, and what role power and history play. **Act:** Create an educational resource or recommendation for a specific audience — for example, giving credit to cultural creators, consulting cultural communities, avoiding stereotypes, sharing financial benefits, improving representation, educating consumers, or changing company/media practices.		

Lesson-by-Lesson Sequence

Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
1	Arc 1 · Staging + SQ1	I will analyze complex interacting factors that shape how cultural elements move between	I can identify real, current examples of cultural borrowing across music, fashion, dance, and social media.	A. "Pop Culture Trend Watch" staging: examine current examples of cultural borrowing across music, fashion, food, dance, and social media (~20 min)	Completed Pop Culture Culture Map plus exit-ticket response on what's needed before	Culture, Cultural Exchange

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		groups using current real world examples across cultures.	I can explain how new questions emerge from examining varied, current examples, rather than reaching a premature conclusion I can complete a Culture Map tracing a cultural element from its original community to its current use and identifying who appears to benefit. I can identify what additional information I would need before judging whether a specific example is appreciation or appropriation.	B. Current Events Connection: students share a recent example from the news (~15 min) C. complete a Pop Culture Culture Map organizer (~40 min) D. exit ticket (~13 min). Lesson 1: Who_…	judging appreciation vs. appropriation.	
2	Arc 1 · SQ2	I will analyze how power	I can distinguish	A. Concept Sorting: place hypothetical	Completed Cultural	Cultural Appreciation,

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
		dynamics and economic incentives shape whether cultural borrowing is experienced as exchange, appreciation, or appropriation	cultural exchange, cultural appreciation, and cultural appropriation using precise definitions. I can collaborate to place a hypothetical example on a continuum and explain points of genuine disagreement I can construct an explanation using sound reasoning and pertinent details, applying the power/credit/profit lenses to a specific example	examples (food, music, clothing, hairstyles, dance, symbols, language) on an exchange–appreciation–appropriation continuum in small groups (~40 min) B. Key Analysis Questions discussion (power, credit, profit) (~25 min) C. complete Cultural Borrowing Analysis Chart (~23 min). Lesson 2: Who_…	Borrowing Analysis Chart.	Cultural Appropriation
3	Arc 1 · SQ3 + Arc 1 Checkpoint	I will analyze how power, money, and representation influence cultural controversies.	I can explain a well-documented pattern of differential treatment of the same cultural practice.	A. Mini-lesson on differential treatment of the same cultural practice by different groups (~15 min) B. Four-Lens Analysis (Culture / Power / Economics / Representation) of a current pop-culture example (~40 min)	Four-Lens Analysis plus Arc 1 Checkpoint response.	Cultural Exploitation, Representation

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			I can apply all four lenses — Culture, Power, Economics, Representation — to a real, current example I can write a short, evidence-based response using at least two of the four lenses. I can write a preliminary, revisable answer to the unit's Arc 1 compelling question.	C. short written response using at least two factors (~15 min) D. Arc 1 Checkpoint: preliminary written answer to the Arc 1 compelling question (~18 min). Lesson 3: Who_…		
4	Arc 2 · SQ1	I will analyze the relationship between intent and impact in cultural controversies.	I can share my opinion with my classmates and listen respectfully to theirs I can distinguish intent, impact, and context using precise definitions. I can construct an explanation,	A. Opening question: can an unintended action still cause harm? (~10 min) B. Intent and Impact Matrix activity using examples from advertising, celebrity fashion, media, and mascots (~40 min) C. discussion: can positive intent still lead to harmful impact? (~15 min) D. sentence-frame written analysis of a current example (~23 min).	Intent and Impact Matrix plus sentence-frame written analysis, supported with evidence.	Intent, Impact, Context

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			using sound reasoning and pertinent details, placing a real example on an Intent × Impact matrix I can evaluate whether positive or neutral intent can still coexist with high real-world impact. I can write a sentence-frame analysis of a current example, supported with evidence.	Lesson 4: Who_…		
5	Arc 2 · SQ2	I will analyze the economic consequences of cultural borrowing.	I can trace a real cultural practice's economic path from creation to popularization to present-day profit. I can explain points of genuine disagreement between	A. "Follow the Money" case analysis: who created it, who popularized it, who profits, who's credited? (~35 min) B. discussion of Perspectives A (opportunity), B (exploitation), and C (context-dependent) (~30 min) C. Who Benefits? Analysis writing task (~23 min).	Who Benefits? Analysis with evidence-based reasoning.	Stereotype; reinforcement of Cultural Exploitation

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			competing perspectives on economic exploitation I can write a Who Benefits? analysis using evidence-based reasoning.	Lesson 5: Who_…		
6	Arc 2 · SQ3 + Summative	I will construct and communicate an evidence-based argument about a current cultural controversy.	I can demonstrate my knowledge of unit vocab I can select a current, specific cultural controversy and explain its relevant historical and cultural context. I can construct an argument using precise, knowledgeable claims with evidence, acknowledging counterclaims I can organize and prioritize evidence from multiple	A. Vocabulary Quiz B. “Trend Watch” selection of a current controversy, trend, or example (~15 min) C. GRASPS workshop time to build the chosen resource (guide, PSA, podcast, video essay, infographic, article, or campaign) (~50 min) D. share/present resources (~13 min); remaining work and presentations may extend to a following period. Taking Informed Action task assigned. Lesson 6: Who_…	GRASPS cultural-issues resource scored with the unit rubric; Taking Informed Action follow-through.	Applied use of full vocabulary list

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Lesson	Arc / Focus	Learning Target	Success Criteria	Key Activities	Formative Assessment	New Vocab
			credible sources to support my claims I can present my argument to reach a real audience beyond the classroom			

Current Issues Curriculum

SHS Social Studies

Why Current Issues?

A Current Issues course is essential at the high school level because students need more than knowledge of current events—they need the skills to **evaluate information, recognize bias, understand global issues, and participate responsibly in civic life**. Research shows that media-literacy instruction can improve students' ability to evaluate news and increase their political knowledge and civic confidence.[1] Research also finds that positive attitudes toward news and current events are strong predictors of adolescents' intentions to participate in civic life.[2]

1: Sabine Geers, Mark Boukes, and Judith Moeller, "Bridging the Gap? The Impact of a Media Literacy Educational Intervention on News Media Literacy, Political Knowledge, Political Efficacy among Lower-Educated Youth," Journal of Media Literacy Education 12, no. 2 (2020): 41–53.

2: "Learning to Engage: How Positive Attitudes about the News, Media Literacy, and Video Production Contribute to Adolescent Civic Engagement," Educational Media International 50, no. 4 (2013).

Course Overview

The Current Issues course will teach students the importance and value of paying attention to the world around them. Throughout 5 units, students will develop the skills necessary to critically think about current events and issues. They will understand their civic responsibilities and role global citizens.

What makes this course unique is that students have a say in which units are taught. Their Unit 1 Performance Task requires them to convince their classmates and teacher that a specific topic deserves to be one of the three units at the end of the semester. The 3 best arguments will then become the last 3 units of the course.

Mandatory Introductory Units

Unit 1: Why Current Issues?

This is the mandatory opening unit. It will ask students to consider what it means to be a global citizen and the importance of staying informed. Essentially, why study current issues? The semester's final three units are then chosen using arguments that students build in this unit's summative task.

Lesson Topics & Activities Include:

- Civic Knowledge Data Analysis
- Headlines Gallery Walk
- Local-to-Global Case Study
- Argumentative Essay

Unit 2: Decoding the Headlines

This unit examines the fundamentals of today's news and the dangers of fake news and media bias. Over the course of this unit, students will learn about what makes an event truly "newsworthy", the differences and dangers of misinformation and disinformation and how media bias can influence our views on the world and current events. Students will practice identifying the criteria of a news story, the tactics used to spread disinformation and how to spot media bias in the news.

This unit is meant to support media literacy skills used across all disciplines and emphasize real life applications to students.

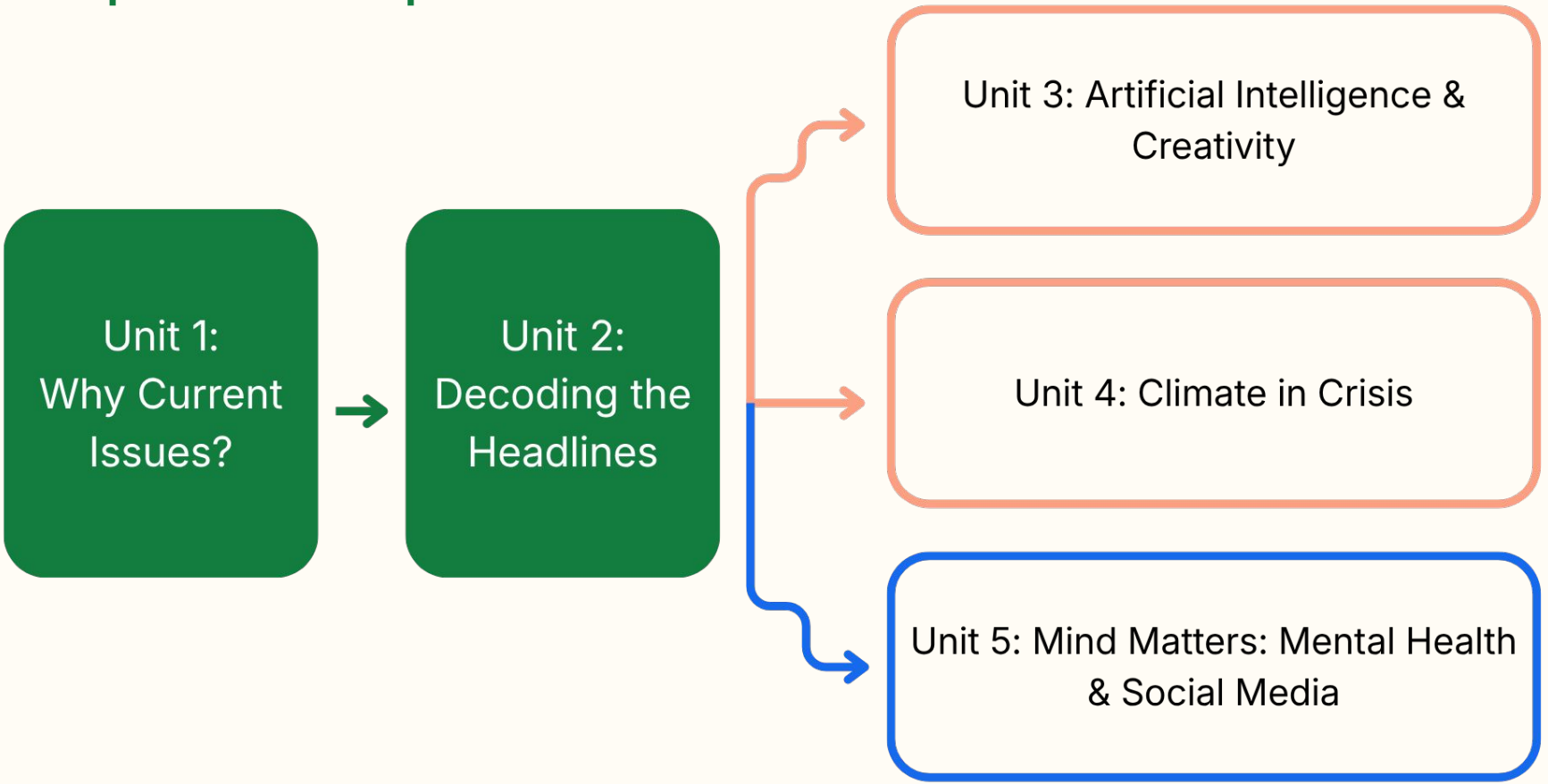
Unit 1:
Why Current Issues?

Unit 2:
Decoding the Headlines

- Artificial Intelligence & Creativity
- Bridging the Gap: Income Inequality in the U.S.
- Climate in Crisis
- Displaced Dreams: Refugees
- Hot Spots: Political Issues of the 21st Century
- Mind Matters: Mental Health & Social Media
- Safeguarding Society: Navigating Public Safety
- The State of Education
- Who Owns Culture?

Each unit connects to other electives at SHS, fostering curiosity of further exploration

Example Semester Experience



Why Current Issues at SHS?

A dedicated course gives students regular opportunities to analyze current events, compare sources, evaluate evidence, discuss complex issues, and connect local events to national and global developments. Rather than telling students **what to think**, Current Issues teaches them **how to think critically** about the information they encounter and how to participate thoughtfully in their communities and the world.

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 10 h.

AGENDA REPORTING FORM

Agenda Topic: SHS History - American Culture -Revised - Second Reading.

Summary of Issue: The Curriculum & Instruction Committee has reviewed the SHS History - American Culture -Revised.

Background: _____

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Move that the Board of Education approve the SHS History - American Culture -Revised– as presented by the Curriculum & Instruction Committee.

Titles of Attachments:

1. Course Proposal

Christine L. Martin

Signature of Staff Member Submitting Report

Steven Madaras

Signature of Superintendent of Schools

Southington Public Schools Curriculum
American Culture

Unit 1 Overview	
Unit Title:	**Unit 1: Prosperity, Conformity, and the American Dream (1950–1962)**
Teacher(s):	**Kurt Armintrout; Charles Kemp**
Grade Level/Course:	**10th - 12th Grade**
Length/Dates:	**11 class sessions (88 minutes each)**
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	**Students examine how postwar prosperity, suburbanization, television, consumer culture, teen popular culture and Cold War anxieties shaped American identity. Students evaluate competing definitions of success and explore who was included—and excluded—from the postwar American Dream.**

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

CT Social Studies Framework:
CG.Civ.5.b. Evaluate the effectiveness of strategies used by an individual, group or institution in addressing a social problem at the local, state, tribal, national, and/or international level (e.g., social protest movements, get-out-the-vote campaigns, conscious consumerism).
US.Eco.13.a Explain why investments in infrastructure and industry expanded consumer culture and increased standards of living in the United States (e.g., housing access, mass production, urbanization, utilities).
US.His.5.b Analyze the role of popular culture, subculture, and counterculture in shaping public perception of national identity during the post-World War II era (e.g., Beat Generation, Rock and Roll, Motown, Jazz, Hippies, television sitcoms, Hollywood films).

Inquiry Standards:
US.Inq.1.a Explain how compelling and supporting questions reflect an enduring issue in United States History.
US.Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums while using the origin, authority, structure, context, and corroborative value to guide the selection of credible sources.
US.Inq.3.b Organize and prioritize evidence directly and substantively from multiple sources in order to develop or strengthen claims.

Common Core State Standards:
CCSS.ELA-Literacy.RH.11-12.3 Evaluate various explanations for actions or events and determine which

explanation best accords with textual evidence.
CCSS.ELA-Literacy.RH.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.
CCSS.ELA-Literacy.WHST.11-12.1.a Write arguments focused on discipline-specific content: Introduce precise, knowledgeable (claims), establish the significance of the claim(s), distinguish the claim(s), from an alternate or opposing claims, and create an argument that logically sequences the claim(s), counter-claims, reasons and evidence.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

- Reading comprehension
- Reading maps & charts
- Primary Source work (reading & understanding, sourcing, writing a claim)
- Analyzing multimedia sources
- Inquiry

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.
Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.
Citizenship Transdisciplinary Goal
Students demonstrate an empathetic understanding of social issues and value different perspectives so that they can contribute to local and global communities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	1. American identity is shaped by historical events, shared values, and cultural institutions, but different groups experience that identity in different ways. 2. The American Dream reflects changing cultural values and is influenced by economic opportunity, social expectations, and access to resources, although the American Dream has never been equally available to all Americans. 3. Consumer culture in America influences how individuals express identity, define success, and measure social status. 4. Popular culture both reflects and reinforces societal beliefs about race, gender, and belonging. 5. Americans continually balance individual freedom with social responsibility. 6. Cultural change often begins when individuals or groups challenge existing norms and institutions.
Essential Question(s):	1. What does it mean to be an American? 2. Who has access to the American Dream? 3. How does consumer culture shape identity?

Southington Public Schools Curriculum
American Culture

These questions are related to the enduring understandings and provide relevance for the learning in the unit.	4. How have representations of racial and ethnic groups in American popular culture changed over time, and what do those representations reveal about belonging and power? 5. When should Americans challenge the status quo? 6. What values defined America?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• American Dream: competing definitions of success, security, mobility, and belonging • Consumerism and materialism: postwar purchasing power, advertising, status, and identity • Suburbanization and the Baby Boom: housing growth, family ideals, infrastructure, and unequal access • Conformity and the nuclear-family ideal: gender roles, social expectations, and pressures to belong • Mass media and television culture: creation of shared narratives and reinforcement of social norms • Teen culture and rock and roll: youth purchasing power, racial/cultural exchange, and generational change • Civil Rights Movement: segregation, integration, early direct action, and challenges to unequal access **Vocabulary** • American Dream • Consumerism • Materialism • Conformity • Suburbanization • Baby Boom • Cold War • McCarthyism • Red Scare • Mass Media • Television Culture	• Analyze primary and secondary historical and cultural sources for context, perspective, purpose, and evidence. • Gather and evaluate relevant information from multiple text, visual, audio, and multimedia sources, considering origin, authority, context, and corroboration. • Organize and prioritize evidence from multiple sources to develop and strengthen a claim. • Interpret and analyze data from maps, charts, graphs, and demographic evidence. • Evaluate multiple historical and cultural perspectives, including perspectives that complicate dominant narratives. • Construct evidence-based historical and cultural arguments that acknowledge tension, exclusion, and counterevidence. • Identify continuity and change in cultural values. • Analyze how media (advertisements, television, film, music) both reflected and reinforced public attitudes and social norms. • Evaluate the effectiveness of strategies used by individuals and groups to challenge social problems and cultural norms.

• Civil Rights Movement • Segregation • Integration • Nuclear Family • Beat Generation • Rock and Roll	

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence
What will the student produce? Use the GRASPS model below to design your performance task.

Goal
- To develop a multimedia presentation that consists of a strong claim supported by historical evidence.

Role
- A student creating a special exhibit for the Museum at Bethel Woods, an institution dedicated to arts and culture in America during the middle of the twentieth century

Audience
- Visitors to the digital special exhibits of the Museum of Bethel Woods seeking to learn about mid-20th century American culture.

Situation
- You have been chosen by the museum to create a digital presentation that explores the concept of the American Dream and societal beliefs reflected in the media in the 1950s.

Product/Performance/Purpose
- The final product should be a well-developed and well-supported Google Slides presentation that examines multiple modes of media that portrays mid-20th century American culture

Standards and Criteria for Success, including VoG Alignment
- Students formulate a cultural argument about societal beliefs and the concept of the American Dream in the 1950s. The Performance Task rubric incorporates strands from the district Critical Thinking rubric (VoG).

Resources
Any materials and resources related to the performance task that the teacher or student would need to be successful.

Unit 1 Performance Task

Evaluative Criteria
How will you evaluate this task? How will you provide feedback to students?

Rubric in Performance Task

Comments
Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

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In this 11-day unit, students examine how the years 1950-1962 reshaped American culture and identity. They'll investigate postwar prosperity, suburbanization, television, consumer culture, teen popular culture, and Cold War anxieties—not as isolated topics, but as interconnected forces that created competing visions of the "American Dream." Most importantly, students will grapple with the central question: Who was included in this dream, and who was left out? This unit bridges World War II and the social upheavals of the 1960s.
Essential Background Knowledge for Teachers for this unit include: World War II's End and Postwar Transition (1945-1947), Economic Boom Factors, Cold War Origins and Domestic Impact, Key Legislation and Policies (1950-1962), and major world events (1950-1962).

Stage 3: Instructional Design

Design EACH learning task for the unit. Copy and paste additional tables below to outline all lessons within the unit.

Learning Target:	**Success Criteria:**
• I will define American culture and explain how shared values shape competing ideas of the American Dream.	• I can identify at least three values commonly associated with American culture and support them with evidence from course readings/discussion. • I can compare how at least two groups might experience or prioritize those values differently. • I can revise my initial definition of American culture and explain how it connects to the American Dream.

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 1: What is American Culture?

- Opener to introduce the unit
  - Students are asked to brainstorm in groups a definition of American culture. Share-out to class. During discussion, the teacher transitions by introducing the “American Dream.”
- American Dream Activity
  - Students are asked to draw their idea(s) of the American Dream. Share within groups when finished.
  - Students read and annotate articles about American culture and values from a Boston University resource and an article given to exchange students to introduce them to American Culture. Students should compare their own definitions of American Culture to what was presented in the articles and note similarities and differences. They should note how their drawing of the American Dream represents ideas of cultural values noted in the articles.
- Wrap-Up - Revising definition and debrief

- Students will work together in their group to finalize a definition of American Culture. They should discuss whether they believe those values have remained constant over time and how different values are perceived by various groups (age/sex/race/socioeconomic classes) within America

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Exit Ticket: Identify one American cultural value that strongly shapes the American Dream. Explain, using evidence, how that value might be experienced differently by two groups of Americans.

Learning Target:	**Success Criteria:**
• I will describe major political, economic, and social developments of the 1950s and explain how they created both prosperity and unequal experiences of the American Dream.	• I can accurately describe at least three major developments in 1950s America. • I can interpret evidence from a reading, map/chart, or demographic data set. • I can use evidence to answer the questions: 'Contentment for whom?' and 'Consensus among whom?' • I can distinguish a broad national trend from the experiences of groups who did not share equally in it.

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 2: America in the 1950s

- Students will learn about the transformation of America in the 1950s. Topics include the impacts of the Cold War, economic and social changes, civil rights, and gender norms.
- Intro: Play Decade of Booms Video. Think-Pair-Share: What did you recognize/have background knowledge about? What stood out?
- Activity
  - Students use the Building Blocks sheet to annotate and read the 1950s article. When completed, students discuss in groups and answer questions at the bottom of the article.
  - *Optional*: teacher can divide students and assign categories (Gender Roles, Civil Rights, Suburbanization, Economic Growth, Foreign Relations, etc.) for a group mini-research assignment beyond the article. Groups create a slide and present it to class.
- Wrap Up: Students look at Norman Rockwell's paintings of Roosevelt's Four Freedoms and make an updated 1950s version based on the values and historical developments they have learned about.

Assessment
List any formative or summative assessments that should be administered within this learning sequence.

(They can be listed/linked below)

• Possible formative assessments
  ○ Exit ticket
  ○ Building Blocks summary

Learning Target:	**Success Criteria:**
• I will analyze how 1950s television both reflected existing social ideals and reinforced shared norms about family, gender, consumption, race, and belonging.	• I can identify plot elements of a sitcom episode • I can explain how television programming reflected and reinforced social norms in the 1950s

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 3: Television Spreads the Monoculture

- Teacher introduces the concept of a sitcom and the format's role in helping to make TV ubiquitous in America
- Students will be introduced to the formula used in sitcoms
- Watch an episode of *Father Knows Best* ("The Christmas Story") as guided practice for identifying plot elements and discussing the portrayal of American Culture (post-war consumerism, nuclear family dynamics, suburbanization, traditional gender roles).
  - Optional activity: American Culture in 1950s commercials (note: teacher will need to show commercials individually or upload Youtube videos to Canvas)
- Performance Assessment: Father Knows Best and 1950s Culture

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Performance Assessment: making cultural connections in 1950s media

Learning Target:	**Success Criteria:**

• I will explain why rock and roll emerged as a major cultural force in the 1950s by analyzing its musical roots, youth consumer culture, racial exchange, media, and social change.	• I can identify elements of traditional American music genres (Country, Blues, Jazz, Gospel) within rock and roll music • I can gather and corroborate evidence from primary and secondary sources about rock's emergence. • I can explain at least two social/economic conditions that helped rock spread. • I can analyze the role of teenagers, radio/records, and racial/cultural exchange in making rock a cultural force. • I can organize evidence to support a defensible causal claim.

Learning Activities

What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 4: The Emergence of Rock

In this lesson, students explore the roots of rock and roll as an amalgamation of traditional American musical genres.

- Opener: students should write a theory on why they believe rock emerged and spread throughout the 1950s.
- Activity: The Emergence of Rock
  - Students are introduced to Country, Blues, Jazz, and Gospel music and the elements of each genre used in Rock and Roll. Students identify an element from each genre in the first rock song, “Rocket 88.” Revise original theory.
  - DBQ analysis on origins of Rock (documents and accompanying analysis questions) developed from lessons at teachrock.org.

Assessment

List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- CAST paragraph on why rock emerged and spread using evidence from the source set to support the claim.

Learning Target:	**Success Criteria:**

• I will evaluate how demands for conformity limited freedom in the 1950s and how individuals and groups challenged unequal or restrictive social norms.	• I can explain how Cold War anxieties affected daily life and civil liberties. • I can evaluate how pressure to conform affected different groups, including political dissenters, immigrants, LGBTQ+ Americans, and people of color. • I can analyze at least one early Civil Rights Movement strategy (legal challenge, boycott, sit-in, direct action, or organizing) and evaluate its effectiveness in addressing a social problem. • I can compare a later cultural interpretation of the 1950s with primary-source evidence from the period and identify where the interpretation is supported, simplified, or challenged.

Learning Activities

What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 5: Tensions Rise

- Students examine how Cold War anxieties and the push for conformity impacted society and were challenged in the 1950s.
    - Optional Activities: Teacher guided review or PBS reading. Students debrief by being asked what type of society is created by an environment where people are told to be paranoid and suspicious by "outsiders" or people who go against the status quo.
    - Challenging the Status Quo Jigsaw: students investigate an early Civil Rights Movement action such as the Montgomery Bus Boycott, Little Rock integration, sit-ins, or Freedom Rides. Students identify the social problem, strategy used, risks/costs, response, and evidence of effectiveness.
    - Students watch the film *Pleasantville* to analyze its depiction of romanticized 1950s culture and its depiction of Cold War-era anxieties and prejudices by comparing the film to previous learning and 1950s primary sources.

Assessment

List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Socratic Seminar following *Pleasantville* to debrief film viewing and for students to show an understanding of unit topics.
- Socratic Seminar Rubric

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Resources

Any materials and resources related to Stage 3 learning activities.

- Canvas materials
- Youtube videos
- *Pleasantville*
- *Father Knows Best* full episodes
- Clips from ‘50s television shows

Southington Public Schools Curriculum
American Culture

Unit 2 Overview	
Unit Title:	**Unit 2: Rights, Resistance, and Cultural Revolution (1963–1979)**
Teacher(s):	**Kurt Armintrout; Charles Kemp**
Grade Level/Course:	**10th - 12th Grade**
Length/Dates:	**11 class sessions (88 minutes each)**
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	**This unit examines how diverse groups of Americans mobilized to demand civil rights, challenge unjust wars, reimagine cultural norms, and hold political leaders accountable. From the March on Washington to the fall of Saigon, students will explore how grassroots activism reshaped American society and created lasting changes in law, culture, and national consciousness. Through this unit, students will develop critical thinking skills about social movements, evaluate the effectiveness of different protest strategies, and consider the ongoing legacy of this revolutionary period.**

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

CT Social Studies Framework:

US.His.1.h. Evaluate how popular culture in the 1970s and 1980s promoted and reflected hyperconsumerism, racial tension, women's empowerment, and the Cold War.

US.Civ.5.c. Analyze the role of legislative and judicial decisions in expanding or limiting civil liberties (e.g., Hernandez v. Texas, Executive Order 10450, Loving v. Virginia, Civil Rights Act of 1964, Voting Rights Act of 1965, Title IX of the Education Amendments Act of 1972, Roe v. Wade).

US.His.11.a. Determine the usefulness of historical sources to support an inquiry about the causes, escalation, and public reaction to the Vietnam War based on their maker, origin, intended audience, and purpose (e.g., art, ephemera, film, government reports, media, music).

US.His.15.a. Identify both long term causes and triggering events to develop historical arguments about efforts to abolish legalized racial segregation, discrimination, and disenfranchisement (e.g., Southern Christian Leadership Conference, Black Panther Party, Student Nonviolent Coordinating Committee, American Jewish Congress, American Indian Movement, United Farm Workers, Congress of Racial Equality).

Inquiry Standards:

US.Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums while using the origin, authority, structure, context, and corroborative value to guide the selection of credible sources.

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US.Inq.3.b Organize and prioritize evidence directly and substantively from multiple sources in order to develop or strengthen claims.
US.Inq.4.f Evaluate and implement strategies for individual and collective action to address national problems in classrooms, schools, and out-of-school civic contexts.

Common Core State Standards:
CCSS.ELA-Literacy.RH.11-12.3 Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence.
CCSS.ELA-Literacy.RH.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

- Reading comprehension
- Primary Source work (reading & understanding, sourcing, writing a claim)
- Analyzing multimedia sources
- Identify continuity and change
- Construct evidence-based historical arguments

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).
Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Social change occurs when people challenge established beliefs, institutions, and power structures, often through both organized movements and cultural expression. • Power shapes whose identities, rights, experiences, and perspectives are recognized, while marginalized people can redefine public understandings of belonging and citizenship. • Resistance takes many forms, including legal action, protest, art, music, community organizing, alternative lifestyles, and demands for institutional accountability. • Democracy depends on informed participation, the protection of dissent, access to trustworthy information, and institutions that are accountable to the people. • Movements for justice can share strategies and inspiration while maintaining distinct goals rooted in the experiences and needs of particular communities.

	• Cultural transformation changes how people understand identity, freedom, equality, authority, and responsibility, but change is uneven and often produces conflict. • Historical progress is not inevitable; rights and democratic gains must be defended, expanded, and evaluated in light of continuing inequality and new challenges.

Essential Question(s): These questions are related to the enduring understandings and provide relevance for the learning in the unit.	• What does it mean to be an American? • Who has access to the American Dream? • How does consumer culture shape identity? • How have representations of racial and ethnic groups in American popular culture changed over time, and what do those representations reveal about belonging and power? • When should Americans challenge the status quo? • What values defined America?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• Civil Rights Movement strategies and developments, including nonviolent direct action, boycotts, sit-ins, marches, grassroots organizing, civil disobedience, litigation, voter-registration campaigns, Black Power, and community organizing. • How the Civil Rights Movement influenced and intersected with other movements, including women's liberation, LGBTQ+ liberation, the American Indian Movement, Latino/Chicano activism, and antiwar activism. • The causes, escalation, and cultural consequences of the Vietnam War, including the draft, credibility gap, antiwar movement, generational conflict, media coverage, Kent State, and the fall of Saigon. • The characteristics and values of 1960s counterculture, including challenges to conventional attitudes toward authority, sexuality, drugs, materialism, family, community, war, and individual freedom. • How music and popular culture became vehicles for cultural expression and	• Analyze primary sources across multiple media, including speeches, photographs, television, music, advertisements, journalism, documentary footage, and political documents. • Identify continuity and change across the 1960s and 1970s, particularly in attitudes toward race, gender, authority, war, consumerism, identity, and the American Dream. • Compare perspectives within and between social movements to identify shared goals, disagreements, and differing definitions of freedom and equality. • Analyze cause-and-effect relationships between historical conditions, social movements, cultural expression, and changes in American attitudes. • Evaluate the effectiveness and limitations of different strategies used by individuals and groups seeking political, social, or cultural change. • Analyze how popular culture can both challenge and reinforce dominant American values and social norms. • Construct and communicate evidence-based interpretations through discussion, writing,

protest, particularly through rock, folk, psychedelic music, festivals, underground media, and later hip-hop.
- The social and economic conditions surrounding the emergence of hip-hop in 1970s New York, including urban disinvestment, white flight, inequality, and the cultural creativity of Black and Latino communities.
- How 1970s television increasingly addressed controversial social issues involving race, class, gender, poverty, family, prejudice, and political disagreement.
- How Vietnam, Watergate, economic instability, and social conflict contributed to a broader "crisis of confidence" in American institutions during the 1970s.
- How Americans between 1963 and 1979 challenged competing definitions of freedom, equality, citizenship, the American Dream, and American identity.

Vocabulary:

- Boycott
- Sit-in
- Grassroots organizing
- Civil disobedience
- Nonviolent resistance
- Integration
- Segregation
- Black Power
- Black nationalism
- Gulf of Tonkin Incident
- Voting rights
- Escalation
- Draft
- Fall of Saigon
- Conscientious objector
- Credibility gap
- Counterculture
- Kent State Shooting
- Hippie
- Psychedelic
- Commune
- Sexual revolution

multimedia analysis, research, and the podcast performance task
- Connect past to present and use historical context to identify continuities and changes

• Underground press • Feminism • Self-determination • Sovereignty • LGBTQ+ liberation • Watergate • Impeachment • Executive privilege • Investigative journalism • Political accountability	

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence
What will the student produce? Use the GRASPS model below to design your performance task.

Goal
- To produce a new episode of the podcast series American Stories for NPR.

Role
- You are a cultural historian specializing in the 1960s and 1970s.

Audience
- Your audience will be the program's fans and people wanting to learn more about a specific event/topic from the 1960s or 1970s and how it impacted American Culture.

Situation
- NPR is producing a special series called *American Stories*, exploring how ordinary people experienced the cultural revolutions of the 1960s and 1970s. You and your group have been assigned to produce a 10-15 minute episode examining one event, movement, or cultural development through an interview-based narrative.

Product/Performance/Purpose
- Your group will share your findings through interviews with the host. Your answers should provide adequate detail and information in order to educate and inform the audience. During the episode, each group member will take one of the following roles:

- Host
- Historical expert
- Historical figure (real or composite)
- Optional witness or second interviewee

Standards and Criteria for Success, including VoG Alignment

Students will submit:
- your research page *(this document)*
- works cited (MLA format)

  - Transcript of podcast
  - Final recording
- Provide significant information & detail

Specific Rubric and expectations aligned to VoG C Rubrics included in the document below.

Resources

Any materials and resources related to the performance task that the teacher or student would need to be successful.

Unit 2 Performance Task

Evaluative Criteria

How will you evaluate this task? How will you provide feedback to students?

Rubric in Performance Task document

Comments

Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

This unit is organized around five topics across 11 classes of 88 minutes each. Begin with postwar conformity and early cultural dissent, then build toward the Civil Rights Movement, counterculture and subculture, broader movements in a transitioning America, and the 1970s crisis of confidence. Make the connections explicit: early challenges to conformity help frame later movements, Civil Rights strategies and debates influence other justice movements, and the Vietnam War, Watergate, and economic crises raise questions about trust, citizenship, and institutional power.

Because the unit includes civil rights struggles, protest, violence, discrimination, war, and political scandal, establish discussion norms that protect dignity while allowing disagreement. Preview difficult sources, provide historical context, avoid presenting traumatic experiences as spectacle, and center the voices and agency of people who participated in the movements. Use primary sources, brief multimedia selections, structured discussion, and student choice to balance breadth with depth; a source set, jigsaw, seminar, or evidence-based quick write can make each class purposeful. Invite students to question sources and interpretations rather than treating any single account as complete.

For differentiation, offer audio or visual versions of texts, vocabulary support, chunked sources, guiding questions, and multiple options for demonstrating learning; extend learning through independent research, local-history connections, or comparisons with contemporary movements. Use formative checks such as entrance questions, source annotations, discussion trackers, and claim-evidence-reasoning responses, then assess the unit with a research-based argument, comparative essay, presentation, or portfolio aligned to the learning targets. Given the time constraints, prioritize a few representative sources and recurring analytical routines over exhaustive coverage, while reserving time for synthesis across topics.

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Stage 3: Instructional Design

Design EACH learning task for the unit. Copy and paste additional tables below to outline all lessons within the unit.	
Learning Target:	**Success Criteria:**
• I will analyze how political events, social movements, demographic changes, and popular culture challenged established American values and institutions during the 1960s.	• I can research a significant event, movement, or cultural development using credible sources. • I can identify its causes, goals, participants, and cultural significance. • I can explain what established belief, institution, or social norm it challenged. • I can present relevant evidence clearly to classmates. • I can use evidence from peer presentations to identify at least two patterns of social or cultural change across the decade.
Learning Activities What is the actual instructional task that supports student learning in this lesson? Tasks can be linked in here. Include technology integration as applicable to support learning.	

• Unit Intro Brainstorm: Students build a class word cloud on what they know/remember from their Modern US History class about the 1960s. Teacher can do small groups or whole-class marker tag on the whiteboard or use Padlet.
• 1960s Group Mini-Research Presentation
  ○ Teacher assigns groups one of the categories on a 1960s topic/development in the 1960s Movements and Events document. Groups collaborate to complete a mini research activity and present their slides.
  ○ Students use the presentations of peers to complete the other boxes of their organizer.
  ■ Optional: This activity can be completed as a digital gallery walk	

Assessment List any formative or summative assessments that should be administered within this learning sequence. *(They can be listed/linked below)*	
• Formative Assessment: Upon completion of presentations, students independently respond to the question at the bottom of 1960s Movements and Events using evidence from their organizer.	

Learning Target:	**Success Criteria:**
• I will analyze 1960s music as a primary source to explain how musicians reflected or challenged contemporary American values, conflicts, and social movements.	• I can analyze lyrics, tone, audience, and historical context using the song-analysis protocol.

	• I can connect specific musical or lyrical evidence to a historical event, movement, or cultural development. • I can explain the artist's perspective or message. • I can determine whether the song primarily reflects, reinforces, or challenges dominant cultural values. • I can draw a visual representation of a musician's perspective about an issue from the 1960s

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

- Teacher introduces Song Analysis protocol, playing examples of specific musical elements from different genres and eras of music. Students are led in guided practice analyzing a song as a whole class.
- Students are assigned Exploring 1960s Rock
    - Part 1: students read an article and respond to guiding questions
    - Part 2: students explore a playlist of 1960s rock and answer guiding questions (note: these videos will need to be uploaded from Youtube to teacher's Canvas a students do not have Youtube access).
    - Part 3: Students choose one of the songs to analyze with the protocol and then draw a visual representation of the songs message.

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Exit ticket: Students reflect on how the song they chose shows the influence(s) of 1960s culture.
- 1960s Quiz

Learning Target:	**Success Criteria:**
• I will evaluate how the counterculture challenged dominant American beliefs about authority, war, consumerism, community, sexuality, and individual freedom.	• I can identify major beliefs and practices associated with 1960s counterculture. • I can gather evidence from documentary footage, readings, music, and other sources. • I can compare countercultural values with dominant/status quo cultural expectations. • I can use evidence to explain how Woodstock symbolized both the possibilities and tensions of the counterculture.

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

- Bell Ringer: Question Formulation Technique with Ang Lee quote QFocus: “Over the years Woodstock got glorified and romanticised and became the event that symbolised Utopia. It's the last page of our collective memory of the age of innocence. Then things turned ugly and would never be the same again.”
- Activity: Woodstock and Counterculture Analysis
    - PBS Frontline Woodstock Doc clips
    - Links within Woodstock Assignment
    - Resources regarding counterculture developments for students to explore:
        - The Sexual Revolution
        - Drug Culture
        - Counterculture
        - Anti-war/Protesting
- Wrap-up: In groups, students create a Venn Diagram about the American Dream/American identity comparing the “status quo” beliefs of the 1960s and counterculture beliefs.

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Synthesis Question in Woodstock Assignment
- Venn Diagram

Learning Target:	**Success Criteria:**
• I will analyze how social and economic conditions in 1970s New York contributed to the emergence of hip-hop as a form of cultural expression and community identity.	• I can explain how urban disinvestment, white flight, economic inequality, and demographic change affected communities in the Bronx. • I can identify foundational elements of hip-hop culture. • I can analyze a rap song as evidence of the conditions and perspectives of urban communities. • I can explain how hip-hop created a new form of cultural expression for communities often underrepresented in mainstream media.

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

- Students will complete teachrock.org’s Roots of Hip Hop lesson.
    - Starter: Making observations about 1970s Bronx, New York.
    - Lesson Source analysis collaboration
        - teacher guide on website linked above

- Student analysis worksheet

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Students write a new verse for the song "The Message" that captures an element/event of 1970s urban conditions learned in the lesson. Students write an exit ticket explaining their verse and reflecting on the essential question of "Who has access to the American Dream?"

Learning Target:	**Success Criteria:**
• I will analyze how 1970s television used realism and social commentary to represent changing attitudes toward race, class, gender, family, poverty, and American identity.	• I can identify real social issues represented in selected Norman Lear programs. • I can distinguish between television escapism and social realism using specific examples. • I can analyze how television both reflected and influenced debates about American values. • I can evaluate whose experiences were represented and how those representations affected ideas about belonging and power. • I can connect 1970s television to the broader American "crisis of confidence."

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

- Students will continue to examine how domestic and foreign issues continued to put economic and social pressures on ordinary Americans in the 1970s that would lead to divisions within society and a "crisis of confidence," ultimately leading to the resurgence of conservatism and the Reagan Revolution in the next unit. They will examine how the debate and discussion of issues like race, war, poverty, prejudice, opportunity, and liberty were brought to Americans' living rooms via a new wave of realist television, eschewing the escapism that became prevalent in 1960s programming.
  - Optional Resources: *All in the Family/Brady Bunch* comparison
  - *Good Times* analysis
  - Analyzing "Those Were the Days" and "Good Times" lyrics to understand show premises and reflection of 1970s issues/debates
  - 1970s Hot Button Issues on TV research performance assessment
  - Representation in Media article and questions
  - 1960s Changes in American Families
  - Group activity: Build Your Own Sitcom

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- All in the Family Sitcom Analysis Sheet
- Unit 2 Performance Task

Resources

Any materials and resources related to Stage 3 learning activities.

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Unit 3 Overview	
Unit Title:	**Unit 3: Culture Wars, Consumerism, and Media Expansion (1980 – Mid 2001)**
Teacher(s):	**Charles Kemp; Kurt Armintrout**
Grade Level/Course:	**10th - 12th Grade**
Length/Dates:	**11 class sessions (88 minutes each)**
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	**The period from 1980 to 2001 in American Culture represents one of the most transformative eras in modern American history, marked by profound cultural, political, and technological shifts that continue to shape contemporary society. This unit explores the convergence of conservative political resurgence, intensifying debates over American values and identity, explosive growth in consumer culture, and revolutionary changes in both media and communication technology.**

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

CT Social Studies Framework:
US.His.2.a. Analyze how innovations in the application of technology contributed to cultural and political diffusion (e.g., televangelism, Music Television, personal computing, Hip Hop music, cable television, political talk radio).
US.His.1.g. Evaluate whether the conservative ascendency of the 1980s was a reaction to social and economic change and to what extent it was consistent with broader historical trends (e.g., New Right, Watergate, energy crisis, Reaganomics).
US.Civ.13.b. Evaluate United States policies to address public safety in terms of intended and unintended outcomes, and related consequences (e.g., War on Drugs, “America Responds to AIDS” public information campaign, Immigration Reform and Control Act).

Inquiry Standards:
US.Inq.1.a Explain how compelling and supporting questions reflect an enduring issue in United States History.
US.Inq.4.b. Construct explanations using sound reasoning, correct sequence, relevant examples, and pertinent details to contextualize evidence and arguments (e.g., chronology, causation, procedure).
US.Inq.3.b Organize and prioritize evidence directly and substantively from multiple sources in order to develop or strengthen claims.

Common Core State Standards:
CCSS.ELA-Literacy.RH.11-12.7 Integrate and evaluate multiple sources of information presented in

diverse formats and media in order to address a question or solve a problem.
CCSS.ELA-Literacy.RH.11-12.2 Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.
CCSS.ELA-Literacy.RH.11-12.9 Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

- Analyzing multimedia sources
- comparing multiple sources
- Identify continuity and change
- Construct evidence-based historical arguments

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).
Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Economic Ideologies Shape Social Values and Cultural Identity • Technological Innovation Fundamentally Transforms Human Connection and Information Access • Cultural Conflicts Reflect Deeper Tensions About National Identity and Belonging • Media Shapes—and is Shaped by—Political and Cultural Power • Globalization Creates Interconnected Opportunities and Inequalities • Consumer Culture Reflects and Reinforces Values About Identity and Aspiration
Essential Question(s): These questions are related to the enduring understandings and	• Who has access to the American Dream? • How does consumer culture shape identity? • How have representations of racial and ethnic groups in American popular culture changed over time, and what do those representations reveal about belonging and power? • What values defined America?

provide relevance for the learning in the unit.	

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• The Reagan Revolution was a conservative response to the economic and social upheavals of the 1960s–1970s, including supply-side economics, tax reduction, deregulation, reduced emphasis on some federal social programs, and renewed emphasis on individualism, entrepreneurship, family, religion, and traditional values. • How Reagan-era economic ideas and the celebration of wealth shaped consumerism, yuppie culture, status consumption, gender expectations, ideas about success, and debates over the American Dream. • The rise of the New Right/Religious Right and culture-war debates over family, sexuality, race, poverty, authority, equality, and the role of government. • The War on Drugs and mass incarceration as public-safety policies with intended and unintended social consequences, including racial disparities and competing debates about crime, justice, and equality • How television and popular media represented Black Americans and other identity groups differently across the 1970s–1990s, including debates about representation, respectability, stereotypes, belonging, and power. • Major racial and cultural conflicts of the 1990s, including Rodney King and the Los Angeles uprising, and how news media and popular culture shaped public understanding of race and policing. • How hip-hop, gangsta rap, conscious rap, grunge, and other youth subcultures reflected experiences of inequality,	• Gather and evaluate information from primary and secondary sources, considering origin, author/creator, purpose, audience, context, evidence, and perspective or bias. • Organize and prioritize evidence from multiple sources to develop or strengthen claims. • Construct explanations using sound reasoning, chronology, causation, relevant examples, and pertinent details. • Trace connections between technological innovation and changes in social behavior, political engagement, and cultural production • Identify continuity and change in American culture from 1980–2001, especially in consumerism, race and representation, identity, media, and the American Dream. • Situate specific events within broader economic, political, and cultural contexts • Interpret political speeches, advertisements, music lyrics, film, television content, and early internet materials as historical evidence • Explain why the 1980s-1990s are remembered differently by different communities • Evaluate the role of social movements, activists, artists, and entrepreneurs in shaping historical change • Analyze music, film, fashion, advertising, and consumer products as reflections of cultural values and anxieties

alienation, identity, resistance, and generational change. • How MTV, cable television and news, advertising, and celebrity culture transformed media consumption. • How personal computers, the World Wide Web, early online services, and the dot-com boom changed communication, commerce, work, information access, and ideas about wealth and opportunity. • How globalization expanded economic and cultural connections while creating new opportunities, anxieties, and inequalities by the turn of the millennium. Vocabulary: • Reaganomics • Supply-side economics • Culture Wars • Religious Right • Moral Majority • Consumerism • Generation X • Yuppie • Hip Hop • Grunge • Brat Pack • Infotainment • Music video • Multiculturalism • Identity politics • AIDS crisis • Dot-com boom • Globalization • MTV (Music Television) • War on Drugs • Personal Computer (PC) • Neoconservatism • World Wide Web (WWW) • Corporate Raider	

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence
What will the student produce? Use the GRASPS model below to design your performance task.

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Goal
Your goal is to analyze and evaluate how teen culture, identity, and experiences have evolved over four decades by comparing the portrayal of teenagers in 1980s John Hughes films with the reality of teen life in the 2020s. You will identify what has changed, what has remained constant, and what cultural forces have shaped each generation's unique teenage experience.

Role
You are a cultural critic and social historian who specializes in youth culture and media representation. You have been commissioned to write an analytical essay that explores generational shifts in teen identity, social dynamics, and cultural context.

Audience
Your audience includes:
• Fellow students who want to understand their own generation in historical context
• Teachers and school administrators interested in understanding teen culture across generations
• Parents and community members who were teenagers in the 1980s
• A general readership interested in cultural history and media studies

Situation
A cultural magazine is publishing a special issue titled "Teen Identity Across the Decades" and has invited student voices to contribute. The publication recognizes that today's teens have a unique perspective on how their experiences compare to previous generations, particularly as portrayed in iconic 1980s films. You must balance academic analysis with personal insight, using both research and the John Hughes films you've studied in class. Your challenge is to move beyond surface-level comparisons and explore the deeper social, economic, political, and technological forces that shape teen identity in each era.

Product/Performance/Purpose

Product: You will create a 5+ paragraph essay comparative analytical essay that examines teen culture in the 1980s and 2020s through five required lenses:
Cultural Context
Character Stereotypes
Themes
Media Influence
Impact of Technology

Performance: You will demonstrate your learning and skills through research, analysis, synthesis, clear writing, accurate citation of sources, and presentation of evidence-based arguments.

Purpose: This work matters because it helps you understand cultural evolution, develop critical media literacy, connect personal experience to historical context, and contribute meaningful analysis to public discourse about generational identity.

Your essay must include:
- A clear thesis statement
- Specific examples from at least two John Hughes films *(Sixteen Candles, Breakfast Club, Weird Science, Pretty in Pink, Ferris Bueller's Day Off, Some Kind of Wonderful)*
- Reference to notes compiled from 3 half hour in-class film excerpt screening sessions
- Internet research on 1980s social, political, and economic factors
- Multiple images for the magazine publication

- 3-5 credible sources properly cited

Standards and Criteria for Success, including VoG Alignment

Listed in the rubric

Resources

Any materials and resources related to the performance task that the teacher or student would need to be successful.

Unit 3 Performance Task: John Hughes Movie notes ORGANIZER

UNIT 3 Performance Task: John Hughes Films and 2020s Teens ESSAY

Evaluative Criteria

How will you evaluate this task? How will you provide feedback to students?

Unit 3 Performance Task RUBRIC

Comments

Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.

This unit examines a transformative period when America shifted from Cold War anxieties to digital-age optimism, all while grappling with deep divisions over cultural values. The 1980s ushered in the Reagan Revolution—a conservative political realignment that championed deregulation, tax cuts, and traditional values while fostering a culture that celebrated wealth and entrepreneurship. Start with the big picture—help students see these decades as a hinge point between the 20th and 21st centuries. Use storytelling to make abstract concepts concrete: the rise and fall of a savings-and-loan bank, a day in the life of an early AOL user, the journey of a 1980s immigrant family. Don't shy away from controversy, but model how historians analyze competing narratives with evidence and empathy. Finally, leverage students' curiosity about technology—most are fascinated by how different life was without smartphones—and use that as a bridge to deeper questions about power, inequality, and change. This unit offers incredible opportunities to connect past and present in ways students find immediately relevant.

It should be noted to educators that this unit (and course) introduces controversial topics and materials about which students and community members may hold deep personal opinions. Teachers should take care to align instruction with the Southington Board of Education Controversial Issues Policy. It is the professional responsibility of the teacher to guide students in identifying and analyzing bias in resources through sourcing skills such as author perspectives, source purposes, and intended audiences. Students should be provided the opportunity to discuss varying points of view and draw conclusions through their scholarly analyses and corroboration of a variety of sources with various perspectives.

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Stage 3: Instructional Design

Design EACH learning task for the unit. Copy and paste additional tables below to outline all lessons within the unit.	
Learning Target:	**Success Criteria:**
• I will explain how the Reagan Revolution and economic changes of the 1980s shaped American consumerism, attitudes toward wealth and success, gender expectations, and ideas about the role of government.	• I can explain neoconservatism and supply-side economics as context for cultural change. • I can use economic data and primary sources to identify intended benefits, criticisms, and differing perspectives on Reagan-era policies. • I can analyze yuppie culture and media/advertising as evidence of changing attitudes toward wealth, status, consumption, and the American Dream. • I can compare representations of race and class in 1970s and 1980s television using specific evidence. • I can evaluate the perspective and purpose of a source and corroborate a claim with another source.

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 1: Greed is Good

- Students will learn about the sweeping electoral victory of Ronald Reagan in 1980 and the Reagan Revolution as a response to social and economic upheaval of the previous decades. The benefits and drawbacks of supply-side/"Trickle Down Economics" will be examined as well as changing attitudes on wealth, wages, individualism, consumerism, and the government's role in the economy and the welfare of Americans.
    - Optional resources: Exploring charts and the Reagan Institute: Reagan's economic policies and effects on America, Discussion of the "Greed is Good" speech from *Wall Street,* Examining 1980 Electoral College results map, Yuppies Article: examining changing economic attitudes and urban revitalization/gentrification, Reagan Christmas radio address on the role of government, CNN The Eighties: Greed is Good episode with synthesis/discussion questions

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Exit tickets, worksheets, class discussions, 1980s Building Blocks

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Learning Target:	Success Criteria:
• I will analyze how culture-war debates and public policies in the 1980s and 1990s shaped American attitudes about race, poverty, sexuality, justice, equality, family, and national identity. • I will analyze how media representations influenced public perceptions of racial and social groups.	• I can explain the goals, supporters' arguments, critics' arguments, and social consequences of the War on Drugs. • I can use data to identify patterns in mass incarceration and connect those patterns to debates about race, crime, and equality. • I can explain Iran-Contra as context for debates about trust, authority, and government accountability rather than only recall its facts. • I can compare Black representation in selected 1970s, 1980s, and 1990s television and explain what changed and what remained. • I can analyze how hip-hop artists responded to social conditions and competing ideas about identity, inequality, and resistance. • I can evaluate the perspective, purpose, and evidence of media/documentary sources and corroborate key claims.

Learning Activities

What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 2: Culture Clashes

- This lesson has students examine the wave of public support of Reagan's neoconservatism as not only a transformation of the economic landscape of America, but a push for cultural and societal restructuring. Students will examine policies and ideologies that led to debate and clashes over issues such as poverty, race, authority, sexuality, justice, equality, and American identity.
    - Optional resources: Reagan Christmas radio address on the role and influence of the family, article examining the "welfare queen" stereotype used in Reagan's campaigning, examining Black TV: comparing *The Cosby Show* and *The Fresh Prince of Bel-Air* to *Good Times*, History.com articles on Rodney King and the LA Riots, Reagan public address on Iran-Contra, article and data analysis on the war on drugs and mass incarceration, CNN's *The Nineties* "Can't We All Just Get Along?", teachrock.org's lesson on Gangsta and Conscious Rap's response to '80s and 90's conditions (materials linked here).

Assessment

List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Exit tickets, worksheets, class discussions, 1980s Building Blocks, CAST paragraph from teachrock.org rap lesson.
- Unit 3 Performance Task

- Reagan/1980s Quiz
- *The Nineties* reflections on course themes and EQs

Learning Target:	**Success Criteria:**
• I will analyze how personal computers, the World Wide Web, cable/media expansion, and new consumer technologies transformed communication, work, commerce, entertainment, consumer behavior, and American identity during the 1990s	• I can explain how emerging technologies changed everyday routines and expectations for communication, information, shopping, entertainment, and work. • I can analyze advertisements, archived websites, documentary excerpts, and data as historical evidence of digital-age optimism and anxiety. • I can connect the early internet and dot-com boom to changing ideas about wealth, opportunity, consumerism, and the American Dream. • I can compare multiple sources and identify differences in perspective, emphasis, or evidence. • I can communicate a well-reasoned conclusion about whether new technologies strengthened or weakened American culture in the 1990s.

Learning Activities

What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 3: The World Wide Web/consumer tech

- This lesson explores the massive economic and cultural shifts brought on by the ubiquity of personal consumer technologies, the internet, and the digital age. Emphasis is placed on course themes of consumerism and the American Dream.
    - Optional resources: Opener: Apple 1984 commercial QfT and analysis,CNN's *The Nineties*: "Isn't It Ironic? (The Information Age)," PBS Frontline: *Merchants of Cool*, Wayback Machine primary source investigation, CLRN article "How the Internet Changed Everyday Life, 90s technology advertisement primary source analysis and extension, America at the Millenium, Documentary clips with questions examining economic impacts of the 1990s.

Assessment

List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Exit tickets, worksheets, class discussions
- Merchants of Cool CAST paragraph
- Make a 90s-style ad

- Dot-Com Bubble CAST

Resources

Any materials and resources related to Stage 3 learning activities.

- Canvas
- Youtube
- PBS Frontline
- CNN *The Eighties*
- CNN *The Nineties*
- Sitcoms from the 1980s and 1990s
- Various teen John Hughes films
- *Affluenza*
- *Two American Families: 1991-2024*
- *Inequality for All* (Inequality for All)

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Unit 4 Overview	
Unit Title:	**Unit 4 Digital America: Identity, Connection, and Polarization (9/11/2001–2025)**
Teacher(s):	**Charles Kemp; Kurt Armintrout**
Grade Level/Course:	**10th - 12th Grade**
Length/Dates:	**11 class sessions (88 minutes each)**
Unit Summary: 2-4 sentences describing the main ideas, content and skills of the unit.	**This five-week unit explores the transformation of American society, culture, and politics from September 11th, 2001 to 2025. Students will examine the evolution of social media platforms and their impact on identity formation, the societal impacts of 9/11 and the War on Terror, socioeconomic discussions surrounding credit crises, and increasing political polarization within American society.**

Stage 1: Desired Results

Grade Level/Subject Standard(s)
List the Content Standards, Guiding Principles, or Cross-Curricular Skills this unit will address

CT Social Studies Framework:
US.His.2.c. Analyze the effectiveness of individual and group responses to public policies that they deem to be discriminatory.
US.His.5.c. Analyze how the September 11th attacks shaped perspectives in the United States (e.g., views of Muslims and Sikhs, Department of Homeland Security, Transportation Security Administration, Patriot Act).
US.Civ.14.b. Analyze the impact of multimedia on American politics and public discourse (e.g., 24-hour news cycle, echo chambers, social media algorithms, live streaming, trolls, deep fakes, artificial intelligence).

Inquiry Standards:
US.Inq.1.a Explain how compelling and supporting questions reflect an enduring issue in United States History.
US.Inq.3.a Gather relevant information from multiple sources representing a wide range of views and mediums while using the origin, authority, structure, context, and corroborative value to guide the selection of credible sources.
US.Inq.4.f. Evaluate and implement strategies for individual and collective action to address national problems in classrooms, schools, and out-of-school civic contexts.

Common Core State Standards:
CCSS.ELA-Literacy.RH.11-12.3 Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence.
CCSS.ELA-Literacy.RH.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.
CCSS.ELA-Literacy.RH.11-12.9 Integrate information from diverse sources, both primary and secondary,

into a coherent understanding of an idea or event, noting discrepancies among sources.

Other Goal(s)
List the Disciplinary Transfer Goals that this unit will address

- Analyzing multimedia sources
- comparing multiple sources
- Identify continuity and change
- Construct evidence-based historical arguments

Transfer Goals (Vision of the Graduate)
List the long-term and/or school-wide independent student behaviors that this unit will address.

Critical Thinking Transdisciplinary Goal:
Students inquire, identify, and ethically solve real-world problems through reasoning and a reflection on the challenges and benefits of the process and/or solution(s).

Creativity/Innovation Transdisciplinary Goal:
Students work creatively to design and refine implementation of ideas by taking risks, persevering, and exploring possibilities.

Collaboration Transdisciplinary Goal:
Students flexibly and cooperatively work with others in physical and virtual environments and assume shared responsibility for completing a project or achieving a goal.

Enduring Understanding(s): What are the big picture understandings that are transferable across contexts, places, and times?	• Efforts to protect national security can strengthen collective safety while also creating enduring tensions over individual liberty, belonging, and the meaning of citizenship. • Technological innovation expands connection, access, creativity, and opportunity while also creating new problems involving privacy, inequality, attention, misinformation, and social relationships. • Economic systems connect individual choices, financial institutions, government policy, and global markets, so systemic failures can reshape Americans' confidence in institutions and access to the American Dream. • Information ecosystems shape how Americans understand events, form identities, participate in civic life, and determine whom or what to trust. • Rapid social and technological change can transform everyday behavior and cultural norms faster than institutions and individuals can adapt. • Power in the digital age is increasingly exercised through control of data, platforms, algorithms, information, and access as well as through traditional political and economic institutions. • Persistent inequality can limit opportunity, deepen distrust, and intensify cultural and political conflict even when Americans share broad ideals of freedom and opportunity.
Essential Question(s):	• What does it mean to be an American? • Who has access to the American Dream, and how can economic crises expand or limit that access?

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These questions are related to the enduring understandings and provide relevance for the learning in the unit.	• How does consumer culture shape identity, opportunity, and Americans' ideas about success? • How have representations of racial and ethnic groups in American popular culture changed over time, and what do those representations reveal about belonging and power? • Has technology strengthened or weakened American culture? • When should Americans challenge the status quo? • What values define America?

What will students <u>know...</u> Factual information, vocabulary and basic concepts related to each standard/goal	**What will students <u>be able to do…</u>** Skills, processes and/or knowledge that are related to each standard/goal and which students will be able to use in new contexts/with new material
• How the September 11 attacks reshaped collective memory, patriotism, nationalism, perceptions of Muslims and Sikhs, security policy, civil liberties, and debates over American identity and belonging. • How post-9/11 policies and institutions, including the PATRIOT Act, Department of Homeland Security, and Transportation Security Administration, reflected tensions between liberty and security. • The causes and major mechanisms of the 2008 financial crisis, including the housing bubble, subprime mortgages, mortgage-backed securities, risky lending, credit-rating practices, financial-sector risk, government oversight, institutional failure, and the policy response. • How the financial crisis affected homeownership, employment, household wealth, inequality, trust in institutions, consumer confidence, and competing understandings of the American Dream. • How smartphones, social media platforms, apps, algorithms, and the attention economy changed communication, relationships, entertainment, work, consumer behavior, identity, information access, and civic participation. • How digital access and platform design can create both new opportunities and new inequalities, including the digital divide, privacy concerns, misinformation, echo chambers, and cyberbullying. • How fragmented media environments, social media, partisan identity, and	• Gather relevant information from multiple sources and evaluate origin, authority, structure, context, perspective, and corroborative value. • Integrate and evaluate information presented in diverse formats and media to address compelling and supporting questions. • Evaluate competing explanations for complex events and determine which are best supported by evidence. • Analyze trade-offs between liberty and security using evidence from policy, public opinion, and cultural responses. • Analyze cause-and-effect relationships among economic policy, institutional decisions, individual behavior, and cultural consequences. • Interpret quantitative evidence, including charts, timelines, public-opinion data, and economic data, and connect patterns to cultural claims. • Analyze how media framing, algorithms, and source selection influence public understanding and political discourse. • Distinguish facts, interpretations, opinions, and unsupported claims while noting discrepancies among sources. • Compare continuity and change in major course themes across the 1950s-2025, including the American Dream, consumerism, race/representation, technology, resistance, identity/belonging, and American values. • Construct and defend evidence-based historical and cultural arguments in writing, discussion, simulation, and multimedia inquiry. • Evaluate strategies for individual and collective action and their implications for democratic participation and cultural change.

institutional conflict contribute to political polarization and gridlock, and how polarization affects trust, civic discourse, and democratic health. • How individual and collective responses to public policy and inequality—including protest movements such as Occupy Wall Street—reflect continuing debates about fairness, power, representation, and the American Dream. **Vocabulary:** • Terrorism • Al-Qaeda • Taliban • Weapons of mass destruction (WMDs) • Enhanced interrogation • Nomophobia • Algorithm • echo chamber • Cyberbullying • Cancel culture • Subprime mortgage • Mortgage-backed securities (MBS) • Housing bubble • Too big to fail • TARP • Political polarization • MAGA • COVID-19 • Disenfranchisement • Insurrection • Impeachment • Gerrymandering • Fake news	

Stage 2: Evidence of Student Learning

Performance Tasks

Assessment Evidence What will the student produce? Use the GRASPS model below to design your performance task.
Goal

Students will analyze the complex, interconnected causes of the 2008 financial crisis by examining the roles and responsibilities of multiple stakeholders, then synthesize their understanding by allocating proportional blame across all parties involved.

Role
Students will assume the role of one of eight key stakeholders in the 2008 financial crisis:Wall Street Investment Banks, Mortgage Lenders, Homebuyers/Borrowers, Credit Rating Agencies, The Federal Reserve, The U.S. Government/Congress, Securities and Exchange Commission (SEC), Insurance Companies (AIG)

Audience
Students will present their arguments to: Peers (representing other stakeholder groups in a mock accountability hearing), A neutral panel (the teacher or student judges) who will evaluate the strength of their historical evidence and economic reasoning

Situation
The context is a Congressional hearing-style simulation set shortly after the 2008 financial crisis. Each group must defend their actions, minimize their culpability, and redirect blame to others—mimicking the real-world finger-pointing that occurred during actual Congressional hearings. After all arguments are heard, students step out of role to objectively assess blame distribution.

Product/Performance/Purpose
Students will produce three deliverables:

1. Oral Defense (1-minute argument per group) Each group presents what they did during the crisis (actions, decisions, practices), why they deserve the least blame (defense using economic concepts and historical context), who deserves more blame (accusations with evidence against at least one other group).
2. Written Analysis with Visual: After the simulation, students create a pie chart showing percentage of blame assigned to each of the 8 groups (totaling 100%), a written key/legend identifying each group, and a brief explanation justifying their blame allocation. The purpose of the assessment is for students to demonstrate a nuanced understanding of the various groups and stakeholders that contributed to the early 21st century financial crisis.
3. Cultural Impact Reflection: Students explain how the crisis affected at least THREE of the following in the synthesis question: access to the American Dream/homeownership; consumer confidence and attitudes toward debt; economic inequality; trust in government and financial institutions; generational attitudes toward wealth and security; protest/collective action such as Occupy Wall Street.

Synthesis Question: How did the 2008 financial crisis challenge or reshape Americans' beliefs about opportunity, fairness, responsibility, and the American Dream?

Standards and Criteria for Success, including VoG Alignment

See Unit 4 Performance Task Rubric

Resources

Southington Public Schools Curriculum
American Culture

Any materials and resources related to the performance task that the teacher or student would need to be successful.
Unit 4 Performance Task Responsibility for Financial Crisis

Evaluative Criteria How will you evaluate this task? How will you provide feedback to students?
Unit 4 American Culture Performance Task Rubric

Comments Frame this as any information that would be helpful for a new teacher or a teacher teaching this course for the first time.
Historiographically, you're teaching a period where the "textbook narrative" hasn't solidified yet. Historians are still debating whether social media has been net positive or negative, whether the 2008 response was appropriate, and how to characterize our current political moment. Students (and their families) hold strong, personal opinions about topics like 9/11 security policies, the 2008 bailouts, social media's impact, and especially contemporary political polarization. Your role is to create a classroom culture where multiple perspectives can be examined with historical rigor. When discussing polarization, draw examples from both sides of the partisan divide to demonstrate that you're analyzing the phenomenon itself, not picking teams. The goal is helping students understand *why* people disagree and *how* we arrived at this moment, not adjudicating who is "right." Your success lies not in avoiding controversy but in creating a space where students learn to grapple with complexity, examine their own assumptions, and engage across differences—skills they'll need as citizens navigating the very history you're teaching.

Stage 3: Instructional Design

Design EACH learning task for the unit. Copy and paste additional tables below to outline all lessons within the unit.	
Learning Target:	**Success Criteria:**
• I will analyze how the events of September 11, 2001, changed American culture, values, and national identity using evidence from a variety of sources..	• I can gather information from primary and secondary sources • I can define patriotism, nationalism, and jingoism • I can explain how 9/11 led to debates on what it means to be an American
Learning Activities **What is the actual instructional task that supports student learning in this lesson? Tasks can be linked in here. Include technology integration as applicable to support learning.**	

Southington Public Schools Curriculum
American Culture

Lesson 1: 9/11 Transforms America

This lesson has students consider the enduring legacy of 9/11 on American culture, its collective memory, and American identity. Students will examine media coverage, domestic and foreign policy changes, popular media and culture responses, the ability of nationalism to bring people together or be divisive, and debates balancing the needs of individual liberty vs security.

Optional Activities: 9/11 Documentaries (*Man in Red Bandana, In the Shadow of the Towers: Stuyvesant High on 9/11*), Teachrock.org's Country Music Responds to 9/11, examining the legacy of 9/11 through Pew Research data, Primary/Secondary Source Jigsaw exploration, Balancing National Security and Civil Liberties.

Assessment

List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- 9/11 CER
- Class Debate: Was the PATRIOT Act necessary in post-9/11 America? Students assigned sides.

Learning Target:	Success Criteria:
• I will define key terms and concepts • I will analyze multiple sources of information • I will identify causes of the 2008 financial crisis • I will describe how the financial crisis impacted America	• I can accurately identify detailed definitions of financial terms and organizations involved in the 2008 financial crisis • I can cite specific evidence to explain the 2008 financial crisis timeline, provide cause-and-effect relationships and create an argument for primary responsibility

Learning Activities

What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 2: The 2008 financial crisis: Burst of the Housing Bubble

Entrance ticket "What do you see? What's happening? What might have caused this?" on an image sequence of news headlines from 2008 (foreclosure signs, stock market crashes, breadlines) with no context.

Mini-Lecture explaining the early 2000s economic environment: low interest rates, government push for homeownership, deregulation of financial markets, how easy lending standards allowed more people to buy homes; demand drove prices up; speculation entered the market.

Turn and talk: "If prices keep rising and more people take risky loans, what might happen?" Class share-out.

Independent research work on Part 1 terms and definitions and Part 2 People and Organizations graphic organizers. Show students 2–3 reliable sources (Khan Academy, Federal Reserve Education, INVESTOPEDIA, NPR explainers, PBS Learning Media, SHS Library Data Base).

Part 3 Notes: Students will record guided notes during a power point presentation and teacher-driven lecture on the causes, events and impacts of the 2008 Housing Crisis.
Students will be put into small groups to compare their guided notes and discuss the most important developments in the crisis timeline and to identify connections between the timeline and their research. Groups will share their views with the class on how specific terms, organizations, or people influenced one or more of the events attached to the crisis.
Introduce the context of "Too Big to Fail," including its focus on government officials, financial leaders, and the decisions made during the acute phase of the crisis. Distribute the Part 4 video sheet and preview the five open-ended questions. Have students predict preliminary answers to the questions before viewing. Students should identify the evidence they expect to look for in the film and connect their predictions to their research and guided notes. Encourage students to note direct quotes and scenes that address the questions.
Facilitate brief partner or small-group checks in which students compare evidence, identify gaps, and revise or expand their research, notes and video responses to prepare for summative assessment. Guide students in organizing evidence from their research worksheets, guided notes, and film annotations.
Initiate a brief question-and-answer session addressing confusing terms, timeline events, institutions, and responsibility arguments prior to administering 2008 Housing Crisis Summative Assessment.

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

American Culture: 2008 Housing Crisis Summative Assessment

Learning Target:	
• I can evaluate how technological innovations have changed what it means to live, work, communicate, and participate in American society in the 21st century.	• I will investigate the purpose and development of a modern digital app or technology. • I will explain how it changed everyday life for Americans. • I will compare life before and after its introduction. • I will analyze its impact on American culture from multiple perspectives. • I will develop and defend a claim about whether its overall impact has strengthened or weakened American society.

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

Lesson 3: The Technological Revolution

Southington Public Schools Curriculum
American Culture

Students examine how the technological revolution of the 21st century transformed everyday American life, including communication, relationships, entertainment, consumer behavior, work, access to information, and civic participation. Students investigate the rise of smartphones, social media, apps, algorithms, and the attention economy through documentary evidence, public-opinion data, and digital primary sources, considering both the opportunities and unintended consequences created by these technologies. Throughout the sequence, students analyze issues of privacy, identity, consumerism, misinformation, polarization, and digital inequality while evaluating how technology has changed American values and behavior. In the culminating project, students research a modern app and assess how it changed everyday life and American culture.

- Optional activities: The Facebook Dilemma (examining the expanding roles and influence of social media and algorithms across culture), America Goes Mobile (looks at Pew Research regarding smartphone adoption and "the digital divide"), Social Media and Identity, The Attention Economy (includes a wrap-up reflection and exit ticket that lead into Tech. Rev. Inquiry Performance Assessment).

Assessment
List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Technological Revolution Inquiry Performance Assessment
- Facebook Dilemma CER (in activity)
- Tech. Rev. Inquiry Research Organizer
- Exit tickets, check-ins, worksheets

Learning Target:	Success Criteria:
• I will define terms associated with political polarization/Gridlock • I will analyze how different media sources frame the same issue • I will research a current example of political polarization and/or gridlock in American society	• I can define political polarization/Gridlock, identify historical examples of political division and compare it to current political discourse • I can distinguish between echo chambers, facts, interpretations, and opinions in media sources • I can identify characteristics that separate healthy disagreement from destructive polarization

Learning Activities
What is the actual instructional task that supports student learning in this lesson?
Tasks can be linked in here. Include technology integration as applicable to support learning.

- **Lesson 4: Political Polarization/Gridlock**

Southington Public Schools Curriculum
American Culture

Students investigate how disagreement, political polarization, fragmented media environments, and institutional gridlock affect American democracy. Through source analysis, historical comparison, collaborative discussion, and civil discourse practice, students distinguish between productive political disagreement and destructive polarization. Students will research a current issue or event involving polarization or gridlock and evaluate its causes, effects, and implications for democratic health. The unit maintains political neutrality by emphasizing evidence, source evaluation, multiple perspectives, and the difference between analyzing an issue and advocating for a particular political position. Students should leave with the understanding that democratic health depends not on eliminating disagreement but on managing disagreement through evidence, rights, participation, institutional procedures, and respectful civic engagement.

Students will complete an entrance ticket/turn-talk/share out on: What kinds of disagreement are useful in a democracy? What kinds of disagreement might become harmful? Students will watch short video clip on Political Polarization. After video and class discussion, students will work independently on completing the Political Polarization/Gridlock graphic organizer. Students will be put into groups to take notes on a power point presentation and then complete a group worksheet on Occupy Wall St. Movement. Groups will then complete the Continuum Sort Activity and share out their results. Groups will complete the Facts, Truth, and Media Fragmentation Activity and respond to the question (Exit Ticket) "How can people who use different media sources come to sincerely believe different versions of the same political event?" The final group activity will be the Healthy Disagreement vs. Destructive Polarization, in which they will examine case studies and analyze how disagreement can either support or damage democratic decision-making. Students pick a current example of political polarization and/or gridlock in American society and will independently work on the Political Polarization/Gridlock Research Project, as a summative assessment, where they will apply their research and source-analysis skills to identify a current example of political polarization or gridlock and explain its implications for democratic health.

Assessment

List any formative or summative assessments that should be administered within this learning sequence.
(They can be listed/linked below)

- Occupy Wall Street
- Political Polarization/Gridlock Research Project
- Healthy Disagreement vs Destructive Polarization Activity
- Exit Tickets

Resources

Any materials and resources related to Stage 3 learning activities.

- Too Big to Fail (HBO Films)
- The Social Dilemma (Netflix)
- The Facebook Dilemma (PBS Frontline)
- In the Shadow of the Towers (HBO)
- Man in Red Bandana (ESPN Films)
- Political Polarization | C-SPAN Classroom
- SHS Library Resource Database

- The Federal Reserve History
- The Atlantic
- Pew Research Center — mobile/smartphone adoption and digital-divide data
- SHS Library Resource Database

AMERICAN CULTURE CURRICULUM

SHS Social Studies

Why study American Culture?

American culture is an important part of understanding who we are, what we value, and how Americans understand their place in society. Popular culture, media, music, television, film, technology, consumerism, and social movements all reflect and influence American values and identity. Without an understanding of American culture, students are less prepared to understand the ways Americans have understood and debated identity, race, equality, opportunity, and freedom.

Course Unit Overview

01 Prosperity, Conformity, and the American Dream

02 Rights, Resistance, and Cultural Revolution

03 Culture Wars, Consumerism, and Media Expansion

04 Digital America: Identity, Connection, and Polarization

01

Prosperity, Conformity, and the American Dream

Unit 1: Prosperity, Conformity, and the American Dream (1950-1962)

This unit introduces students to postwar American culture and the development of the 1950s American Dream. Students explore prosperity, suburbanization, consumer culture, gender roles, race and segregation, rock 'n' roll, conformity, and the impact of the Cold War on American life.

Performance Task: The American Dream on Trial

Students use historical sources and popular culture to evaluate who had access to the American Dream—and who did not. They will present their findings in a multimedia presentation.

02

Rights, Resistance, and Cultural Revolution

Unit 2: Rights, Resistance, and Cultural Revolution (1963-1979)

Students will examine the Civil Rights Movement, Black Power, the women's movement, counterculture, the Vietnam War, protest movements, Woodstock, rock music, television, and political and social divisions. Students will investigate how Americans challenged established ideas about race, gender, authority, freedom, and the status quo.

Performance Task: Culture in Conflict

Students investigate a cultural conflict and analyze competing perspectives, values, and challenges to the status quo by creating a podcast episode.

03

Culture Wars, Consumerism, and Media Expansion

Unit 3: Culture Wars, Consumerism, and Media Expansion (1980–2000)

This unit examines the changing cultural landscape of the 1980s and 1990s. Students will explore Reagan-era America, consumerism, the War on Drugs, racial tensions, mass incarceration, the rise of hip-hop, culture wars, globalization, and the expansion of cable television and the internet.

Performance Task: Teen Identity Over the Decades

Students create a cultural magazine article that examines the evolution of teen identity and the portrayal of teens in popular media over multiple decades.

04

Digital America: Identity, Connection, and Polarization

Unit 4: Digital America: Identity, Connection, and Polarization (2001-2025)

Students examine 9/11, the War on Terror, the 2008 financial crisis, social media, racial justice, political polarization, misinformation, and technology. Students will consider whether technology has strengthened American culture or contributed to greater division and polarization.

Performance Task: The 2008 Financial Crisis: Who's to Blame?

Students evaluate the causes of the financial crisis and participate in a debate where they work collaboratively to defend one party's actions and argue why other parties are to blame for the crisis.

THANK YOU

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** November 19, 2026

Decision Requested _____ **Agenda Code** 11 a.

AGENDA REPORTING FORM

Agenda Topic: Policy 1112.7 – Recording Meetings without Consent - NEW - First Reading.

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 1112.7 – Recording Meetings without Consent.

Background: The Policy and Personnel Committee reviews policies with the administration to ensure they are current and appropriate.

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: The Board of Education Policy & Personnel Committee is bringing the draft Policy 1112.7 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 1112.7

Frank Ryan

Signature of Staff Member Submitting Report

Peter Madaras

Signature of Superintendent of Schools

Policy 1112.7

Recording Meetings without Consent – NEW Policy

Draft

This model policy, a collaborative effort between CABE and Shipman and Goodwin, asserts a local school board's authority to establish rules that prohibit surreptitious recording of others in the school setting to maintain a climate of trust.

Community Relations/Personnel-Certified/Non-Certified

Recording Meetings Without Consent

I. Purpose

The Southington Board of Education (the "Board") is committed to fostering a culture built on mutual trust, open communication, and professional ethics. The Board finds that unauthorized or secret recordings of conversations (whether between staff and supervisors, or between school employees and students or parents) undermine the consultative process, inhibit candid feedback, and create an adversarial environment. Such actions are considered highly offensive to a reasonable person and detrimental to the educational climate.

II. Definitions

- **Secretly Recording**: The act of recording a conversation or interaction (audio or video) without notifying all participants and obtaining their express verbal or written consent at the outset.

- **Meeting**: Any scheduled or informal gathering, whether in person or via digital/virtual platforms, where school business, student progress, or employment matters are discussed.

- **Supervisor**: Any individual with authority to direct, evaluate, or oversee the work of a Board of Education employee.

- **Staff Member**: Any person employed by the Board of Education, whether certified or non-certified.

III. Prohibited Conduct

Except as otherwise provided by law or this policy, all persons on school property, or participating in school-sponsored activities (including virtual environments), are prohibited from surreptitiously recording any meeting or conversation where there is a reasonable expectation of privacy.

1. This prohibition encompasses audio, video, and the use of AI-based automated notetaking or transcription services (e.g., Otter.ai, Fireflies, Zoom AI) that record or process the audio of a meeting without the knowledge and consent of all participants.

2. This policy is intended to prevent the unauthorized recording of private professional interactions, confidential student matters, and internal administrative consultations. It is not intended to prohibit recording in public or semi-public forums where there is no expectation of privacy.

IV. Exceptions and Limitations

This policy shall not apply to:

- Recordings of meetings subject to the Connecticut Freedom of Information Act (FOIA) held in public session.

- The use of built-in recording features in platforms such as Zoom, Microsoft Teams, or Google Meet, provided the recording is initiated by the host for administrative purposes and the platform provides an automatic notification (audible or visual) to all participants that recording is in progress.

- Casual photography or videography during public school events, such as athletic competitions, theater performances, or graduation ceremonies, where participants generally expect to be viewed or recorded by the public.

- Incidental recording in common areas (e.g., hallways, cafeteria) where the purpose is social or commemorative and not intended to capture private conversations or sensitive student/staff information.

- Recordings made by an employee or student for the sole purpose of documenting harassment, discrimination, or criminal activity, provided the individual is a party to the conversation and recording is used specifically for reporting to school administration, law enforcement, or relevant state agencies (e.g., DCF, CHRO).

- The accidental or incidental capture of background audio or video where there was no intent to surreptitiously monitor a specific conversation.

- **Special Education (PPT/504)**: Meetings involving the development of an IEP or Section 504 Plan, where recording is permitted in accordance with federal and state guidelines, provided that the party wishing to record gives reasonable advance notice to all participants.

- **Professional Evaluation**: Situations where recording is a formal part of an evaluation or professional development program previously agreed upon by the administration and the relevant employee/union.

- **Legal Mandates**: Activities conducted at the direction of law enforcement or as required by a valid subpoena or court order.

V. Procedures for Authorized Recording

If a person wishes to use an AI note-taker or an external recording device during a non-public meeting, they must:

1. Announce the use of the tool at the start of the meeting and receive consent from all parties.

2. Explicitly state the purpose of the recording on the record.

3. If any participant objects to the recording or AI-transcription, the recording must be stopped immediately.

4. If AI-transcription is used for a meeting involving student data, the tool must comply with the District's data privacy requirements and the Connecticut Student Data Privacy Act.

5. The recording must be "open and obvious."

6. If a visitor or staff member is authorized to record, the District reserves the right to simultaneously record the meeting.

7. Any recording made by an employee on a district device or in an official capacity becomes a record of the District and must be maintained in accordance with State Record Retention Schedules (e.g., Schedule M1) and FERPA, where applicable.

VI. Consequences for Violation

Unauthorized recording is considered a violation of personal courtesy, professional ethics, and Board policy.

- **Students**: May be subject to disciplinary action, including suspension or expulsion, in accordance with Board policy and state law.

- **Employees**: May be subject to disciplinary action, up to and including termination, in accordance with applicable collective bargaining agreements and the "just cause" standard where required.

Legal References: Connecticut General Statutes

1-200 et seq. (Freedom of Information Act)

10-233c Suspension/Expulsion

10-233d Suspension/Expulsion

52-570d (Recording of oral private communications)

WVIT v. Grey, 18 Conn. L. Rptr. 203 (1996)

Restatement 2d of Torts, Section 652b (1977)

Federal Law: Family Educational Rights and Privacy Act (FERPA), 20 U.S.C. § 1232g

Individuals with Disabilities Education Act (IDEA), 20 U.S.C. § 1400 et seq.

Policy:
Adopted
November 2026

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** November 19, 2026

Decision Requested _____ **Agenda Code** 11 b.

AGENDA REPORTING FORM

Agenda Topic: Policy 5131.3 – Managing Instructional Screen Time - NEW - First Reading.

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 5131.3 – Managing Instructional Screen Time.

Background: The Policy and Personnel Committee reviews policies with the administration to ensure they are current and appropriate.

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: The Board of Education Policy & Personnel Committee is bringing the draft Policy 5131.3 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 5131.3

Frank Ryan

Signature of Staff Member Submitting Report

Peter Madaras

Signature of Superintendent of Schools

Policy 5131.3

Managing Instructional Screen Time – NEW Policy

Draft

The following model policy expands upon existing CABE guidelines and the Connecticut State Department of Education (CSDE) position statements on personal technology, extending the scope to encompass district-issued laptops, tablets, and general instructional screen time.

This policy balances the need for face-to-face peer interaction and offline learning with the district's responsibility to foster digital citizenship and provide resources to enhance academic skills.

Students

Managing Instructional Screen Time

I. Purpose and Philosophy

The [District Name] Board of Education recognizes that digital tools, including district assigned laptops, tablets, and personal smart devices, are valuable learning resources when used intentionally. However, the Board also acknowledges growing concerns regarding excessive screen time and its impact on students' social-emotional well-being, physical health, and interpersonal development.

This policy establishes reasonable limits on daily school-day screen time to ensure that technology serves as a purposeful complement to, rather than a replacement for, high-quality, face-to-face instruction, collaborative peer learning, and hands-on, offline experiences.

II. Definitions

- **Instructional Screen Time** is the period during which a student is actively looking at a digital display (laptop, tablet, interactive whiteboard, or smartphone) for educational purposes.
- **Passive Screen Time** is the time spent consuming media digitally without active cognitive engagement, creation, or interaction (e.g., watching a video clip without an accompanying interactive task).
- **Active Screen Time** is the time spent using technology to create, problem-solve, collaborate, or program (e.g., writing, digital art, or collaborative editing).
- **Personal Smart Devices** include, but are not limited to, cell phones, smartwatches, or other wearable or portable technology capable of connecting to the Internet or transmitting data.

III. Screen Time Limits & Guidelines by Developmental Level

Consistent with CSDE guidance on restricting personal device use based upon developmental readiness, screen time shall be structured to reduce the risk of overexposure in younger grades while gradually building digital autonomy in older grades. The superintendent shall draft administrative regulations to provide such developmental guidelines for maximum continuous device use, a recommended daily cap for instructional uses, and restrictions for recess, lunch, and other non-instructional times.

Students

Managing Instructional Screen Time (continued)

Elementary and Middle School Standards (Pre-K through Grade 8)

- For every 20–30 minutes of continuous instructional screen time, educators shall make every effort to integrate a "screen break" involving physical movement, eye-strain relief, or offline peer discussion.
- Reading physical books and integrating physical writing activities shall be encouraged where appropriate. Every reasonable and pedagogically sound attempt shall be made to integrate tactile learning materials into teacher lessons and classroom activities.
- Lunch, recess, and transitions between classes are designated as socially interactive, screen-free zones. District-issued devices must remain closed or put away. **High School Standards (Grades 9 through 12)**
- High school courses shall maintain an appropriate blend of “digital” and “analog” instruction. For courses that rely heavily on digital platforms, teachers are encouraged to designate "analog days" or “tech-free sessions” where appropriate.
- Students may utilize district-assigned laptops in the library/media center or designated study halls for academic purposes but are encouraged to limit passive screen consumption during unstructured personal time.

IV. Dual Mandate: Digital Citizenship vs. Offline Interaction

To achieve a healthy equilibrium, schools must actively cultivate two distinct environments:

A. Cultivating Digital Citizenship

Teachers are strongly encouraged to explicitly teach students how to govern their relationship with technology. Curricula aligned with ISTE (International Society for Technology in Education) standards shall be integrated into teaching:

- **Self-Regulation:** Helping students recognize the signs of digital fatigue and hyper-stimulation.
- **Digital Footprints & Safety:** Educating students on data privacy, the mechanics of social media algorithms, and cyberbullying prevention.
- **Academic Integrity:** Proper citation of digital sources and the ethical boundaries of Artificial Intelligence (AI) tools.

B. Prioritizing Face-to-Face Interaction

To counteract social isolation, administrators and staff shall design school environments that emphasize interpersonal engagement:

- Interactive, cooperative learning structures (e.g., Socratic seminars, think-pairshare, group project builds) shall be prioritized over individualized, self-paced screen-oriented modules.

- School-wide initiatives shall be encouraged to incentivize authentic peer-topeer relationships.

Students

Managing Instructional Screen Time (continued)

V. Practical Considerations and Exceptions

Section 504 and Individualized Education Programs (IEPs): The screen time limits and device restrictions outlined in this policy shall not override any accommodations or assistive technology requirements specified in a student's IEP, Section 504 plan, or English Language Learner (ELL) accommodation plan.

- Accommodations for mandatory state-wide testing (e.g., Smarter Balanced, NGSS, SATs) are exempt from daily screen time calculations.
- Teachers should consider a student's total daily screen time when assigning homework. Whenever possible, reading assignments or brainstorming tasks should be available in print formats to minimize evening screen time.
- To enforce the limited screen-time during the school day without compromising safety, parents wishing to contact their children during the day may do so through the school's main office or approved, non-disruptive district messaging platforms.

VI. Implementation and Professional Development

The Superintendent or designee shall ensure that district staff receive ongoing professional development regarding:

- High-quality, cognitively engaging instruction that does not rely on digital screens.
- Designing balanced lesson plans that effectively provide opportunities for active digital creation with collaborative offline interaction.
- Recognizing and addressing the behavioral and physical signs of excessive screen exposure in children.

(cf. 5131.81 - Use of Electronic Devices)
(cf. 4118.6 - Personal Use of Cellular Devices)
(cf. 6141.321 – Responsible Use of the Internet)
(cf. 6141.32 - Computer Literacy)
(cf. 6156 - Use of Computers in Instruction)
(cf. 6140 - Curriculum)
(cf. 6142.104 - Play-Based Learning)

Legal Reference: Connecticut General Statutes

10-221 Boards of education to establish rules, policies, and procedures.

10-221o Lunch periods and physical activity.

10-233c Suspension of pupils.

10-76a et seq. Special Education

Students

Managing Instructional Screen Time

Legal References: (continued)

Federal Law
Section 504 of the Rehabilitation Act of 1973, 29 U.S.C. § 794.

Individuals with Disabilities Education Act (IDEA), 20 U.S.C. § 1400 et seq.

Title VI of the Civil Rights Act of 1964, 42 U.S.C. § 2000d et seq.

Children's Online Privacy Protection Act (COPPA), 15 U.S.C. § 6501 et seq.

Connecticut State Department of Education, Position Statement on Educational Technology.

Connecticut State Department of Education, Guidance on Restricting Personal Technology and Mobile Devices in Schools (2024)

Policy adopted:
cps 6/26

Sample policies are distributed for demonstration purposes only. Unless so noted, contents do not necessarily reflect official policies of the Connecticut Association of Boards of Education, Inc.

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** November 19, 2026

Decision Requested **Agenda Code** 11 c.

AGENDA REPORTING FORM

Agenda Topic: Policy 5141.3 – Health Assessments and Immunizations - Revised - First Reading.

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 5141.3 – Health Assessments and Immunizations

Background: The Policy and Personnel Committee reviews policies with the administration to ensure they are current and appropriate.

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: The Board of Education Policy & Personnel Committee is bringing the draft Policy 5141.3 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 5141.3

Frank Ryan

Signature of Staff Member Submitting Report

Peter Madaras

Signature of Superintendent of Schools

Policy 5141.3

Health Assessments and Immunizations – Revised Policy

Draft

Series 5000: Students

Welfare

Health/Illness

Health Assessments and Immunizations

The board recognizes the importance of periodic health assessments according to state health regulations.

To determine the health status of students, facilitate the removal of handicaps to learning, and find out whether some special adaptation of the school program may be necessary, the board of education may request that students have health assessments.

The board of education adheres to those state laws that pertain to school immunizations and health assessments. The board may deny continued attendance in school to any student who fails to obtain the required health assessments.

The policies of the Southington Public Schools shall not be construed to require any pupil to undergo a physical or medical examination or treatment, or be compelled to receive medical instruction if the parent/guardian of such pupil, or the pupil, if such pupil is an emancipated minor or is eighteen years of age or older, in writing, notifies the teacher or principal or other person in charge of such pupil that he/she objects, on religious grounds, to such physical or medical examination or treatment or medical instruction.

If, in accordance with state law, a student presents a certificate from his/her physician certifying that in his/her opinion such vaccination or immunization would not be prudent on account of the student's physical condition, or ~~a statement from his/her parent/guardian indicating that such vaccination or immunization would be contrary to his/her religious beliefs~~ in the case of a child enrolled in a preschool program or other prekindergarten program who, prior to April 28, 2021, was exempt from the applicable immunization requirements upon presentation of a statement that such immunizations would be contrary to the religious beliefs of such child or the parents or guardian of such child, as such additional immunizations are recommended, in a written declaration, in a form prescribed by the Commissioner of Public Health, for such child by a physician, a physician assistant or an advanced practice registered nurse. Such statement of religious beliefs shall be acknowledged by a judge of a court of record or a family support magistrate, a clerk or deputy clerk of a court having a seal, a town clerk, a notary public, a justice of the peace, an attorney admitted to the bar of this state, or a school nurse;

or, in the case of immunization against mumps, measles, varicella, and rubella, a statement from a physician or director of health that the student has previously had the disease, the student shall be excused from this requirement. If such exemption is not permanent, written proof of continued exemption must be submitted annually. The school nurse or, in her/his absence, the building principal, shall be responsible for securing and verifying proof of compliance with the immunization requirement.

A tuberculin risk assessment is recommended prior to entering school and during each mandated health assessment.

New students from out of country are required to receive a mantoux tuberculin skin test.

Series 5000: Students

Welfare

Health/Illness

Legal Reference:
General Statutes of Connecticut
Chapter 169, Sections 10-204, 204a, and 208 P.A. 78-165
Commissioner's Circular Letter C8, Series 1978-79 P.A. 81-139 No record of any student medical assessment may be open to the public.
10-204 Vaccination
10-204a Required immunizations
10-205 Appointment of school medical advisers
10-206 Health assessments
10-206a Free health assessment
10-207 Duties of medical advisers
10-208 Exemption from examination or treatment
10-209 Records not to be public
10-212 School nurses
10-213 Vision, audiometric and postural Screenings

Policy Reviewed: December 1976, January 1979, October 1981
Policy Revised: May 1987, October 1993
Policy Reviewed: November 1993
Policy Revised: January 1997, May 2000, November 2005
Policy Reviewed: March 2012
Policy Revised: November 2026

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** November 19, 2026

Decision Requested **Agenda Code** 11 d.

AGENDA REPORTING FORM

Agenda Topic: Policy 9271 – Code of Ethics - Revised - First Reading.

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 9271 – Code of Ethics

Background: The Policy and Personnel Committee reviews policies with the administration to ensure they are current and appropriate.

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: The Board of Education Policy & Personnel Committee is bringing the draft Policy 9271 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 9271

Signature of Staff Member Submitting Report

Signature of Superintendent of Schools

Policy 9271
Code of Ethics –
Revised Policy
Draft

Series 9000: Bylaws of the Board

Members

Code of Ethics

The Board of Education adheres to the following code of ethics for its individual members:

1. I will be a staunch advocate of high quality free public education for all Connecticut children. In fulfilling my responsibilities, I will think of the "children first."
2. I will, as an agent of the state, uphold and enforce all laws, rules, regulations, and court orders pertaining to public schools. I will strive to bring any needed change only through legal and ethical procedures.
3. I will strive to help create public schools, which meet the individual educational needs of all children regardless of their ability, race, creed, gender, physical condition or social standing, sexual orientation, or color.
4. I will work to help my community understand the importance of proper support for public education in providing: adequate finances, optimum facilities, staffing, resources, and better educational programs for children.
5. I will join with my Board, staff, community, and students in becoming fully informed about the nature, value, and direction of contemporary education in our society. I will support needed change in our schools.
6. I will work to fully and accurately inform the community about our schools and will communicate their viewpoint to the administration.
7. I will recognize that my responsibility is to work with my fellow Board members to see that the schools are well run through effective policies and not to administrate the schools.
8. I will work with my fellow Board members to frame and evaluate policies and plans only after the Board has consulted with those affected by its activities.
9. I will arrive at conclusions only after discussing all aspects of the issue at hand with my fellow Board members in a meeting. I will respect the opinions of others, and abide by the principle of majority rule.
10. I will acknowledge that authority rests only with the whole Board assembled in a meeting. I will make no personal promises nor take any private action, which may compromise the Board.

Series 9000: Bylaws of the Board

Members

Code of Ethics (continued)

11. I will acknowledge that the Board represents the school system to the community, and will refuse to surrender my independent judgment to special interests or partisan political groups.
12. I will hold confidential, all matters pertaining to schools, which if disclosed, might needlessly injure individuals or the school system.
13. I will insist that all school business transactions be open and ethical.
14. I will strive to appoint the best professional leader available when a vacancy exists in the chief administrative position.
15. I will strive to appoint the best personnel available upon recommendation by the appropriate administrative officer.
16. I will support and protect school personnel in the proper performance of their duties. I will strive to ensure that all personnel have the responsibilities and the authority to perform effectively.

~~16~~.17. I will refer complaints through the proper chain of command within the system and will act on such complaints at public meetings only when administrative solutions are exhausted.

Reference:
"Standards of Leadership for Members of Boards of Education" (CABE Board of Directors, 2008)

Bylaw adopted by the Board: January 1990
Bylaw reviewed by the Board: April 2003
Bylaw revised by the Board: February 2009
Bylaw reviewed and recoded: June 22, 2017
Bylaw revised: November 2026

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** November 19, 2026

Decision Requested _____ **Agenda Code** 11 e.

AGENDA REPORTING FORM

Agenda Topic: Policy 9321 – Time, Place, Notification of Meetings - Revised - First Reading.

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 9321 – Time, Place, Notification of Meetings

Background: The Policy and Personnel Committee reviews policies with the administration to ensure they are current and appropriate.

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** N/A

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: The Board of Education Policy & Personnel Committee is bringing the draft Policy 9321 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 9321

Frank Ryan

Signature of Staff Member Submitting Report

Peter Madaras

Signature of Superintendent of Schools

Policy 9321

Time, Place, Notification of Meetings – Revised Policy

Draft

Series 9000: Bylaws of the Board

Methods of Operation

Time, Place, Notification of Meetings

All meetings of the Board of Education shall be conducted in compliance with Public Act 75-342, Sec. 6 (An Act Concerning Freedom of Information).

1. **Regular Meetings** – Regular meetings of the Board of Education shall generally be held ~~on the second and/or fourth Thursday of each month~~ at a date and time to be determined and at the established Board meeting place. ~~At a minimum, one (1) meeting date per month will be set by the Board.~~ Meeting dates, times, and places may be changed at the discretion of the Board.

   a. The schedule of regular meetings of the Board of Education for the ensuing calendar year shall be filed with the Town Clerk no later than December 1 of each year, and no such meeting of the Board shall be held sooner than thirty (30) days after such schedule has been filed.

   b. An agenda will be posted at Town Hall, the Board's Administrative Offices, and on the Board's Internet web site. Any associated documents that may be reviewed by members of the Board at such meeting shall be posted on the Board's Internet web site, provided such documents are not exempt from disclosure under the Freedom of Information Act.

2. **Special Meetings** – Special meetings of the Board of Education shall be called by the Chairperson upon written request of three (3) of the members or whenever deemed necessary by the Chairperson. The call shall state the purpose of the meeting and no other business shall be transacted. Special meetings may not be called for the purpose of election of officers or for a vote to fill a vacancy on the Board.

   a. Notice of special meetings shall be given not less than twenty-four (24) hours prior to the time of such meeting by posting a notice of the time of such meeting in the office of the Town Clerk. In the case of an emergency, a special meeting may be held without complying with the foregoing requirement for the posting of notice, but a copy of the minutes of any such special meeting adequately setting forth the nature of the emergency and the proceedings occurring at such meeting shall be filed with the Town Clerk no later than seventy-two (72) hours following the holding of such meeting.

   b. Workshops of the Board of Education are held when it is necessary for the Board to discuss and consider, in depth, matters pertaining to Board of Education business. The Chairperson shall call workshops whenever deemed necessary or when requested by three (3) or more Board of

Series 9000: Bylaws of the Board

Methods of Operation

Time, Place, Notification of Meetings (cont'd)

Education members. Notice of workshops shall be given not less than forty eight (48) hours prior to the time of such meetings by posting a notice of both the time and place in the office of the Town Clerk. The agenda will state the purpose(s) of the meeting and no other business will be transacted. The Chairperson of the Board may invite those individuals, groups or agencies that have relevant information, knowledge or experience to contribute to the discussion and to the Board's decision making process. Other public input will be allowed at the discretion of the Board Chairperson. No formal votes will be taken during or at the conclusion of workshops.

3. **Committee Meetings** – The Chairperson of each committee will notify the Board as to the location, date, and time of all meetings. (cf 8133)

4. **Adjourned Meetings** – Any meeting of the Board of Education may be adjourned to a time and place specified in the order of adjournment.

5. **Quorum** – Five (5) members of the Board shall constitute a quorum for the transaction of business except where otherwise noted in Board policies.

6. **Parliamentary Procedure** – Robert's Rules of Order shall govern the proceedings of the Board, except when those rules are in conflict with the Board's approved policies and regulations. The Superintendent of Schools is designated as Board of Education parliamentarian.

7. **Agenda Notice** – The agenda for regular meetings of the Board of Education shall be given to all members a minimum of six (6) days prior to the meeting. Other business included on the agenda may be transacted by two thirds vote of all members present unless the subject is specifically referenced in other Board policies.

8. **Order of Business** - The order of business at each regular meeting of the Board of Education shall be as follows:

8.1 Call to Order
8.2 Pledge of Allegiance
8.2.1 Celebration of Excellence (as appropriate)
8.3 Approval of Minutes

Series 9000: Bylaws of the Board

Methods of Operation

Time, Place, Notification of Meetings (cont'd)

8.4 Public Communications
- a. Student Representatives
- b. Board of Education
- c. Administration
- d. Public

8.5 Committee Reports
8.6 Personnel Report (as appropriate)
8.7 Old Business
8.8 New Business
8.9 Public Communications
- a. Public

8.10 Adjournment

9. **Requests for Hearing on Transportation** – Requests for hearings on transportation must be made in writing. The Board of Education shall hold such hearing within ten (10) days after receipt of written request and shall make a finding within ten (10) days after such hearing and in accordance with regulations of the State Board of Education.

(cf. 9327 – Electronic Mail Communications)

Legal Reference:
Connecticut General Statutes
- 1-200 (2) Definitions. "Meeting"
- 1-206 Denial of access to public records or meetings.
- 1-225 Meetings of government agencies to be public, as amended by June 11 Special Session, PA 08-3
- 1-227 Mailing of notice of meetings to persons filing written request.
- 1-228 Adjournment of meetings. Notice.
- 1-229 Continued hearings. Notice.
- 1-230 Regular meetings to be held pursuant to regulation, ordinance or resolution.

Series 9000: Bylaws of the Board

Methods of Operation

Time, Place, Notification of Meetings (cont'd)

- 10-218 Officers. Meetings
  - Section 6 of Public Act 23-160

Bylaw adopted by the Board: January 1990
Bylaw revised by the Board: April 1993
Bylaw reviewed by the Board: April 2003
Bylaw revised by the Board: March 2005
Bylaw revised by the Board: February 2009
Bylaw updated and recoded: June 22, 2017
Bylaw revised by the Board: January 2022
Bylaw revised by the Board: January 2023
Bylaw revised by the Board: January 2024
Bylaw revised by the Board: May 2025
Bylaw revised by the Board: November 2026

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 11 f1.

AGENDA REPORTING FORM

Agenda Topic: Approval of Job Description – Food Services Operations Manager - NEW.

Summary of Issue: Approval of Job Description – Food Services Operations Manager - NEW.

Background: N/A

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** _____

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Move that the Board of Education approve the job description presented by the administration.

Titles of Attachments:
1. Job Description

Frank Ryan
_____
Signature of Staff Member Submitting Report

Steven Madaras
_____
Signature of Superintendent of Schools

Food Services Operations Manager - NEW

SOUTHINGTON Public Schools

JOB DESCRIPTION

TITLE: FOOD SERVICES OPERATIONS MANAGER

QUALIFICATIONS:

1. Associate's degree, or equivalent, in nutrition, dietetics, business administration, or a related field.
2. Experience in school or other quantity food service management preferred with emphasis on nutrition, instructional management, and quantity food production.
3. Understanding of Farm to School and local food procurement.
4. Culinary skills with ability to train and inspire staff.
5. Knowledge of food safety and sanitation procedures.
6. Maintains a valid Qualified Food Manager Certificate.
7. Demonstrates the ability to work cooperatively and effectively with students, colleagues, and families.
8. Excellent computer skills including experience with food service operations, Microsoft Office™ (Word, Excel, Outlook) and Google.
9. Excellent written and verbal communication skills

REPORTS TO:
Food Service Director

JOB GOAL:
To assist the Food Service Director in overall leadership of the district's school nutrition program by assisting in the planning, coordination, and management of the food service operations. The role focuses on advancing the Farm to School initiative and culinary program enhancements to elevate the dining experience for students and staff.

PERFORMANCE RESPONSIBILITIES:

1. Assist in the daily management of the food service department, ensuring compliance with USDA, state, and local regulations.
2. Support and implement menu development, menu production records, and recipe development.
3. Monitor kitchen operations for efficiency, quality and adhering to standardized recipes.
4. Develop and expand Farm to School initiatives, including procurement of local and regional foods. Including building partnerships with farms and promoting agricultural literacy.
5. Effectively communicates management decisions to achieve understanding and acceptance to food service staff and students.
6. Provide leadership and supervision that promotes a common purpose, teamwork, and strengthens employee morale.
7. Assist in marketing strategies to students and district families.

DRAFT

8. Promotes collaboration and positive relationships with parents, families, school administration and the broader school community.
9. Engage in continuous professional growth and development.
10. Performs other duties as assigned by the Food Service Director.

TERMS OF EMPLOYMENT:
Ten-month work year with salary, benefits, and working conditions established by the Board of Education. This is a non-union position.

EVALUATION:
Performance to be evaluated annually by the Food Service Director.

DRAFT

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** November 19, 2026

Decision Requested X **Agenda Code** 11 f2.

AGENDA REPORTING FORM

Agenda Topic: Approval of Job Description – Family Resource Center of Southington Parent Educator - Revised.

Summary of Issue: Approval of Job Description – Family Resource Center of Southington Parent Educator - Revised

Background: N/A

Alternative Strategies: N/A

Cost (if applicable): N/A **Funding Source:** _____

Beginning Date of Program or Project: N/A

Ending Date of Program or Project: N/A

Recommendation or Comment: Move that the Board of Education approve the job description presented by the administration.

Titles of Attachments:
1. Job Description

Frank Ryan
Signature of Staff Member Submitting Report

Glenn Madaras
Signature of Superintendent of Schools

Family Resource Center of Southington Parent Educator - REVISED

SOUTHINGTON Public Schools

JOB DESCRIPTION

TITLE: **Family Resource Center of Southington Parent Educator**

QUALIFICATIONS:

1. An associate or bachelor's degree in early childhood education, child development or related field preferred.
2. Minimum three (3) years' experience with early childhood education, child development, parent educator, or related education field preferred.
3. Ability to model and facilitate appropriate parent-child interactions.
4. Experience with public speaking or group facilitation.
5. Experience working with a diverse population.

REPORTS TO:
Family Resource Center of Southington Director

JOB GOAL:
To assist the Family Resource Center of Southington Director with the development and implementation of all programming for families; including, but not limited to:
parent/child playgroups, story hours, and workshops.

RESPONSIBILITIES:

1. On-site or off-site program facilitation.
2. Assists with planning and implementation of playgroups.
3. Facilitates and coordinates workshops with Director.
4. Provides childcare, when needed.
5. Develops and Facilitates craft and reading activities.
6. Inventories Family Resource Center of Southington supplies and equipment.
7. Attends appropriate professional development workshops/conferences.
8. Develops and maintains family enrollment database.
9. Other activities or tasks as assigned by Family Resource Center of Southington Director.

TERMS OF EMPLOYMENT:
This is an hourly position, 46 weeks per calendar year. Summer schedule to be determined yearly.

Hours may be day or evening, as determined by Family Resource Center of Southington Director. Work days to coincide with the Family Resource Center operation. Hours/days are subject to change as dictated by program needs.

EVALUATION:
Performance to be evaluated annually by the Southington Public School's Special Education Coordinator in conjunction with the Family Resource Center of Southington Director.

DRAFT

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only_____ Board Meeting Date November 16, 2026

Decision Requested X Agenda Code 11 h.

AGENDA REPORTING FORM

Agenda Topic: Acceptance of SHS Solar Project Completion (DAS 131-0131 PV)

Summary of Issue: The BOE needs to accept the completion of the SHS Solar Photovoltaic project so that the town may request final payment of the state grant funding.

Background: The SHS Solar Photovoltaic project was overseen by the appointed Town Building Committee with a grant commitment from DAS for 54.64% of eligible cost to be reimbursed.

Alternative Strategies:

Cost (if applicable): **Funding Source:**

Beginning Date of Program or Project: September 2024

Ending Date of Program or Project: December 2026

Recommendation or Comment: Move that the Southington Board of Education formally accept the Southington High School Rooftop Solar Photovoltaic Project, Connecticut Department of Administrative Services (DAS) Project Number 131-0131 PV, as complete, and authorize the Superintendent of Schools to execute and submit Form DAS-1049F (Final Grant Application for a School Building Project), Form DAS-1046S (Final Payment Request), and all related closeout documentation to the Connecticut DAS Office of Grants Administration.

Steven Madansky

Signature of Superintendent