Southington Board of Education Meeting

Thursday, April 28, 2022 6:00 PM
John Weichsel Municipal Center Public Assembly Room, 200 North Main Street, Southington, CT 06489
200 North Main Street
Southington, CT 06489

COMMITTEE OF THE WHOLE - OPERATIONS

1. CALL TO ORDER
2. Executive Session
   a. Unaffiliated Compensation
   b. Student Matters
3. Reconvene Meeting - Regular Session - 7:00 p.m.
4. Pledge of Allegiance
5. Celebration of Excellence - Oratorical Contest Winner - Elise Jamharian
6. Southington Steps Presentation
7. Approval of Minutes - March 24, 2022
8. Public Communications
   a. Communications from Student Board Representatives
   b. Communications from Board of Education
   c. Communications from Administration
   d. Communications from Public
9. Committee Reports
   a. Policy & Personnel Committee Meeting - April 20, 2022
10. Superintendent's Report
    a. Personnel Report
11. Old Business
    a. Town Government Communications
    b. Science - Grade 2 Units - Second Reading
12. New Business
    a. Southington Public Schools Last Day of School 2022
    b. Adoption of 2023 Board of Education Meeting Dates
    c. Out of State/Overnight Field Trip Approval
    d. Policy 4118.4 - Staff Ethics - Revision - First Reading
    e. Policy 5145.2 -Freedom of Speech/Expression - Revision - First Reading
    f. Policy 6162 - Care of Instructional Materials - Revision - First Reading
13. Adjournment

STEPS

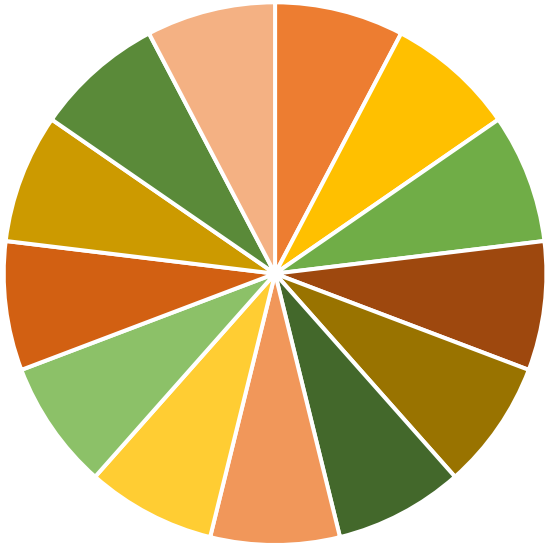
Search Institute Attitudes and Behaviors Survey

Administered to Southington Students:

Grades 7, 9 & 11

2022 Data

THE STEPS COALITION



- Law Enforcement
- Military
- Medical
- Education
- Youth Serving
- Reducing Substances
- Parent
- Media
- Local Government
- Business
- Youth
- Civic / Volunteer
- Faith

Our Mission:

To make substance misuse prevention a priority in the Southington Community through:

1. Education/Awareness
2. Reducing access
3. Policy change

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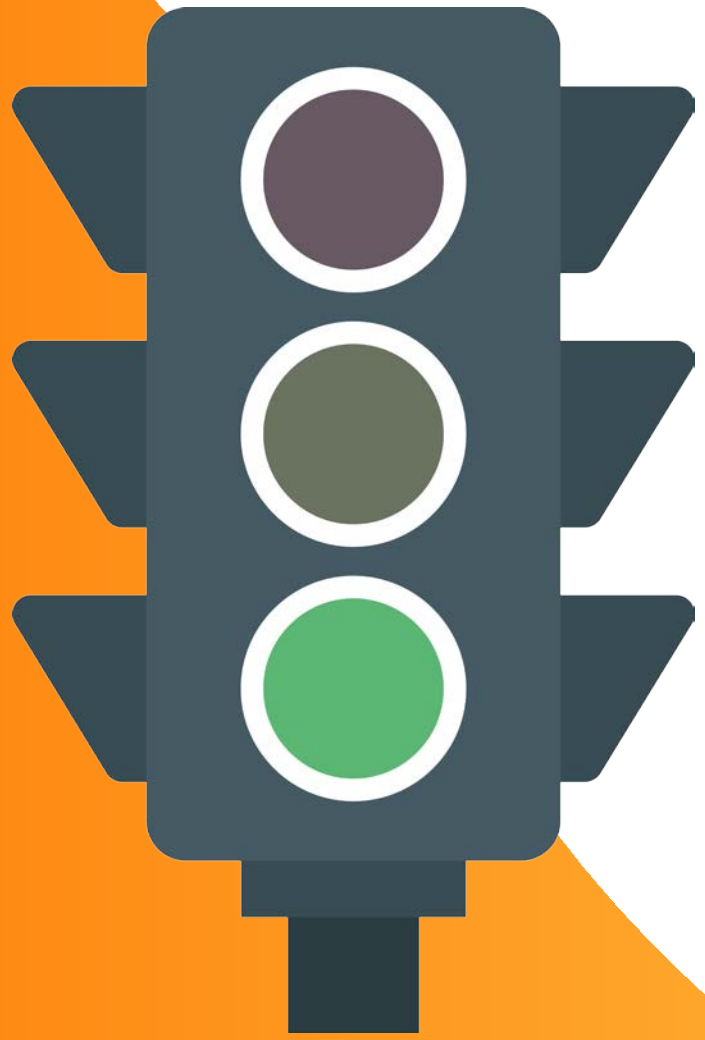
STEPS
www.southingtonsteps.org



Town of Southington Seal 1779 Qui Transtulit Sustinet Connecticut

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dmhas

Executive Office of the President of the United States

SAMHSA
Substance Abuse and Mental Health Services Administration

the YMCA

Southington Police To Protect & Serve 1779 Connecticut

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ASSET BUILDING CLASSROOMS

Within the Southington school system, we use our Asset Building Classroom model (ABC for short) to support our prevention efforts.

WHAT SURVEY DO WE USE?

- **Search Institute Attitudes & Behaviors Survey**
  - Scientific Instrument used to collect data
  - Accredited survey that has surveyed over 6 million youth across the US and world

Search INSTITUTE

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PURPOSE

- The Attitudes and Behaviors (A&B) Survey gives a snapshot of the current experiences and perspectives of the youth in our community.
- It emphasizes the strengths and supports youth currently have and need, and how those positive indicators protect against youth risk behaviors.

Search INSTITUTE

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WHO IS SURVEYED?

Southington students enrolled in grades 7, 9 & 11

- Survey was taken on February 23, 2022.
- 1312 students completed.
- 85% completion rate
  - 85 students absent that day
  - 5 student opt outs
  - 98 surveys eliminated for non-completion, missing data, filling in patterns or selecting a grade that was not being surveyed

It is important to note that the rate of our surveys that were discarded is 7% and the national average is between 15%-25%. This shows our students take the survey seriously.

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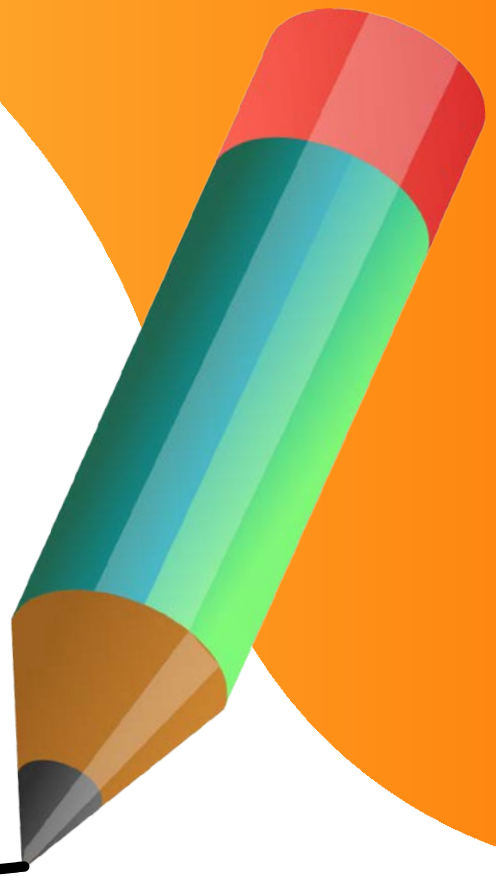
WHAT DO WE ASK ABOUT?

- 40 Developmental Assets
- Risk-taking Behaviors
- Four Core Measures: ATOD (Alcohol, Tobacco, Cannabis & Rx)
  1. Past 30-day use
  2. Perception of harm
  3. Perception of Parental Disapproval
  4. Peer perception of harm



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RISK-TAKING BEHAVIORS – Include but not limited to:

1. Substance Use or Misuse
2. Sexual Activity
3. Violent Behavior
4. Self-harm or Self-injurious Acts

WHAT DID WE FIND?

WOW!

HOORAY!

OH NO!

I WONDER…

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WOW!

noteworthy

1 **76%** of students surveyed feel their family supports them.
2020 survey = 80%

2 **Only 36%** of Southington youth surveyed report having positive self-esteem:
2020 survey = 45%

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HOORAY!

1. **84%** of students surveyed feel they have **positive peer influences** (highest external asset).
   2020 survey = 83%
2. **15%** of students **read for pleasure.**
   2020 survey = 11%
3. **School engagement** has jumped from **38% to 79%,** as reported by the students that completed the survey!
   2020 survey = 38%

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OH NO!

Only 19% of Southington students surveyed feel valued by the community.

2020 survey = 23%

***Adults make me feel important**

***Adults listen to what I have to say**

***I feel like I matter to adults**

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OH NO!

Suicide Awareness and Prevention

11% of 7th graders = **57** STUDENTS
2020 = 11%

14% of 9th graders = **71** STUDENTS
2020 = 15%

17% of 11th graders = **90** STUDENTS
2020 = 13%

Reported they have attempted suicide.

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OH NO!

Suicide Awareness and Prevention

Question on the survey:

Have you ever tried to kill yourself?

Response choices:

NO

Yes, once

Yes, twice

Yes, more than two times

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STEPS
www.southingtonsteps.org

NATIONAL SUICIDE PREVENTION LIFELINE™
1-800-273-TALK (8255)
suicidepreventionlifeline.org

24% of student respondents felt sad or depressed in the last month.

2020= 22%

All of the time = 6%

Most of the time = 18%

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I WONDER…

1 Students surveyed reported a high perception of parental disapproval of alcohol use, yet 54% are reporting they get alcohol at home with parental permission.

2 Why do older students tend to report having fewer assets than younger students? What assets start to drop off and when?

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Next STEPS

- STEPS Board and data evaluator continue to look at data
  - Pull-out high-risk groups
- Present to the Southington Community
- Structure programs for positive youth development and reduction of substance use
- Prevention in education: Grades K-12
  - New curriculum roll out for fifth grade in September 2022

How YOU can help:

- **Every person** in the Southington Community is an **Asset Builder!**
- **Family Support:** set aside time during the week to spend 1:1 time with the kids in your life – taking interest in their activities and talking about feelings.
- **Reading for Pleasure:** library cards for everyone in the family, read aloud to younger children.
- **Self-esteem:** praise kids for achievements. Help young people learn to accept themselves.
- **Community Values Youth:** ask your kids their input on current events. Take time to listen to young people and validate their thoughts & feelings.

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How YOU can help:

- Visit our website and sign up for the STEPS monthly newsletter.
- Subscribe to our social media.

www.southingtonSTEPS.org

LET'S TALK ABOUT IT!

Please join us for coffee and a conversation!

Saturday, June 4, 2022
9am-11am
Calendar House

Southington's Town-Wide Effort to Promote Success
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The minutes presented within this 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 www.southingtonschools.org. These minutes are considered a draft until approved at the following regular Board of Education meeting.

SOUTHINGTON BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT
REGULAR MEETING

MARCH 24, 2022

The regular meeting of the Southington Board of Education (Committee of the Whole - Operations) was held on Thursday, March 24, 2022, at 7:00 p.m. as a public meeting in the John Weichsel Municipal Center Public Assembly Room, 200 North Main Street, Southington, Connecticut with an Executive Session preceding at 6:00 p.m.

1. CALL TO ORDER

Mrs. Colleen Clark, Chairperson, called the meeting to order at 6:09 p.m.

Board members present were Mrs. Dawn Anastasio, Mr. Joseph Baczewski, Mrs. Terri Carmody, Mr. Sean Carson, Mr. James Chrzanowski, Mrs. Colleen Clark, and Mr. Jasper Williams. Absent were Mr. James Chrzanowski, Mr. David Derynoski and Mr. Zaya Oshana.

Cabinet administrators present were Mr. Steven Madancy, Superintendent of Schools, and Mr. Frank Pepe, Assistant Superintendent. Also present: Mrs. Sherri DiNello, Consultant *(left Executive Session at 6:44 p.m.).*

2. EXECUTIVE SESSION – Unaffiliated Compensation, UPSEU Contract Negotiations, Legal Matter (Attorney-Client Privileged Communication) and Student Matters

MOTION: by Mrs. Anastasio, seconded by Mrs. Carmody:

> **"Move to go into Executive Session, excluding the public and the press, for the purpose of discussing Unaffiliated Compensation, UPSEU Contract Negotiations, Legal Matter (Attorney-Client Privileged Communication) and Student Matters, and upon conclusion reconvene to public session."**

Motion carried unanimously by voice vote.

Mrs. Clark ended Executive Session at 6:58 p.m.
The Regular Board Meeting was reconvened at 7:09 p.m.

3. RECONVENE MEETING – REGULAR SESSION

Board members present were Mrs. Dawn Anastasio, Mr. Joseph Baczewski, Mrs. Terri Carmody, Mr. Sean Carson, Mr. James Chrzanowski, Mrs. Colleen Clark, and Mr. Jasper Williams. Absent were Mr. David Derynoski and Mr. Zaya Oshana.

Cabinet administrators present were Mr. Steven Madancy, Superintendent of School, and Mr. Frank Pepe, Assistant Superintendent.

Student Representatives present were Jhalissa Vincent, Ethan Solury, and Angelina Micacci.

4. PLEDGE OF ALLEGIANCE & NATIONAL ANTHEM

The student representatives led in reciting of the Pledge of Allegiance followed by Southington High School student Logan Gillis who sang the National Anthem and received standing applause.

5. CELEBRATION OF EXCELLENCE

For the Celebration of Excellence, Mr. Michael Crocco, SHS Principal, introduced Mrs. Kari Peschel-Luise, SHS teacher, who gave a brief summary of the STEM (Science, Technology, Engineering & Math) and Project Lead-the-Way programs and outlined the achievements in these fields by SHS student Alisha Paul who won the 2022 Connecticut NCWIT (National Center for Women and Information Technology) Award for Aspirations in Computing. Mrs. Peschel-Luise gave a brief summary of the Architectural Independent Study Program and the accomplishments of SHS student Jillian Christensen in this program who won the 2022 Student Design Competition - Home Builders and Remodelers Association of Central Connecticut with her 2000 square foot residence model. Mrs. Clark presented the students with a Certificate of Excellence.

Mrs. Clark called for a short recess 7:19 p.m. - 7:23 p.m.

MOTION: by Mr. Baczewski, seconded by Mr. Williams:

"Move to add Agenda Item 11.g 'Student Expulsion 2021-22-05' to the agenda."

Motion carried unanimously by voice vote.

MOTION: by Mr. Chrzanowski, seconded by Mr. Baczewski:

"Move to add Agenda Item 8.c.1 'Bid Award 2022-10 for Lawn Mowing & Trimming Services and Fall/Spring Debris Clean-up and Removal Services' and add Agenda Item 8.c.2 'Preschool Regular Education Rates for 2022-2023' and Agenda Item 8.c.3 'YMCA Before & After Care Program Rates 2022-2023'."

Motion carried unanimously by voice vote.

6. APPROVAL OF MINUTES

a. February 24, 2022 Meeting

MOTION: by Mrs. Carmody, seconded by Mr. Baczewski:

"Move to approve the Regular Board of Education Minutes of February 24, 2022, as submitted."

Motion carried unanimously by voice vote.

7. PUBLIC COMMUNICATIONS

a. Communications from Student Board Representatives

Angelina Micacci reported on the following:

- Juniors are scheduled to take the SATs March 23-31. The College Board has changed the way the SATs are administered.
- Juniors and Seniors take their seal of Bi-Literacy exams starting on Monday and continuing through the first week of April. It is a four-part exam including reading, writing, speaking, and listening to display the student's comprehension of their language.
- The Junior Prom will be held April 2, 2022 at La Bella Vista in Waterbury. The prom packet is available on the SHS website.
- The third quarter is ended on April 1, 2022 at the high school.
- The SHS Drama Club performed "Little Mermaid" on March 4 & 5.
- Unified Theatre was held on Friday, March 18. As co-director, she thanked Mrs. Cavanaugh, SHS teacher and advisor, and all those who helped and attended the show.

Ethan Solury reported on the following:

- The Unified Sports Tournament was held in the West Gym at SHS. Southington hosted Meriden, Middletown, and Simsbury.
- Seniors have been committing to colleges the past few weeks. He recognized Jhalissa Vincent for receiving a full tuition scholarship to Fordham University and Taylor DePaolo for receiving a full tuition scholarship to the University of Hartford.
- The SHS Robotics CyberKnights Team 195 attended their first competition in Springfield, Massachusetts and overcame initial learning curves to end the competition as a finalist and move on to their next competition in Hartford April 8 and 9.
- Derynoski School held a contest to name their dragon mascot and the name that won was "Walter". Derynoski held a scavenger hunt to see how many "Walter" dragons each class could find around the building. The winning class received games for indoor recesses.

Jhalissa Vincent reported on the following:

- Spring sports athletic season tryouts started last Saturday, March 19 and end later this week. The Spring Sports "Meet the Blue Knights Sports Teams' event was held on Wednesday evening, March 23 at SHS.
- She reported on the winter athletic sports season and the following teams that won CCC Conference Championships: Gymnastics, Girls Basketball, Boys Swimming and Diving, and Cheerleading,
- The Girls Ice Hockey Team advanced to the state semi-finals for the first time.
- Middle Schools: Tickets are available in the main offices at Kennedy and DePaolo for the Drama Club production of "School of Rock". Tickets cost $5 for students and $8 for adults. Show dates are April 1, 2, 7, and 8 at SHS at 7:00 p.m.

- On March 4, Jackson Laboratories recognized seventh grade student Alison Zijack in their "Stand Up for STEM" mentorship award ceremony held virtually for Northeast America. She received the "Youth in Action" award. Alison has been coding since she was eight years old and is now mentoring others.
- On March 2, 3, and 4, each grade 7 social studies class experienced Paul Vivian and Rev. Audley Donaldson's Diversity Awareness program.
- There are flags on display in the DePaolo Middle School lobby of the countries where each DePaolo student was born.

b. Communications from Board Members

Mrs. Carmody praised the Unified Sports Basketball Tournament event, and everybody involved in putting the program together.

Mr. Baczewski commented on the walk-through of the SHS sports complex facility. He thought that it was important that the Board do all that they could to rehab the sports complex.

Mr. Baczewski noted the number of residents who signed up for Public Communications and asked everyone to be understanding, kind, supportive, and learn from one another even if they disagree.

c. Communications from Administration

Administration reported on the following:

1. Last Day of School: Mr. Madancy announced that currently the last day of school is Monday, June 20 and high school graduation was set for Friday, June 17, 2022. If there were no more snow days, he may recommend, at another Board meeting, to have the last day of school for all students on Friday, June 17 so students do not have to return to school on Monday. By state law, schools must be in session 180 days and Southington is in session 181 days.
2. Rolling Back of Mitigation Strategies: Mr. Madancy explained that he has sent out correspondence regarding rolling back mitigation strategies because COVID case rates remain low, and he hopes that the re-emergence of variants in China and Europe does not impact the United States. Southington students are currently able to eat at tables in the cafeteria in one location instead of multiple locations. Livestreaming has also been rolled back. He noted that the teachers had been heroes throughout the pandemic and applauded them for their efforts the past couple of years.
3. DECA - States: Mr. Madancy announced that DECA had seven students qualify at the state level and would be sending 10 students to Atlanta, Georgia on April 22 for the National level of competition
4. SEF Gala: Mr. Madancy announced that the Southington Education Foundation Gala fundraiser will be held on Saturday, May 7, 2022, from 6:00-10:00 p.m. in the Pavilion at the Back Nine at the Southington Country Club. The SEF are ambassadors for the Southington Public School students.
5. Kindergarten Information Session: Mr. Pepe reported that Kindergarten registration started with an informational night on February 28 at DePaolo with all the elementary administrators and Mrs. Clark present along with community partners. The National Junior Honor Society students helped families navigate the sign-in and intent to enroll forms. Two Kindergarten teachers Beth Bowman and Angela Weaver presented "A Day in the Life of a Kindergartener."

6. Unified Sports Event on March 16: Mr. Pepe reported that the event was a huge success and praised the head coach Lisa Carmody and assistant coaches Denise Ingriselli, and Andrew Larkin. He noted that SHS Athletic Director, Steve Risser, was the Master of Ceremony for the event. Mr. Pepe read a letter that was received from the Associate Director, John Niski, of the Unified Sports Tournament program praising Southington for hosting a "class act" event and looked forward to Southington hosting more Unified events. Mr. Pepe noted that Unified Theatre was held on Friday, March 18 with 62 cast and 11 backstage crew members participating and Logan Gillis opening singing the National Anthem.

d. Communication from Public

Mrs. Clark read the Policy and Bylaw 9325 regarding public comments and clarified that it is not a question-and-answer session, not the time to make personal complaints and comments against staff or employees of the Board, and yielding time was not allowed. Due to the number of people who signed up to comment, Mrs. Clark was limiting the time allotted to three minutes, not five minutes. Emails would not be read into the record but would be available to Board members prior to the meeting.

There were a number of residents *(Attachment #1)* who came to the podium to voice their comments, recommendations, requests, and concerns regarding the following: Dumbing down of expectations and lowering of the bar for students, Socialism, Critical Race Theory, anti-Christian extremism, families divided; corruption in education, how bullying and harassment is handled, requesting resignations of some administrators and Board members, punishing the victim and not the perpetrator; requesting Board to help youth in town who are bullied, announcing the 10 new honorees for the Wall of Honor at Southington High School with the ceremony on May 5 at 6:00 p.m. *(Attachment #2);* requesting support for LGBTQ+ students starting in middle school and GSA at SHS (Genders & Sexualities Alliances) and the LGBTQIA+ community at large to raise awareness of substance misuse and mental health issues, suicide statistics and homeless rates of LGBTQ+ students, need for anti-bullying and suicide workshops, starting GSA program in middle school; support for a school districtwide PRIDE day/week/month about acceptance; diversity, equity and inclusion; STEPS Survey given in 7, 9, 11 grades not being available to parents, lack of transparency, inappropriate personal questions on a recent STEPS survey regarding use of drugs, alcohol, sexual conduct, and social behavior administered to students as young as 10 years old without parental permission; survey perverting and damaging young children, requesting having material that are not academically related available to parents on the SPS website for a parent to check to opt out, parents becoming distrustful of government and schools on what is being taught; parent thanking STEPS for the survey because education is more than academics and is also about learning social and emotional values and life skills; invitation from the Barnes Committee for BOE to visit the Barnes Museum, passing away of Southington Public Schools 16 year old student RJ Thomas who had a debilitating disease and a thank you from his parents to his teachers; PRIDE curriculum, turning back to God for resolutions; proud of LGBTQ+ students who came forward and spoke of their struggles; inappropriateness of student being approached by PRIDE organization member to become an activist and to speak at this BOE meeting without parent permission first; moral issues should be taught at home, not in school; UNICO fully funds and supports the Southington Public Schools Unified sports and other activities.

Mrs. Clark called for a recess at 8:41 p.m.
Mrs. Clark reconvened the regular meeting at 8:50 p.m.

8. COMMITTEE REPORTS

a. Policy & Personnel Committee Meeting – March 2, 2022

Mr. Williams reported that the committee discussed the revisions of the job descriptions for the School Nursing Supervisor, Information Technology Secretary, and the Technology Secretary that were last revised in 2006 and would be presented later on the agenda for action. The committee also discussed and were updated on the implementation of Capstone at Southington High School this year. The administration will continue to monitor the time needed to oversee student progress and will return to the committee next year with further recommendations regarding Capstone.

b. Curriculum & Instruction Committee Meeting – March 11, 2022

Mr. Baczewski reported that the committee discussed and received an overview of the three (3) Grade 2 Science Units. Mrs. Carmody noted that the third unit on Beavers was very illuminating and that she and Mrs. Anastasio learned something new. The committee also received an update from the J. F. Kennedy Middle School administration on the Intervention Block pilot that was approved last year. J. A. DePaolo Middle School will institute a version of the intervention block model during the third trimester this year.

c. Financial Committee Meeting – March 22, 2022

Mr. Chrzanowski reported that the committee met and discussed the following recommendations.

MOTION: by Mr. Chrzanowski, seconded by Mr. Williams:

> **"Move to award Bid 2022-10, Lawn Mowing & Trimming Services and Fall/Spring Debris Clean-up and Removal Services at the eight (8) school sites to the vendors as presented by administration."**

Motion carried unanimously by voice vote.

MOTION: by Mr. Chrzanowski, seconded by Mrs. Carmody:

> **"Move to approve keeping the 2022-2023 Preschool Tuition Rates the same as the 2021-2022 school year, as presented."**

Motion carried with Mrs. Clark abstaining.

MOTION: by Mr. Chrzanowski, seconded by Mr. Carson:

> **"Move to approve the 2022-2023 YMCA Lease Rates, as presented."**

Motion carried with Mrs. Clark abstaining.

Mr. Chrzanowski reported that the committee received an update on the recent increase in claims paid through the Self-Insurance fund December 21-February 22.

9. SUPERINTENDENT'S REPORT

a. Personnel Report

MOTION: by Mr. Carmody, seconded by Mr. Baczewski:

"Move to approve the Personnel Report, as presented.

Motion carried unanimously by voice vote.

10. OLD BUSINESS

a. Town Government Communications

Mrs. Clark reported that there was a walk-through of the Southington High School Athletic Complex on Wednesday, March 23 with members of the Board of Education, Board of Finance and Town Council. Mr. Madancy stated that if anyone wanted to take a tour of the complex to see what needs to be done, they could contact Mr. Crocco, SHS Principal, Mr. Risser, Athletic Director, or Mr. DiNello, Associate Athletic Director. Mr. Baczewski questioned about the cracks in the Tennis Courts.

b. Policy 3542.1 – Purposes and Facilities – Food Service – Policy Revision – Second Reading

MOTION: by Mr. Williams, seconded by Mr. Baczewski:

"Move to approve Policy 3542.1 – Purposes and Facilities – Food Service."

Motion carried unanimously by voice vote.

c. Policy 5145.3 – Sexual Harassment of Students – Policy Revision – Second Reading

MOTION: by Mr. Williams, seconded by Mr. Baczewski:

"Move to approve Policy 5145.3 – Sexual Harassment of Students."

Motion carried unanimously by voice vote.

d. Science – Grade 1 Units – Second Reading

MOTION: by Mr. Baczewski, seconded by Mr. Williams:

"Move to approve the Grade 1 Science Units second reading."

Motion carried unanimously by voice vote.

e. Library Media Proposal for Grades 3-5 – Second Reading

MOTION: by Mr. Baczewski, seconded by Mr. Carson:

"Move to approve the Library Media Proposal for Grades 3-5, second reading."

Motion carried unanimously by voice vote.

11. NEW BUSINESS

a. Leonard & Gladys Joll Scholarship Recipient

Mrs. Clark explained that the name of the recipient would be revealed on Scholarship Night at SHS.

MOTION: by Mrs. Carmody, seconded by Mr. Carson:

"Move to approve the recipient recommended by the Leonard & Gladys Joll Scholarship Committee."

Motion carried unanimously by voice vote.

b. Approval of Job Descriptions – School Nursing Supervisor, Information Technology Secretary, and Technology Secretary

MOTION: by Mr. Williams, seconded by Mrs. Carmody:

"Move to approve the job descriptions for the School Nursing Supervisor, Information Technology Secretary and Technology Secretary."

Motion carried unanimously by voice vote.

c. Science – Grade 1 Units – First Reading

This was a first reading and would become before the Board at their next meeting for action.

e. 2022-2023 Healthy Food Certification

MOTION: by Mr. Chrzanowski, seconded by Mrs. Carmody:

"Pursuant to C.G.S. Section 10-215f, the Board of Education or governing authority certifies that all food items offered for sale to students in the schools under its jurisdiction, and not exempted from the Connecticut Nutrition Standards published by the Connecticut State Department of Education, will comply with the Connecticut Nutrition Standards during the period of July 1, 2022, through June 30, 2023. This certification shall include all food offered for sale to students separately from reimbursable meals at all times and from all sources, including but not limited to school stores, vending machines, school cafeterias, culinary programs, and any fundraising activities on school premises sponsored by the school or non-school organizations and groups."

Motion carried unanimously by voice vote.

f. 2022-2023 Food and Beverage Exemption

MOTION: by Mr. Chrzanowski, seconded by Mrs. Carmody:

"The Board of Education or governing authority will allow the sale to students of food items that do not meet the Connecticut Nutrition Standards and beverages not listed in Section 10-221q of the Connecticut General Statutes provided that the following conditions are met: 1) the sale is in connection with an event occurring after the end of the regular school day or on the weekend; 2) the sale is at the location of the event; and 3) the food and beverage items are not sold from a vending machine or school store. An "event" is an occurrence that involves more than just a regularly scheduled practice, meeting, or extracurricular activity. For example, soccer games, school plays, and interscholastic debates are events but soccer practices, play rehearsals, and debate team meetings are not. The "regular school day" is the period from midnight before to 30 minutes after the end of the official school day. "Location" means where the event is being held and must be the same place as the food and beverage sales."

Motion carried unanimously by voice vote.

g. Student Expulsion

MOTION: by Mr. Baczewski, seconded by Mr. Williams:

"Move to expel Student 2021-22-05 as recommended by administration."

Motion carried with Mr. Chrzanowski abstaining.

12. ADJOURNMENT

MOTION: by Mrs. Anastasio, seconded by Mr. Baczewski:

"Move to adjourn."

Motion carried unanimously by voice vote.

The meeting adjourned at 9:13 p.m.

Respectfully submitted,
Linda Blanchard
Recording Secretary

ATTACHMENT #1 – PUBLIC COMMUNICATIONS

Southington Board of Education
PUBLIC COMMUNICATION
MARCH 24, 2022

	NAME	ADDRESS	TOPIC
1	Pat Tavalloz		
2	Bob Brown	587 Burritt ST	Well of Hope
3	Shawn Irwin	32 Vernon ave	Bullying
4	Riley Irwin	32 Vernon ave	Bullying
5	James Irwin	34 Vernon ave	Bullying
6	Michael Tkaczynski	27 Hitching Post Dr.	Chps Survey
7	Regina Guiello	12 Beaver St.	Pride Curriculum
8	Lisa Mason	66 Hobart St.	PRIDE Awareness
9	Susan Zabchenski	28 Worthing	Policy
10	Kelly Dano	4 Lothian	Lgbtq education
11	Steven Bialkowski	191 Queen Street	CRT / Policy
12	Missy Giovanello	491 Queen street	Items
13	Cynthia Herron	908 Main St	Educators
14	Rich Rice	11 Cowles Ave	Survey - Illegal
15	CHRISTOPHER MCKEE	16 POSTMAN HWAY MARION	SUPPORTING PRIDE
16			

great together

NAME	ADDRESS	SUBJECT
Steve Nicoll	209 Hilltop Dr. Southington	Support for Pride Club
Katie Soltys	175 Berlin Ave. Southington	Support for Pride & N & R. Th
Sophia Swanson	40 White Oak Dr. Southington	
Gabriella Bruce	160 Bellevue Ave, Southington	Support for lgbtq+ youth
ROBERT Tower	106 Hillside Dr Plainville	UNICO
Wendy Fischer	482 South End Rd	LGBTQ

ATTACHMENT #2 – PUBLIC COMMUNICATIONS

(2)

Wall of Honor Announcement—March 24, 2022

Bob Brown, 587 Burritt St. I am here tonight to announce our new honorees for our Southington High School Wall of Honor.

First, let me explain when we will have our ceremony. We will induct these people on May 5 at 6 pm in the high school auditorium. We had planned a gala event at the Aqua Turf for April 26, but several months ago, with Covid numbers still high, we decided to postpone that—it probably will be held next fall.

Let me also thank the committee members—Terri Carmody, Frank Pepe and Chris Palmieri have been a great help attending meetings, as well as Karen Avitable, Miclele Zommer, Vicki Triano, Chris Poulos and Art Secondo giving input.

We have ten new inductees, covering the last three years. More extensive biographies will be included in our press release soon.

First group starts with Cara Belvin, whose mother had cancer growing up, and who started a now nationally recognized organization to help girls growing up in that situation.
Second we have Sandra and Gino Brino, well known I am sure to most people. They are responsible for building our WORLD class and famous Robotics team.
Third from two years ago is Rob Dibble, who achieved fame as a hard-throwing relief pitcher for the Cincinnati Reds and has gone on to become a national known radio sportscaster at ESPN.

Then from last year we have Kevin Altieri, an animator and cartoonist in California, Ken DiMauro, longtime town historian, John Gasecki, former principal of SHS and veteran of WW II, and Kristen Guida, decorated practicing nurse, humanitarian and college teacher of nursing.

And for this year we have John DeMello, veteran and longtime advocate for veterans in our town, and Joseph Tranquillo, Associate Provost for Transformative teaching and Learning at Bucknell University and published author.

We also will include more of our WW II soldiers who gave their lives for our country.

As I said, each of these has a much more extensive biography than I listed here. We hope everyone here will attend May 5—school officials, Bd of Ed and the public. We have amazing students from our schools who have gone on to accomplish great things. We should all be proud of them and our schools.

Board of Education

Administrative Report

April 28, 2022

1. NEASC visit
2. Elementary Robotics and CFGNB Grant
3. FBLA State Level Competition Results
4. Erin Caouette, Fund for Teachers Grant
5. UCONN ECE Growth Graph for SHS
6. SEF Gala

STEVEN G. MADANCY
SUPERINTENDENT OF SCHOOLS

FRANK M. PEPE
ASSISTANT SUPERINTENDENT OF SCHOOLS

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SOUTHINGTON PUBLIC SCHOOLS

Board of Education
Southington, Connecticut
Policy & Personnel Committee Meeting Minutes
Wednesday, April 20, 2022 - 5:30pm
Technology Training Lab – Municipal Center Assembly Room

Members Present: Committee Chair Jasper Williams, Dawn Anastasio, David Derynoski
Members Absent: Zaya Oshana

The meeting was called to order by Chairman Jasper Williams at 5:31 PM.

Proposed revisions for Policy 4118.4 - Staff Ethics – Suggested additional language was discussed and agreed upon. Verb tense changes were reviewed and accepted. Recommendation for First Read.

Policy 4118.5 - Acceptable Computer, Network, and Internet Use – Current policy was reviewed along with two sample policies. Chairman Jasper Williams suggested reviewing samples from surrounding Towns, as he researched Wallingford and Berlin and suggested there may be value combining 4118.7 with 4118.5. Potential alterations will be discussed during the May 11, 2022 meeting.

Policy 4118.10 - Misconduct of Staff Members – A sample comparison policy was reviewed alongside Southington's current policy. The recommendation is to keep current policy.

Proposed revisions for Policy 5121 - Examination/Grading/Rating – No policy changes suggested. Regulation updates were shared. The updates better reflect current practice and organization of grade report calendars.

Proposed revisions for Policy 5145.2 - Freedom of Speech/Expression – Current policy compared to sample. Suggested revision updates language to reflect not just printed material. Recommended first read.

Proposed revisions for Policy 6162 - Care of Instructional Materials – Current policy reviewed. Suggested updates address student technology issued by the district and changes to the associated regulations which prescribe accountability for student care of devices issued by the district. Recommended first read.

Mr. Derynoski requested a review of policies related to cycle replacement of technology. This information will be presented at the May 11th meeting.

The meeting was adjourned at 5:55 PM.

Respectfully Submitted,

Frank Pepe

CERBOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ Board Meeting Date April 28, 2022

Decision Requested X Agenda Code 10 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 2021-2022 school year. This report includes activity for the month of March 2022.

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

Peter Madaras
Signature of Superintendent

Included:
Personnel Report
Agenda –March 2022

Personnel Report
March 2022

APPOINTMENTS

	NAME	POSITION	SCHOOL	FTE	EFFECTIVE	DEGREE	SALARY
CERT	Bardes, Erica	Social Studies	JAD	1.0	2-22-2022	BA	$48,462
CLASS	Beaudoin, Richard	Crossing Guard	HES	.20	3-17-2022	N/A	$18.63
CLASS	Garcia Rosas, Alberto	Custodian	KSA	.50	3-22-2022	N/A	$15.63
CLASS	Groll, Nicole	ABA Therapist	HES	1.0	3-18-2022	N/A	$17.67
CERT	Hughes, Julie	Math Teacher	SHS	1.0	4-18-2022	MA	$92,181
CLASS	Olsen, Dean	Custodian	SHS	.50	3-29-2022	N/A	$15.63

RESIGNATIONS/RETIREMENTS

	NAME	POSITION	SCHOOL	EFFECTIVE	YRS	RET/RES
CLASS	DiCaprio, John	Crossing Guard	HES	3-17-2022	20	RETIRE
CLASS	DiLorenzo, Michael	Tech Assistant	District	3-10-2022	3	RESIGN
CERT	Gilbertie, Rachel	Teacher/English	SHS	6-30-2022	16	RESIGN
CLASS	Iverson, Linda	Secretary, Class I	SEES	6-30-2022	28	RETIRE
CLASS	Martinelli, Deborah	Paraeducator, FT	SHS	4-4-2022	6	RETIRE
CLASS	McEwen, Paul	Custodian, PT	SHS	4-1-2022	3	RESIGN
CLASS	Santiago, Dyana	Paraeducator, PT	JAD	2-24-2022	2 mo.	RESIGN
CLASS	Sinnott, Kevin	Paraeducator, FT	SHS	2-10-2022	3 mo.	RESIGN
CLASS	Truss, Robin	Paraeducator, FT	JAD	6-30-2022	21	RETIRE
CLASS	Vecchio, Gina	Paraeducator, FT	JAD	4-2-2022	23	RETIRE

ASSIGNMENT CHANGE

	FROM (PREVIOUS ASSIGN)		TO (NEW ASSIGN)		
NAME	POSITION/SCHOOL	FTE	POSITION/SCHOOL	FTE	EFFECTIVE
Burkell, Scott	Asst. softball coach	SHS	Freshman softball coach	SHS	3-19-2022
DeLaRosa, Richard	Custodian, PT	SHS	Custodian, FT	SHS	3-25-2022
Dube, Rachel	Freshman softball coach	SHS	Asst. softball coach	SHS	3-19-2022
Theriault, Teddy	Custodian, FT	SHS	Custodian, FT	SEES	3-15-2022

TRANSFERS

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

None to report

COACHING / STIPENDS

Coaching Stipends

Emery, Emily	Asst. cross country coach	JAD	RESIGN
Laudati, Courtney	Girls' soccer coach	JAD	STIPEND
Palmieri, Kevin	Girls' asst. tennis coach	SHS	RESIGN

Other Stipends

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** **April 28, 2022**

Decision Requested X **Agenda Code** **11 b.**

AGENDA REPORTING FORM

Agenda Topic: Science – Grade 2 Units - Second Reading

Summary of Issue: The Curriculum & Instruction Committee has reviewed Science – Grade 2 Units

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: The Board of Education Curriculum & Instruction Committee is bringing the Science – Grade 2 Units to the full Board for a Second Reading.

Titles of Attachments:

1. Course Proposal

Signature of Staff Member Submitting Report

Signature of Superintendent of Schools

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Unit 1 - 4th Little Pig

This unit works under the umbrella of a design problem. Students will plan for and construct the 4th Little Pig's shelter. Students will need to consider the types, changes relative to temperature, and properties of matter in order to construct their final design. Each learning sequence provides students with additional insight in regard to matter and its properties.

To access the flowchart for this unit, click here.

Suggested Pacing:
9.5 - 10.5 hrs

Anchoring Phenomenon/Design Problem:
Design Problem-The 4th Little Pig's House

Unit Driving Question:
What materials are best suited to design a home for the 4th Little Pig?

Culminating Performance Task:
Design, build and test a house for the 4th Little Pig.

NGSS Performance Expectation(s): (Hyperlinks will bring reader to NGSS Evidence Statements)

- 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
  - [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]
- 2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for the intended purpose.*
  - [Clarification Statement: Examples of properties could include strength, flexibility, hardness, texture, and absorbency.]
  - [Assessment Boundary: Assessment of quantitative measurements is limited to length.]
- 2-PS1-3: Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
  - [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]
- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Three Dimensions that form the Foundation for these NGSS Performance Expectations:

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Planning and Carrying Out Investigations • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. **Analyzing and Interpreting Data**	**PS1.A: Structure and Properties of Matter** • Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.	**Patterns** • Patterns in the natural and human designed world can be observed. **Cause and Effect** • Simple tests can be designed to gather evidence to support or

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• Analyze data from tests of an object or tool to determine if it works as intended. **Constructing Explanations and Designing Solutions** • Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. **Asking Questions and Defining Problems** • Ask questions based on observations to find more information about the natural and/or designed world(s). • Define a simple problem that can be solved through the development of a new or improved object or tool.	• Different properties are suited to different purposes. • A great variety of objects can be built up from a small set of pieces. **ETS1.A: Defining and Delimiting Engineering Problems** • A situation that people want to change or create can be approached as a problem to be solved through engineering. • Asking questions, making observations, and gathering information are helpful in thinking about problems. • Before beginning to design a solution, it is important to clearly understand the problem.	refute student ideas about causes. **Energy and Matter** • Objects may break into smaller pieces and be put together into larger pieces, or change shapes.

Possible Common Core State Standards Connections:

ELA/Literacy —

- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1)(2-PS1-2) (2-PS1-3)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1) (2-PS1-2)(2-PS1-3)(K-2-ETS1-1)
- RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2)
- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-PS1-2)(K-2-ETS1-1)
- MP.4 Model with mathematics . (2-PS1-1)(2-PS1-2) (K-2-ETS1-1)
- MP.5 Use appropriate tools strategically. (2-PS1-2)(K-2-ETS1-1)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1)(2-PS1-2)(K-2-ETS1-1)

PROGRESSION OF LEARNING

Learning Sequence 1

- **Learning Sequence Driving Question**
  - What materials are best suited to design a home for the 4th little pig?

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- Learning Sequence 1
- **Relationship to Anchoring Phenomena/Design Problem**
  - This is the introduction to the anchoring phenomenon.
- **Student Expected Outcomes:**
  - Students will explore materials available to build a house for the 4th Little Pig.
  - Students will create an initial plan for the 4th Little Pig's house.

Learning Sequence 2

- **Learning Sequence Driving Question**
  - How do you sort and classify objects based on their properties?
- Learning Sequence 2
- **Relationship to Anchoring Phenomena/Design Problem**
  - Students understand that the materials they will use to build the 4th Pig's house have observable properties of matter, and that these observable properties can help students select the appropriate materials needed to withstand the challenges of the wolf (wind) and weather (rain).
- **Student Expected Outcomes:**
  - Students will be able to sort a variety of objects by their various properties and describe how and why they sorted the objects the way they did.
  - Students will classify objects as solids and liquids based on the properties of matter they observed.

Learning Sequence 3

- **Learning Sequence Driving Question**
  - What happens when materials are heated or cooled?
- Learning Sequence 3
- **Relationship to Anchoring Phenomena/Design Problem**
  - Students will understand that changes in matter can affect the integrity of a structure and that temperature can affect the state of matter. Therefore choosing materials that will not change state in hot or cold weather will be necessary to the function of the designed product.
- **Student Expected Outcomes:**
  - Students will be able to describe and explain how temperature affects different types of matter.

Learning Sequence 4

- **Learning Sequence Driving Question**
  - Why are different materials better suited for certain purposes than others?
- Learning Sequence 4
- **Relationship to Anchoring Phenomena/Design Problem**
  - Students understand that different materials are better for different purposes. The materials the students select in the final pig shelter design have to meet the intended goals of withstanding a hot summer day and a big storm (wind and rain)
- **Student Expected Outcomes:**
  - Students will investigate a variety of materials and test their durability.
  - Students will construct a physical model of a bridge out of chosen materials in order to hold as much weight as possible and meet an intended purpose.

Learning Sequence 5

- **Learning Sequence Driving Question**

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- How can objects be made and remade into new objects using existing pieces?

- Learning Sequence 5
- **Relationship to Anchoring Phenomena/Design Problem**
  - Students will understand how a material can be repurposed and used to construct a new and complete object. Students will have to consider how they will repurpose and combine items to build the 4th little pigs home to meet specific requirements.
- **Student Expected Outcomes:**
  - Students will describe how different structures can be assembled and reassembled into new structures using the same objects.
  - Students will describe how the structures are similar and different from the original structure.

Assessments:

- Culminating Performance Task
  - Design, build and test a house for the 4th Little Pig.

- Grade 2 Performance Expectation Rubrics and Prompts
- Elementary Assessment Resource

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials
- EPIC! Digital Library - G2 U1 List
  - Includes ebooks and videos
  - Must have an educator user account for free access

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Learning Sequence 1

Brief Description:
This unit works under the umbrella of a design problem, and Learning Sequence 1 is the introduction to that problem. Students explore materials and draw an initial model of their idea for their 4th Little Pig's house.

Suggested Pacing:
0.75 - 1.25 hrs

Lesson-Level Phenomenon/Design Problem:
The Big Bad Wolf is back to his old ways. A new little pig has moved into town. She needs a shelter because a big summer storm is coming. She has heard about the story of the Three Little Pigs and is worried. There are no more bricks available in town. Using the materials available in town (our classroom), how would you build a house to keep the new pig safe from the wolf and the weather (hot summer temperatures, wind, water)?

Relationship to Anchoring Phenomena/Design Problem:
This is an introduction to the design problem.

Learning Sequence Driving Question:
What materials are best suited to design a home for the 4th Little Pig?

Student Expected Outcomes:

- Students will explore materials available to build a house for the 4th Little Pig.
- Students will create an initial plan for the 4th Little Pig's house.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Planning and Carrying Out Investigations* • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. **Asking Questions and Defining Problems*** • Ask questions based on observations to find more information about the natural and/or designed world(s). • Define a simple problem that can be solved through the development of a new or improved	**PS1.A: Structure and Properties of Matter *** • Different properties are suited to different purposes. **ETS1.A: Defining and Delimiting Engineering Problems*** • A situation that people want to change or create can be approached as a problem to be solved through engineering. • Asking questions, making observations, and gathering information are helpful in thinking about problems. • Before beginning to design a solution, it is important to	**Cause and Effect*** • Simple tests can be designed to gather evidence to support or refute student ideas about causes. **This element will only be partially met.*

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object or tool. **These elements will only be partially met.*	clearly understand the problem **These elements will only be partially met.*	

Related Performance Expectation(s) in this Unit:

- 2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.*
  - [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.]
  - [Assessment Boundary: Assessment of quantitative measurements is limited to length.]
- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Possible Common Core State Standards Connections:

ELA/Literacy —

- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1)(2-PS1-2)
- RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1)(2-PS1-2)
- MP.4 Model with mathematics. (K-2-ETS1-1)(2-PS1-2)
- MP.5 Use appropriate tools strategically. (K-2-ETS1-1)(2-PS1-2)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1)(2-PS1-2)

Possible Preconceptions/Misconceptions:

- Students need help in differentiating the properties that make up the object from the properties of the material the object is made from.
- Students will have a difficult time constructing a design to meet a specific function. Students will tend to build for aesthetics first.
- Matter is always small.
- Materials can only have properties of one state of matter.
- Gases are invisible.
- Air is not a gas.
- Air has no mass, it is light because we cannot see it, and air does not take up space.

Prior Student Knowledge:

N/A

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LESSON PLAN – 5-E Model - *LS1 is an incomplete 5-E model, as it is an introduction to the unit's design problem.*

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Read a traditional version of "The Three Little Pigs" to familiarize students with the story and to then be able to create a plan for a new house design.
    - The James Marshall version is an effective text to use because the images of the houses really shows the engineering design aspect which provides rich conversation about why the houses were either blown down or stayed up.
- Teacher will read the story and present the task of designing the 4th Little Pig's house.
    - The Big Bad Wolf is back to his old ways. A new Little Pig has moved into town. She needs a shelter because a big storm is coming. She has heard about the story of the Three Little Pigs and is worried. There are no more bricks available in town. Using the materials available in town (our classroom), how would you build a house to keep the new pig safe from the Wolf and the weather (wind, water)?

Resources:

- Read-aloud versions of *The Three Little Pigs* by James Marshall can be found on YouTube or epic! Books

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

- Students explore a variety of materials in small groups in order to decide what to use in their 4th Little Pig's house design.
    - Suggested materials needed for this learning sequence items such as sponges, paper towels, straws, popsicle sticks, clay, pencils, erasers, blocks.
    - Be sure to have a range of items with a variety of properties: shape, flexibility, absorbency, texture, durability/hardness, adhesiveness/stickiness)

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

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- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Students create an initial model of their design for the 4th Little Pig's house.
    - Use the *Pre-assessment Worksheet* - Version 1 **or** Version 2.
        - You may need to modify the *Pre-Assessment worksheet* to add or modify items depending on what you make available to students.
    - Instructions are given to the students detailing the parameters of the design, including using the presented materials to design a house that will withstand wind and water, as well as labeling the materials used.
    - Remind students that they will need to explain their reasoning for the material choices.
    - Teacher will collect and observe student sketches for possible misconceptions and background knowledge.
        - Save *Pre-assessment Worksheet* - Version 1 or Version 2 until the Culminating Performance Task. Students revise their designs at the end of the unit in order to build and test a physical model using available classroom materials.
- Students work together to create a design for a physical model (to be built at the close of the unit of study) of the 4th Pig's house using the pre-assessment sheet.
- Students justify why the materials were chosen.

Resources:

- Pre-assessment Worksheet -Version 1

or

- Pre-assessment Worksheet -Version 2

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: engineering, materials, structure, design, model, sketch

EVALUATE

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Formative Monitoring Description(s):

Formative monitoring will occur at various times (checks for understanding through questioning and discussion) throughout this learning sequence. Please note the following SEP, DCI and CCC need to be monitored throughout the learning sequence.

- ❏ **SEP:** *Planning and Carrying Out Investigations; Asking Questions and Defining Problems*
- ❏ **DCI:** *PS1.A: Structure and Properties of Matter; ETS1.A: Defining and Delimiting Engineering Problems*
- ❏ **CCC:** *Cause and Effect*

Summative Assessment Description(s):

- Introduce the *Summary Table*, and add to it after each learning sequence.

Resources:

- Summary Table

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Learning Sequence 2

Brief Description:
Given a selection of objects, students will conduct an investigation to describe and classify different kinds of materials by their observable properties.

Suggested Pacing:
2 - 2.5 hrs

Lesson-Level Phenomenon/Design Problem:
Object Sort Activity

Relationship to Anchoring Phenomena/Design Problem:
Students understand that the materials they will use to build the 4th Pig's house have observable properties of matter, and that these observable properties can help students select the appropriate materials needed to withstand the challenges of the wolf (wind) and weather (rain).

Learning Sequence Driving Question:
How do you sort and classify objects based on their properties?

Student Expected Outcomes:

- Students will be able to sort a variety of objects by their various properties and describe how and why they sorted the objects the way they did.
- Students will classify objects as solids and liquids based on the properties of matter they observed.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Planning and Carrying Out Investigations • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.	**PS1.A: Structure and Properties of Matter** • Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.	**Patterns** • Patterns in the natural and human designed world can be observed.

Related Performance Expectation(s) in this Unit:

- 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
  - [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]

Possible Common Core State Standards Connections:

ELA/Literacy —

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- RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-2)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-PS1-2)
- MP.4 Model with mathematics. (2-PS1-2)
- MP.5 Use appropriate tools strategically. (2-PS1-2)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-2)

Prior Student Knowledge:

N/A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Students are given an unlabeled, opaque box/bag containing a variety of classroom and household objects.
    - Objects may include: sponges, blocks, pencils, balloons, water bottle, cans of soda, syrup, shampoo, playdough, sand, etc.).
- Students work in small groups to sort the materials given into groups based on attributes. Students will explain their reasoning to the class.
- Prompt students: How can you sort and classify objects based on their characteristics (attributes)?
- Optional: Use *Object Sort* to digitally sort images into categories that make sense to students.

Resources:

- Object Sort

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

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EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

- *Prepare ice, water and air filled balloons ahead of time.* If there are latex allergies in your classroom, a non-latex glove works well.
- Groups of students are given three balloons; one containing ice, one with water and one with air. Using a Q-tip or soft blunted object, students will investigate the objects with this tool to discover more about the objects.
- Student groups complete the *Observation sheet.*

Resources:

- Observation sheet

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Class discusses their observations from both the balloon exploration and object classification.
- Class reads *Many Kinds of Matter: A Look at Solids, Liquids, and Gases* by Jennifer Boothroyd on epic! Books
- Students create anchor charts for: Solids, Liquids, and Gases.
    - The *Sample Anchor Chart* link below provides some ideas
- Teacher should facilitate and incorporate appropriate science terms into the discussion.

Teacher Resource:

- *Many Kinds of Matter: A Look at Solids, Liquids, and Gases* by Jennifer Boothroyd on epic! Books
- Sample Anchor Chart

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations

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- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: temperature, gas, solid, liquid, freeze, state, state of matter, change of state, weight, space (*volume), matter

ELABORATE (Applications / Extensions)

Activity Description:

- Students work in cooperative groups with the initial objects (from Engage activity) to design a way of classifying them by state of matter.
- Students complete the *Student Worksheet* and provide rationale for their classifications.
- Teacher verbally collects and graphically displays the class data to facilitate a class discussion about the students' findings (data and patterns observed)
- Based on the data, class creates a usable materials list for the construction of the 4th Little Pig's House.

Resources:

- Student Worksheet

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s):

Formative monitoring will occur at various times (checks for understanding through questioning and discussion) throughout this learning sequence. Please note the following SEP, DCI and CCC need to be monitored throughout the learning sequence.

- ❏ **SEP:** *Planning and Carrying Out Investigations*
- ❏ **DCI:** *PS1.A: Structure and Properties of Matter*
- ❏ **CCC:** *Patterns*

Summative Assessment Description(s)

- Students identify materials that may be used for developing the 4th pig's house AND can accurately identify the state of matter for that material.
- Students add to the Summary Table any new information.

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Resources:

- Summary Table

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Learning Sequence 3

Brief Description:
Students will observe changes of matter through media, experiments, or literature which involve temperature changes. As a supplemental activity, students will be given the task to change the shape of water and a piece of chocolate.

Suggested Pacing:
1 - 1.5 hrs

Lesson-Level Phenomenon/Design Problem:
What happens when materials are heated or cooled?

Relationship to Anchoring Phenomena/Design Problem:
Changes in matter can affect the integrity of a structure and that temperature can affect the state of matter. Therefore choosing materials that will not change state in hot or cold weather will be necessary to the function of the designed product.

Learning Sequence Driving Question:
What happens when materials are heated or cooled?

Student Expected Outcomes:

- Students will be able to describe and explain how temperature affects different types of matter.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Planning and Carrying Out Investigations ● Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.	**PS1.A: Structure and Properties of Matter** ● Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.	**Cause and Effect** ● Events have causes that generate observable patterns **Energy and Matter** ● Objects may break into smaller pieces and be put together into larger pieces, or change shapes.

Related Performance Expectation(s) in this Bundle:

- 2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
  - [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]

Possible Common Core State Standards Connections:

ELA/Literacy —

- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1)(2-PS1-2) (2-PS1-3)

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- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1) (2-PS1-2)(2-PS1-3)(K-2-ETS1-1)

Mathematics —

- MP.4 Model with mathematics. (2-PS1-1)(2-PS1-2) (K-2-ETS1-1)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1)(2-PS1-2)(K-2-ETS1-1)

Possible Preconceptions/Misconceptions:

- Students identify solids and liquids as different materials and do not realize that both states are matter.
- Young students have a difficult time differentiating objects from materials.
- Students need help in differentiating the properties that make up the object from the properties of the material the object is made from.

Prior Student Knowledge:

N/A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Show the *Melting Ice Cream Bar* to the students. Read the prompts to the students and allow them to discuss their ideas with their peers.
- Get the students thinking about what influences the changes in the state of matter and why some materials are affected while others are not. Please remember this is not the time to tell the students why this is happening.
    - The purpose of the Engage is to identify what students already know and to develop their curiosity.
- Prompt students to generate questions that they could investigate (based on their observations) to determine how the shape of some of the materials in the ice pop changed shape while others did not?
- Record student questions on chart paper or whiteboard. Lead students to develop questions that involve temperature.

Resources:

- Melting Ice Cream Bar

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

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Activity Description:

- Show students a ziplock bag containing 2 or 3 hershey kisses (unwrapped) and a second bag containing ½ cup of water.
- Students devise a plan with their peers to change the shape or state of the materials in the ziploc bags.
- Have the student groups complete an *Investigation Planning Sheet* prior to testing their ideas.
    - Do not distribute bags to students until they have devised a plan.
    - Explain that students are NOT allowed to open the bag at any time during the investigation!
- Students test their ideas and share their results with the class.
    - Teacher Note- you may want to pre-freeze a few bags of water in different shapes that you can distribute if needed, because some students may ask to freeze the water, this will delay the final discussion.
- You may want to allow students to access the states of matter anchor charts generated in Learning Sequence 2.

Resources:

- Investigation Planning Sheet

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Discuss student results during the exploration with water and chocolate. During this discussion, lead the students to understand that liquids can change their shape by changing their container or by changing the temperature.
    - The water could have been frozen into different shapes or placed in a container causing the shape of the water to take the shape of the new container.
    - For the chocolate, a solid, students must realize that to change the shape of the chocolate they need to change the temperature of the chocolate to get it to melt and become more malleable. Help students to understand that different materials change their state at different temperatures. You can use a demonstration with an ice cube and a piece of chocolate to show that at room temperature the ice melts, but the chocolate does not.
        - Some students may have broken the chocolate into smaller pieces to get a shape change. This is acceptable for this age group.
- Collect student ideas and infuse appropriate academic vocabulary during the discussion.
- Class reads *Melting Matter* by Amy S. Hansen on epic! Books.

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Resources:

- *Melting Matter* by Amy S. Hansen on epic! Books

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: melt, temperature, heat, cooling, pressure, body temperature, freeze, liquid, solid, state, state of matter

ELABORATE (Applications / Extensions)

Activity Description:

- Students relate the learning from the Explore and Explain phases to explain the melting ice pop through the development of an *Explanatory Model.*
- After students complete their models allow them to share their ideas with the class.
- Prompt further discussion on how these concepts may apply to the development of the 4th Little Pig's shelter.

Resources:

- Explanatory Model

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

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Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Planning and Carrying Out Investigations*
- ❏ **DCI:** *PS1.A: Structure and Properties of Matter*
- ❏ **CCC:** *Cause and Effect; Energy and Matter*

Summative Assessment Description(s)

- *Explanatory Model* from Elaborate
- Add any new information to the *Summary Table.*

Resources:

- Explanatory Model
- Summary Table

Elaborate Further / Reflect / Enrichment: Optional

Activity Description:

- Students watch *Inside the Ice Hotel in Quebec City! Video, Inside Sweden's Ice Hotel Video* & read the *You can now spend the night in a hotel made entirely out of CHOCOLATE! Article.*
- Teacher asks students: How does what we have been discussing apply to these videos, the article and the 4th Little Pig's houses we are designing?

Resources:

- Inside the Ice Hotel in Quebec City! Video
- Inside Sweden's Ice Hotel Video
- You can now spend the night in a hotel made entirely out of CHOCOLATE! Article

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Learning Sequence 4

Brief Description:
Students look at bridge photographs to expose them to successful bridge designs. Their observations will help them to construct a physical model of a bridge. Students investigate and test materials in order to help them design a bridge to hold as much weight as possible.

Suggested Pacing:
2 - 2.5 hrs

Lesson-Level Phenomenon/Design Problem:
Bridge Structure and Function

Relationship to Anchoring Phenomena/Design Problem:
Students understand that different materials are better for different purposes. The materials the students select in the final 4th Little Pig house design have to meet the intended goals of withstanding a hot summer day and a big storm (wind and rain)

Learning Sequence Driving Question:
Why are different materials better suited for certain purposes than others?

Student Expected Outcomes:

- Students will investigate a variety of materials and test their durability.
- Students will construct a physical model of a bridge out of chosen materials in order to hold as much weight as possible and meet an intended purpose.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Analyzing and Interpreting Data • Analyze data from tests of an object or tool to determine if it works as intended. **Constructing Explanations and Designing Solutions** • Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. **Asking Questions and Defining Problems** • Ask questions based on observations to find more information about the	**PS1.A: Structure and Properties of Matter** • Different properties are suited to different purposes. **ETS1.A: Defining and Delimiting Engineering Problems** • A situation that people want to change or create can be approached as a problem to be solved through engineering. • Asking questions, making observations, and gathering information are helpful in thinking about problems. • Before beginning to design a solution, it is important to	**Cause and Effect** • Simple tests can be designed to gather evidence to support or refute student ideas about causes. **Patterns** • Patterns in the natural and human designed world can be observed.

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natural and/or designed world(s). ● Define a simple problem that can be solved through the development of a new or improved object or tool.	clearly understand the problem.	

Related Performance Expectation(s) in this Bundle:

- 2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for the intended purpose.*
  - [Clarification Statement: Examples of properties could include strength, flexibility, hardness, texture, and absorbency.]
  - [Assessment Boundary: Assessment of quantitative measurements is limited to length.]

- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Possible Common Core State Standards Connections:

ELA/Literacy —

- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1)(2-PS1-2) (2-PS1-3)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1) (2-PS1-2)(2-PS1-3)(K-2-ETS1-1)
- RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-PS1-2)(K-2-ETS1-1)
- MP.4 Model with mathematics. (2-PS1-1)(2-PS1-2) (K-2-ETS1-1)
- MP.5 Use appropriate tools strategically. (2-PS1-2)(K-2-ETS1-1)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-PS1-1)(2-PS1-2)(K-2-ETS1-1)

Prior Student Knowledge:

N/A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Students view the slide #1 *Bridge Slideshow*. Allow students to make observations about the materials and predict the function of each bridge based on the structure and material.
- Ask students:
  - What are the similarities between all of these bridges?
  - What are the differences between the bridges?
  - How do you think each bridge is used?
- Students review the scenario on Slide #2 of the *Bridge Slideshow*.
  - The Little Pigs are hungry and need to get their car over the river to the grocery store, but the

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river has washed the old bridge away. They need to build a new bridge that is strong enough for big cars and lots of pigs to travel over it. The river floods every spring and dries up late in the summer, so the bridge has to withstand flooding and high summer temperatures.
    - Help students to come to the idea that the properties of the material have to be waterproof and sturdy.

Resources:
- Bridge Slideshow

Teacher Action(s):
- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):
- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)
Activity Description:
- Students work in small groups to explore the absorbency and durability of materials using the *Explore Handout*.
    - Students will need access to (2) 1" x 8 " strips of cloth/felt, aluminum foil, wax paper, construction paper, cardboard, and toilet paper, as well as a spray bottle or dropper, masking tape, pennies or blocks (weights).
    - Students can tape the strips across two desks.
    - Students should devise a way of testing the strength of the material as well as the absorbency.
        - *Teacher Note: Demonstrate with a strip of tissue paper how to test with water. Noting the number of sprays or drops.*
    - Students should make observations of each material. Observations can include how many pennies/blocks the wet strip holds before it breaks compared to how many pennies/blocks the dry strip holds before it breaks.
    - Allow students to analyze their observations to make a determination about what material would be best to construct a bridge (testing over a sink, bucket or bin).

Resources:
- Explore Handout

Teacher Action(s):
- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):
- Thinks freely, within the limits of the activity

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- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)
Activity Description:

- Allow students to share their findings from the absorbency and durability tests. Help students to include appropriate science vocabulary as they construct their explanations and share with the class.
- Students may have used different strategies for measuring durability and absorbency. Help students to understand that we can not compare our results if we used different modes of data collection.
    - If one group used pennies to assess weight and another group used wooden blocks, the data cannot be compared. We can just make statements like "fabric held the most weight and toilet paper held the least weight".
    - The same issue may occur with water, some groups may have used 1 drop of water and other groups 10 drops of water before adding weights.
    - Helps students to understand that we can not compare our results when the variables/controls are not the same.
- At the conclusion of the discussion, read the text *Amazing Structures: Bridges* by Rebecca Pettiford on epic Books or *Bridges: Amazing Structures to Design, Build and Test* by Carol Johnson.

Resources:

- *Amazing Structures: Bridges* by Rebecca Pettiford on epic! Books
- *Bridges: Amazing Structures to Design, Build and Test* by Carol Johnson

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: flexible, flexibility, strength, hardness, weight, absorbency, human-made, physical model, material, durability

ELABORATE (Applications / Extensions)
Activity Description:

- Provide students with the *Map*.
    - You may want to laminate the sheets, so they can be used again.

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- Students have to develop a bridge, place over the river image on the map, to allow the students to get from their house to the grocery store.
    - Provide students with a variety of design materials.
    - Allow the students to construct the bridges and describe how each design element plays a role in the functionality of the bridge.
    - The ultimate goals of the bridge is to be durable enough to hold a toy car (represents the family vehicle going over the bridge to the store).
    - Materials for bridge construction can include:
        - Pipe cleaners
        - piece of clay
        - blocks/cubes
        - Straws/bendy straws
        - Popsicle sticks/toothpicks
        - cloth/felt
        - aluminum foil
        - wax paper
        - construction paper
        - cardboard
        - toilet paper
- Upon completion of the bridges it is essential to provide a forum for students to share their designs and rationale for materials and structure. This can be done verbally through presentation or gallery walk where students critique designs using academic vocabulary.

Resources:

- Map (print on 11 x 17 paper).

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Analyzing and Interpreting Data; Constructing Explanations and Designing Solutions; Asking Questions and Defining Problems*
- ❏ **DCI:** *PS1.A: Structure and Properties of Matter; ETS1.A: Defining and Delimiting Engineering Problems*

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❏ CCC: *Cause and Effect; Patterns*

Summative Assessment Description(s)

- Bridge construction with material/structure rationale
- Add new information to the *Summary Table*.

Resources:

- Summary Table

Elaborate Further / Reflect / Enrichment: Optional

- Students can be encouraged to look at the history of bridges over time and how the materials being used have evolved and why those changes have taken place. Why were some successful, while others failed?
- Read *Iggy Peck, Architect* by Andrea Beaty on Epic Books about creative bridge building.

Resources:

- *Iggy Peck, Architect* by Andrea Beaty on Epic Books

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Learning Sequence 5

Brief Description:
Students will use a variety of materials to build, deconstruct, and reassemble a device.. Students will be able to build and redesign multiple devices throughout the lesson using the same objects.

Suggested Pacing:
1.5 - 2 hrs for 5Es
0.75 - 1.25 hrs for Culminating Performance Task

Lesson-Level Phenomenon/Design Problem:
Text-*Rosie Revere Engineer*

Relationship to Anchoring Phenomena/Design Problem:
Students will understand that materials can be repurposed and used to construct a new and complete object. Students will have to consider how they will repurpose and combine items to build the 4th little pigs home to meet specific requirements.

Learning Sequence Driving Question:
How can objects be made and remade into new objects using existing pieces?

Student Expected Outcomes:

- Students will describe how different structures can be assembled and reassembled into new structures using the same objects.
- Students will describe how the structures are similar and different from the original structure.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Constructing Explanations and Designing Solutions • Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. **Asking Questions and Defining Problems** • Ask questions based on observations to find more information about the natural and/or designed world(s). • Define a simple problem that can be solved through the development of a new or improved	**PS1.A: Structure and Properties of Matter** • Different properties are suited to different purposes. • A great variety of objects can be built up from a small set of pieces. **ETS1.A: Defining and Delimiting Engineering Problems** • A situation that people want to change or create can be approached as a problem to be solved through engineering. • Asking questions, making observations, and gathering information are helpful in thinking about	**Energy and Matter** • Objects may break into smaller pieces and be put together into larger pieces, or change shapes

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object or tool.	problems. • Before beginning to design a solution, it is important to clearly understand the problem.	

Related Performance Expectation(s) in this Bundle:

- 2-PS1-3: Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.
  - [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.]
- K-2-ETS1-1: Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Possible Common Core State Standards Connections:

ELA/Literacy —

- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-PS1-1)(2-PS1-2) (2-PS1-3)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-PS1-1) (2-PS1-2)(2-PS1-3)(K-2-ETS1-1)

Possible Preconceptions/Misconceptions:

Students may believe that:

- objects to build a structure can only be designed in a certain way
- the order of similar objects does not create a different structure

Prior Student Knowledge:

N/A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Read the *Rosie Revere Engineer* by Andrea Beaty.
- Students discuss how Rosie made her inventions.
  - Ask students:
    - Have you ever been an engineer?
    - What did you make?
    - What supplies did you use?

Resources:

- *Rosie Revere Engineer* by Andrea Beaty on epic Books (may also be available on Youtube)

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

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Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

- Provide students with a bag of parts.
    - Possible Materials: toilet paper tube, rubber band, straw, plastic wrap, legos, blocks, erasers, string, paper plate, pipe cleaner, etc.) *Do not provide glue or tape, because students will have to dissemble their projects to design something to meet a new need using the same materials.
- Students work in small groups to build a device that could catch a fly.
- Allow students to share their designs with the class and introduce the word *prototype*.
- Explain to the students that sometimes our initial ideas do not work the way they are intended and we have to modify our designs.
- Throw the kids a curve ball and tell them that the problem has changed, we no longer have to catch a fly, but we have to make something that can fly and we have no new parts.
- We have to break apart our fly catcher designs and reuse the parts to make our flying object.
- After students complete their second build, allow them to share their designs with the class and discuss how they repurposed their materials.

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Through discussion about the explorations, help students to understand that pieces can be put together in different ways to build different things.
- Engineers try to solve problems that people or animals may be faced with and they often have to put things together in unique ways to solve the design problem.
- Engineers rarely solve the design problem in their first attempt. Thomas Edison had 1000's of attempts at the light bulb before it worked, but with each iteration, he found out more about what doesn't work.
    - F.A.I.L. = **F**irst **A**ttempt **I**n **L**earning
- Prompts for student discussion:
    - How were your designed structures similar? Different?
    - Did all of the groups come up with the same designs to solve the two design challenges?

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- How were the materials used differently in the designs we saw today?
- Can we change the use of a material with a different design challenge?
- Were there any solutions that included only one part/material?
- Is there more than one way to solve a problem?

- Read book(s) on epic Books about Engineers.

Resources:

- Engineering books on epic Books
  - *Engineers Build Models*
  - *Engineers Solve Problems*
  - *How Engineers Find Solutions*
  - *Engineering in our Everyday Lives*

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Apply new labels, definitions, explanations, and skills in new but similar situations
- Use previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

Vocabulary: human-made, physical model, recycle, design, machine, engineer, engineering, design problem, material, prototype

ELABORATE (Applications / Extensions)

Activity Description:

- Students view the *Time Lapse Video of a "Canstruction."*
- Students make note of the materials they saw being used in the completion of the character.
- They should share their lists with their peers in small groups and discuss how the materials were used to produce the final character.
- Prompt the class with this question:
  - How can we change the purpose of an everyday object to meet a new need?
  - What objects could the 4th Little Pig use to protect herself from the Big Bad Wolf, the hot summer days and the bad thunderstorm that is coming?
  - How can different items in the classroom work together to make a strong and weatherproof house for the 4th Little Pig?

Resources:

- Time Lapse Video of a "Canstruction"

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations

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- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Constructing Explanations and Designing Solutions; Asking Questions and Defining Problems*
- ❏ **DCI:** *PS1.A: Structure and Properties of Matter; ETS1.A: Defining and Delimiting Engineering Problems*
- ❏ **CCC:** *Energy and Matter*

Summative Assessment Description(s)

- Student discussion and use of academic vocabulary to respond to the prompts in the elaborate phase of the learning sequence.
- Add to Summary Table

Resources:

- Summary Table

Elaborate Further / Reflect / Enrichment: Optional

- You could run a food drive and create your own food sculpture.

Culminating Performance Task:

Activity Description:

This is a summative assessment of the students' understanding of matter and its interactions relative to the construction and design elements of the 4th Little Pig's home.

- Review the design problem: The Big Bad Wolf is back to his old ways. A new little pig has moved into town. She needs a shelter because a big summer storm is coming. She has heard about the story of the Three Little Pigs and is worried. There are no more bricks available in town. Using the materials available in town (our classroom), how would you build a house to keep the new pig safe from the wolf and the weather (hot summer temperatures, wind, water)?
- Hand out the students' original initial paper and pencil designs (Pre-assessment Worksheet - Version 1 or Version 2 from Learning Sequence #1) for review.
    - Help students to recall the content they learned in each of the learning sequences - refer to the Summary Table.
    - Ask students if scientific understanding is apparent in their designs.
    - Prompt students to make the necessary changes to better align their designs to their new scientific understanding.
- After the students have completed their final paper and pencil designs, students should gallery walk and provide feedback to one another.
    - This feedback should be related to the newly learned science principles.

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- You may want to establish groups to review each of the designs under a specific lens (1) material science-durability (2) material science-absorbency, (3) properties of matter, (4) design.
- After reviewing the feedback from their peers students/groups should finalize their designs and begin construction.
  - Have all of the materials out during the final design reviews to remind students what they are allowed to use in their final project.
  - Upon showcasing their final projects, students should explain the structures and functions of the design elements.
  - Students can use the Student Self-Assessment Rubric on page 3 of the Pre-assessment Worksheet - Version 1 to help guide them.
  - Teacher may select to test their designs against the rain (spray bottle), the big bad wolf (fan), or the hot summer temperatures (hair dryer).

Resources:

- Pre-assessment Worksheet -Version 1

or

- Pre-assessment Worksheet -Version 2

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Unit 2 - Koa Tree

Plants and animals are dependent on each other and the environment in order to survive. The koa tree provides a scenario for students to figure out the interdependent relationship between plants, animals and the environment while solving the mystery of the koa tree's presence on Reunion Island. The koa tree is a known species of Hawaii, the species also exists on Reunion Island, off the western coast of Africa. The mystery the students must solve throughout the unit is, how did the tree travel 10,000 miles to appear on both islands?

The unit provides students with experiences that scaffolded their understanding of plants needs (light, water, climate). The koa tree on Reunion Island needed a tropical climate with the appropriate amount of light, water, and temperature to germinate and grow. Although we are not sure where the koa tree originated, we do know that pollination needed to occur in order for new koa trees to grow. We also know that a koa seed needed to be dispersed from one island to another. Like scientists before them, students hypothesize how the seed traveled from island to island. Was it by water? Was it attached to a bird? Was it transported in a bird's body and deposited as scat? This learning sequence provides students with a real life science mystery that gives purpose to their study on plants, animals, and habitats.

To access the flowchart for this unit, click here.

Teacher Note: Consider making this the final bundle of the year.

Suggested Pacing:
14 - 15 hrs

Anchoring Phenomenon/Design Problem:
The Mystery of the koa Tree

Unit Driving Question:
How does the koa tree grow in two places 10,000 miles apart?

Culminating Performance Task:
Students will create a final explanatory model, with zoom out boxes, that describes why the koa can exist in both Hawaii and Reunion Island, a prediction of how the seed was able to travel to Reunion Island using evidence learned from seed dispersal and pollination sequences. Students should also explain why the koa does not grow in other regions such as Connecticut.

NGSS Performance Expectation(s): (Hyperlinks will bring reader to NGSS Evidence Statements)

- 2-PS1-4: Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
  - [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.]
- 2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.
  - [Assessment Boundary: Assessment is limited to testing one variable at a time.]
- 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.
  - [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.]
  - [Assessment Boundary: Assessment does not include specific animal and plant names in

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specific habitats.]

- 2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid.
- K-2ETS-1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Three Dimensions that form the Foundation for these NGSS Performance Expectations:

Science & Engineering Practices:

Engaging in Argument from Evidence

- Construct an argument with evidence to support a claim.

Planning and Carrying Out Investigations

- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.
- Make observations (firsthand or from media) to collect data which can be used to make comparisons.

Developing and Using Models

- Develop a simple model based on evidence to represent a proposed object or tool.

Obtaining, Evaluating, and Communicating Information

- Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question.

Disciplinary Core Ideas:

PS1.B: Chemical Reactions

- Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.

LS2.A: Interdependent Relationships in Ecosystems

- Plants depend on water and light to grow.
- Plants depend on animals for pollination or to move their seeds around.

LS4.D: Biodiversity and Humans

- There are many different kinds of living things in any area, and they exist in different places on land and in water.

ESS2.C: The Roles of Water in Earth's Surface Processes

- Water is found in the ocean, rivers, lakes, and ponds.
- Water exists as solid ice and in liquid form.

ETS1.B: Developing Possible Solutions

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. *(secondary)*

Crosscutting Concepts:

Cause and Effect

- Events have causes that generate observable patterns.

Structure and Function

- The shape and stability of structures of natural and designed objects are related to their function(s).

Patterns

- Patterns in the natural world can be observed.

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Possible Common Core State Standards Connections:

ELA/Literacy —

- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)(2-LS2-2)
- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-PS1-4)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)
- RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-4)
- W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS2-3)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1)(2-ESS2-3)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-LS2-1)
- MP.4 Model with mathematics .(2-LS2-1)(2-LS2-2)
- MP.5 Use appropriate tools strategically. (2-LS2-1)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-LS2-2)

PROGRESSION OF LEARNING

Learning Sequence 1

- **Learning Sequence Driving Question**
  - How does the koa tree grow in two places 10,000 miles apart?
- Learning Sequence 1
- **Relationship to Anchoring Phenomena/Design Problem**
  - This is the introduction to the anchoring phenomenon-The koa Tree Mystery.
- **Student Expected Outcome:**
  - Students will generate initial models of koa tree travel and questions necessary for deeper investigation of the koa tree mystery.

Learning Sequence 2

- **Learning Sequence Driving Question**
  - Do all plants need the same amount of water and sunlight?
- Learning Sequence 2
- **Relationship to Anchoring Phenomena/Design Problem**
  - Students investigate the amount of sunlight and water that plants need to survive in their natural habitats.
- **Student Expected Outcomes:**

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- Students will plan (with guidance) and carry out investigations (as a group) to describe the cause and effect of how much light and water are needed for plants to grow.
- Students will develop a model to explain which seeds will be successful on the different regions of the school grounds using evidence from their guided investigations and seed packet information.

Learning Sequence 3

- **Learning Sequence Driving Question**
  - Can the koa tree survive and grow in Connecticut?
- Learning Sequence 3
- **Relationship to Anchoring Phenomena/Design Problem**
  - Students come to understand that the habitat in which the koa resides has specific characteristics: appropriate rainfall, temperature and soil types.
- **Student Expected Outcomes:**
  - Students will obtain, organize and evaluate information regarding the habitats associated with Connecticut, Hawaii and Reunion Island.
  - Students will identify similarities and differences (patterns) in the habitats of Reunion Island and Hawaii and construct an argument using scientific reasoning and evidence about whether or not the koa tree can survive and grow in Connecticut.

Learning Sequence 4 *There are 2 Learning Sequences for this sequence!*

- **Learning Sequence Driving Question**
  - How do plants depend on animals?
- Learning Sequence 4A (Pollination)
- Learning Sequence 4B (Seed Dispersal)
- **Relationship to Anchoring Phenomena/Design Problem**
  - Animals and other forces help plants pollinate and/or move their seeds from place to place.
- **Student Expected Outcomes:**
  - Students will investigate how animals help plants in pollination and seed dispersal.
  - Students will create a model to demonstrate how pollination happens. (4A)
  - Students will design a simple sketch or physical model to show how the shape and properties of a seed help it move to a location where it can grow. (4B)

Learning Sequence 5

- **Learning Sequence Driving Question**
  - How does water and temperature determine if a koa seed survives?
- Learning Sequence 5
- **Relationship to Anchoring Phenomena/Design Problem**
  - Reunion Island and Hawaii are both tropical locations. The koa tree needs a tropical habitat in order to grow. Areas that are too cold and freeze water will limit what plants can grow there.
- **Student Expected Outcome:**
  - Students will construct an explanation using evidence about how heating and cooling a substance may cause changes that can be observed, sometimes the changes can be reversible, sometimes not.

Assessments:

- Culminating Performance Task

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- Students will create a final explanatory model, with zoom out boxes, that describes why the koa can exist in both Hawaii and Reunion, a prediction of how the seed was able to travel to Reunion Island using evidence learned from seed dispersal and pollinations sequences. Students should also explain why the koa does not grow in other regions such as Connecticut.
  - Final Explanatory Model

- Grade 2 Performance Expectation Rubrics and Prompts
- Elementary Assessment Resource

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials
- EPIC! Digital Library - G2 U2 List
  - Includes ebooks and videos
  - Must have an educator user account for free access

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Learning Sequence 1

Brief Description:
This learning sequence introduces the mystery of the koa tree and how it is found in two locations on Earth over 10,000 miles apart.

Suggested Pacing:
1.75 - 1.25 hrs

Lesson-Level Phenomenon/Design Problem:
The mystery of the koa tree and world map

Relationship to Anchoring Phenomena/Design Problem:
This is the introduction to the anchoring phenomenon-The Koa Tree Mystery.

Learning Sequence Driving Question:
How does the koa tree grow in two places 10,000 miles apart?

Student Expected Outcome:
- Students will generate initial models of koa tree travel and questions necessary for deeper investigation of the koa tree mystery.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Developing and Using Models ● Develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s).*	**LS4.D: Biodiversity and Humans** ● There are many different kinds of living things in any area, and they exist in different places on land and in water.	**Cause and Effect** ● Simple investigations can be designed to gather evidence to support or refute student ideas about causes. *

* These elements are not specific to the unit. Unit of performance expectations.

Related Performance Expectation(s) in this Unit:
- 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.
  - [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.]
  - [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

Possible Common Core State Standards Connections:

ELA/Literacy —

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- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)(2-LS2-2)

Mathematics —

- MP.4 Model with mathematics. (2-LS2-1)(2-LS2-2)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-LS2-2)

Prior Student Knowledge:
K.ETS1.A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)
Activity Description:

- Share the *koa Tree Slideshow*.
- Students complete the *Discussion Diamond Template.*
  - Allow the students to work in small cooperative groups (no more than 4) to discuss their initial ideas of how the tree is able to exist on Hawaii and Reunion Island.
  - Provide printed images of the trees from both islands and maps for each of the student groups.
  - Students brainstorm ideas for the mystery in their corner of the 11" x 17" discussion diamond sheet. After spending 2-5 minutes in silence recording their ideas, students should share their ideas with the rest of the group.
  - The purpose of this sharing/discussion is to come to a consensus about their initial ideas of how the tree was able to get from one island to the other.
- Once a consensus has been reached, each group draws an initial model of their consensus ideas in the center of their discussion diamond. The model should include both images and explanations for their ideas.

Resources:

- Koa Tree Slideshow
- Discussion Diamond Template

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)
Activity Description:

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- Upon completion of the initial models, have each of the cooperative groups share their ideas for how the tree was able to grow in these two locations so far apart.
- After each of the groups has shared their initial models allow students to generate questions they would like to investigate to solve the mystery.
- The *Question Formulation Technique* can be utilized to help students generate the bulk of questions and then hone those questions to be scientific and investigatory.
- Record the scientific questions students generate.
    - These questions could be categorized into themes such as:
        - What do plants need to survive?
        - How do plants depend on animals?
        - How do seeds travel?
        - How does water impact where a plant lives (habitat)?
        - How does temperature impact where a plant lives (habitat)?
            - It is best if students identify the themes and you tweak them. This process builds student ownership and motivation for learning, as the questions generated will drive student learning throughout the unit.

Resources:

- Question Formulation Technique

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

Additional Resources:

- G2 Unit Materials List
    - Click on specific tab for unit-specific materials

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Learning Sequence 2

Brief Description:
Students will plan and conduct an investigation to identify if varying amounts of water and/or sunlight impact plants. Students will conduct scientifically sound investigations by using consistent measuring and observational tools.

Suggested Pacing:
3.25 - 3.75 hrs

Lesson-Level Phenomenon/Design Problem:
Dead Plant and Live Plant

Relationship to Anchoring Phenomena/Design Problem:
Students investigate the amount of sunlight and water that plants need to survive in their natural habitats.

Learning Sequence Driving Question:
Do all plants need the same amount of water and sunlight?

Student Expected Outcomes:

- Students will plan (with guidance) and carry out investigations (as a group) to describe the cause and effect of how much light and water are needed for plants to grow.
- Students will develop a model to explain which seeds will be successful on the different regions of the school grounds using evidence from their guided investigations and seed packet information.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Planning and Carrying Out Investigations • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. • Make observations (firsthand or from media) to collect data which can be used to make comparisons.	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on water and light to grow. **LS4.D: Biodiversity and Humans** • There are many different kinds of living things in any area, and they exist in different places on land and in water.	**Cause and Effect** • Events have causes that generate observable patterns

Related Performance Expectation(s) in this Unit:

- 2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.
  - [Assessment Boundary: Assessment is limited to testing one variable at a time.]
- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.
  - [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of

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different habitats.]
- [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]

Possible Common Core State Standards Connections:

ELA/Literacy —
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1)(2-ESS2-3)

Mathematics —
- MP.2 Reason abstractly and quantitatively. (2-LS2-1)
- MP.4 Model with mathematics. (2-LS2-1)(2-LS2-2)
- MP.5 Use appropriate tools strategically. (2-LS2-1)

Prior Student Knowledge:
K-LS1. C, 1-LS1-1, 1-LS1.A

Possible Preconceptions/Misconceptions:
- All plants need the same amount of water.
- You can't overwater a plant.
- All plants need the same amount of light.

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)
Activity Description:
- Show students *Tomato Plant Pictures*. Ask the students to discuss what they think is happening with the plants and why they look the way they do (#1 Alive, #2 Dying, #3 Dead). Guide the discussion and encourage student questioning to determine what plants need to survive or grow in a healthy way. From their investigations in kindergarten, students should know that plants need sunlight and water to live and grow, but they will not know how much light and water are necessary for plant survival. Help students identify that scale, proportion and quantity of sunlight and water can be investigated.
- Students complete the *Pre-assessment.*

Resources:
- Tomato Plant Pictures
- Pre-assessment

Teacher Action(s):
- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):
- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"

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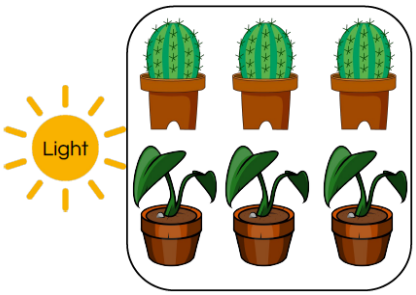
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

- Students collaboratively plan and conduct two investigations on the amount of sunlight and water 2 varieties of plants need using a *Data Table* (sample provided).
- Show students the plants: 2 varieties (succulent/bean) - 6 of each variety is suggested for data collection
- Assign groups of students to collect observations for either inquiry (1) sunlight, succulent; (2) sunlight, bean; (3) water, succulent or (4) water, bean.
    - Ultimately different groups will be responsible for data collection on ONE of the four data tables. Each group will share their observations with the entire class.
    - *While there is a sample Data Table provided, PLEASE allow students to have input in what content should be present in the table and make the necessary modifications. Students need to plan this investigation.*
- All plants (within the same variety) should be of the same relative size and age. Help students to plan an investigation to determine the effects of different amounts of water or sunlight on plants.
    - Measurements should be consistent across groups (1) and (2) and groups (3) and (4).
    - Scaffold the discussion to include variables and controls.- class will need to focus on one investigation (sunlight or water) at a time
- Teacher Note:
    - Possible student investigation design for amount of sunlight: full sun (on windowsill), partial sun (mid classroom location) and no sun (in cabinet)
    - Possible student investigation designs for amount of water: students determine what their initial amount of water is going to be, then they will provide all of that amount to one plant, half to the second and none to the third



- Prompts to get students thinking:
    - How can we measure the amount of light? (ex: hours, minutes, distance from light source...)
    - How much sunlight should we give each plant?
    - What observations will we make? (make sure all observations are consistent color, height, # leaves…)
    - How will we know what sunlight amount is best for the plant?
    - Do both plants need the same amount of sunlight?
- As students respond to the prompts help students to develop a data table to track their observations over a minimum of two weeks.

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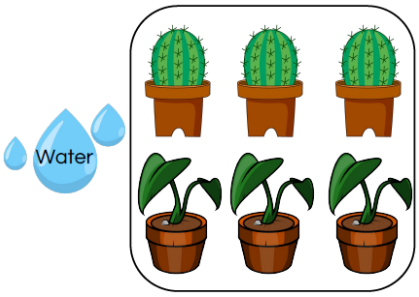

- Prompts to get students thinking:
  - How can we measure water? (ex: spoonful, droppers, cups…)
  - How much water should we give each plant? (help students to make incremental measurements 2 droppers full, 4, droppers full, 6, droppers full...)
  - How often should we water the plant? (make sure all plants have the same watering schedule-daily, hourly, weekly…)
  - What observations will we make? (make sure all observations are consistent color, height, # leaves…)
  - How will we know what water amount is best for the plant?
  - Do both plants need the same amount of water
- As students respond to the prompts help students to develop a data table to track their observations over a minimum of two weeks.
- Teacher Note: If plants do not die as a result of investigation design, there should still be an observable change (yellow leaves, rotting stem, plant growing toward light source) that supports the Crosscutting Concept of *Cause and Effect.*

Resources:

- Data Tables (sample)

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- At the completion of the investigation, help students to share their data and observations with the class. Generate a class data set.
- Students discuss what they notice about the data (identify patterns).

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- Students discuss the data in small groups before sharing their ideas with the whole class. Students will need to look at patterns in their observations in order to make a claim. The following prompts can be used to get students to review the data for specific patterns.
    - How was the (succulent/bean) affected by the different amounts of water?
    - How was the (succulent/bean) affected by the different amounts of sunlight?
    - Which (succulent/bean) appeared to be the healthiest? What is the evidence?
    - Did the succulent and bean need the same amount of (water/sunlight)?
- Once the students have made some claims based on their evidence, help students to understand that different types of plants have different needs (in terms of water and sunlight quantity).
    - These needs are met in different habitats. Discuss with students that not all plants and animals can live in the same habitats. (2-LS4-1 - Make observations of plants and animals to compare the diversity of life in different habitats.)
- As a class read the Desert books and one other book pair shown in Resources and discuss how this information applies.
    - Identify that cactus plants are succulents and their needs are different from those of a bean plant.
    - Students describe the habitat and the organisms that live there and compare habitats.

Resources:

- Desert
    - From Seed to Cactus by Lisa Owings on epic! Books
    - Life in a Desert by Kari Schuetz on epic! Books
- Wetland
    - From Seed to Cattail by Lisa Owings on epic! Books
    - Life in a Wetland by Laura Hamilton Waxman on epic! Books
- Forest
    - From Cone to Pine Tree by Emma Carlson Berne on epic! Books
    - Life in a Forest by Laura Hamilton Waxman on epic! Books

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: grow, survive, plant, light, drought, growth, survive, temperature, seasonal, water, habitat

ELABORATE (Applications / Extensions)

Activity Description:

- Read *Jack's Garden* - by Henry Cole.
- Provide students with a variety of seed packets; have students observe the packets and make note of the needs for the different plant varieties.

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- Please select seed packets that have both pictorial and textual representation of the plants needs, such as Burpee seed packets like the example of a *Seed Packet (Slide 5 from Data Tables (sample)*
- Encourage the students to apply or extend the concepts learned from Explore (amount of water and sunlight needed for different plants) and the information presented on the seed packets to the school garden scenario.

- Students will use the seed packet information to create a grow zone map of the school yard identifying which plants will need to grow in shade, partial sun, and full sun and watering instructions for their plants.
  - Draw reasonable conclusions from evidence provided by the seed packets (Slide 5)
  - Teacher Note: create a map of your school grounds or use the *Schoolyard Map Sample* (print on 11x17 paper) and have students analyze the map and place plants in appropriate locations with explanation.
- *Save grow zone maps for LS3 Elaborate*

Resources:

- *Jack's Garden* by Henry Cole (might be available as a youtube read)
- Seed Packet (Slide 5 from Data Tables (sample)
- Schoolyard Map Sample (print on 11x17 paper)

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

Elaborate Further / Reflect / Enrichment: Optional

Activity Description:

- Students create a seed packet design (no seeds needed) with a picture of the koa tree on the front and the growing facts on the back using the information provided in *Resources* and the *Seed Packet Design* slide.

Resources:

- Native Plants Hawaii
- Teacher Resource:
  - USDA: Koa Plant Fact Sheet. Use the *Establishment* and *Management* sections from this source
- Seed Packet Design

EVALUATE

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Formative Monitoring Description(s) (Questioning / Discussion)
Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Planning and Carrying Out Investigations*
- ❏ **DCI:** *LS2.A: Interdependent Relationships in Ecosystems; LS4.D: Biodiversity and Humans*
- ❏ **CCC:** *Cause and Effect*

Summative Assessment Description(s)

- Assess student understanding of differing plant needs (scale, proportion and quantity) of water and sunlight through the elaborate activity. Assess student placement and explanations of plant placement on the school grounds.
- Help students to track their learning over the course of the unit with the *Summary Table*. The *Summary Table* should be completed at the end of each learning sequence.

Resources:

- Summary Table

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Learning Sequence 3

Brief Description:
Students explore how the location of different species is dependent on the characteristics of the habitat (average annual temperature, rainfall, etc). In this lesson students obtain and evaluate information about the habitats of Reunion Island and Hawaii. Students then communicate (using scientific reasoning and evidence) as to whether or not the koa tree could survive and grow in Connecticut.

Suggested Pacing:
2 - 2.5 hrs

Lesson-Level Phenomenon/Design Problem:
Can the koa tree survive and grow in Connecticut?

Relationship to Anchoring Phenomena/Design Problem:
Characteristics of a koa tree's habitat

Learning Sequence Driving Question:
Can the koa tree survive and grow in Connecticut?

Student Expected Outcomes:

- Students will obtain, organize and evaluate information regarding the habitats associated with Connecticut, Hawaii and Reunion Island.
- Students will identify similarities and differences (patterns) in the habitats of Reunion Island and Hawaii and construct an argument using scientific reasoning and evidence about whether or not the koa tree can survive and grow in Connecticut.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Obtaining, Evaluating, and Communicating Information • Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. **Engaging in Argument from Evidence** • Construct an argument with evidence to support a claim.	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on water and light to grow. **LS4.D: Biodiversity and Humans** • There are many different kinds of living things in any area, and they exist in different places on land and in water. **ESS2.C: The Roles of Water in Earth's Surface Processes** • Water is found in the ocean, rivers, lakes, and ponds.	**Patterns** • Patterns in the natural world can be observed.

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Planning and Carrying Out Investigations ● Make observations (firsthand or from media) to collect data which can be used to make comparisons.	● Water exists as solid ice and in liquid form.	

Related Performance Expectation(s) in this Unit:

- 2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid.
- 2-LS2-1: Plan and conduct an investigation to determine if plants need sunlight and water to grow.
  - [Assessment Boundary: Assessment is limited to testing one variable at a time.]

Possible Common Core State Standards Connections:

ELA/Literacy —

- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)(2-LS2-2).
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)
- W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS2-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS2-1)(2-ESS2-3)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-LS2-1)
- MP.4 Model with mathematics. (2-LS2-1)(2-LS2-2)
- MP.5 Use appropriate tools strategically. (2-LS2-1)

Prior Student Knowledge: ***(click link to see specific performance expectations from previous grades)***
K.LS1.C ; K.ESS3.A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)
Activity Description:

- Show slides #1-2 of the *Slideshow.*
- Allow students to review the *koa fact sheet* and generate a list of observations and questions related to the prompt:
  - Can the koa survive and grow in Connecticut?
- Students can complete an *I notice, I wonder* chart while reviewing the koa data sheet.
  - These observations and questions can be used in class discussion to leverage student ownership. Help students to share their observations and questions;
  - generate a class list of items they would need to know more about in order to determine if the koa could survive and grow in Connecticut.

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- Scaffold discussion so students mention, at minimum temperature, rainfall (water), relate this back to what they learned in the previous learning sequence.

Resources:

- Slideshow
- koa Fact Sheet
- I notice, I wonder chart

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

- Set up three location stations around the classroom. Each station (Connecticut, Hawaii, and Reunion Island) should include the two coordinating, printed slides #4-9 of the *Slideshow* and any additional resources.
  - Students work in small cooperative groups to identify the similarities and differences of climate and water sources throughout Connecticut, Hawaii and Reunion Island.
  - Students record their research on the *Exploration Sheet.*
- Teacher Note: It might be helpful to have the Library Media Specialist pull resources about these three locations specific to the types of plants and animals that live in the ecosystem, geography, geology and climate.

Resources:

- Slideshow (print slides 4-9 for location stations)
- Exploration Sheet

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

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EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Teacher posts the *Agree-Disagree Line Claims* on opposite sides of the classroom.
- Prompt students to stand next to the claim that best matches their own claim from Explore.
    - Students should share their claims and provide feedback to the other students who selected the same claim.
    - Students in these groups should generate a list of evidence to rationalize their claim.
    - The two groups should share their ideas and evidence with the whole class.
- Students share the similarities and differences between the three locations.
    - Teacher Notes:
        - Use student generated evidence as a prompt for the discussion.
        - The goal of the discussion is to help students realize that living things have specific conditions that make them successful in a region. Success is measured by a plant or animal's ability to survive, grow and reproduce. Students collected their own evidence on what makes the koa successful.
- Students view the *USDA grow zone map and legend.* The koa tree can only survive and grow in **zones 9-11**. Ask students to share how their claims match up to the map presented, and if this new data would cause them to modify their claim. Please point out Hawaii and Connecticut, help students to understand that the location of Hawaii on the map is not accurate. You may need to refer to the previous map of Hawaii, Reunion and Connecticut to help students get the correct perspective on the location of Hawaii.
- Prompt student thinking and ask students:
    - How did the USDA decide on these grow zones?
    - What do they think was the biggest factor-temperature or rainfall?
    - Where would you always find liquid water?
    - Where would you find solid and liquid water?
    - Where would you always find solid water?
        - Teacher Note: Connect back to states of matter and explain to students that in extreme cold water bodies are mostly frozen, in moderate regions water bodies are sometimes frozen and sometimes liquid, and in warm regions water bodies are always liquid. Use the Grow Zone Legend to help identify patterns.

Resources:

- Agree Disagree Line Claims
- koa tree information for teachers only!
- USDA grow zone map and legend
- Slideshow (Slide #10)

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations

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- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: temperature, thermometer, heat, cool, plant, living, ecosystem, life, survive, grow, species, drought, habitat, drought-resistant, grow-zone

ELABORATE (Applications / Extensions)

Activity Description:

- Refer back to the school yard garden plot maps (generated in G2 U2 LS2).
- Show Slide #1 from the *Citrus Tree Slideshow.*
- May be done as a whole class or small groups with Slides #3-#7 printed for each group.

Resources:

- Citrus Tree Slideshow

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Obtaining, Evaluating, and Communicating Information; Engaging in Argument from Evidence; Planning and Carrying Out Investigations*
- ❏ **DCI:** *LS2.A: Interdependent Relationships in Ecosystems; LS4.D: Biodiversity and Humans; ESS2.C: The Roles of Water in Earth's Surface Processes*
- ❏ **CCC:** *Patterns*

Summative Assessment Description(s)

- Assess student claims on the Elaborate activity.
- Help students to track their learning over the course of the unit with the *Summary Table*. The *Summary Table* should be completed at the end of each learning sequence.

Resources:

- Summary Table

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Additional Resources: ● G2 Unit Materials List ○ Click on specific tab for unit-specific materials

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Learning Sequence 4A

Brief Description:
Students watch videos of animals pollinating flowers. They observe and generate questions about what is happening. Students then closely observe bees and determine the structure and function of bees that are involved in pollination. By the end of the lesson students review the koa flowers structure and the structures of various animals and determine which animal was most likely to pollinate the koa flower.

Suggested Pacing:
2.5 - 3 hrs

Lesson-Level Phenomenon/Design Problem:
Pollination Video

Relationship to Anchoring Phenomena/Design Problem:
Animals and other forces help plants pollinate and/or move their seeds from place to place.

Learning Sequence Driving Question:
How do plants depend on animals?

Student Expected Outcomes:
- Students will investigate how animals help plants in pollination.
- Students will create a model to demonstrate how pollination happens.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Developing and Using Models • Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)	**Structure and Function** • The shape and stability of structures of natural and designed objects are related to their functions. . (2-LS2-2)

Related Performance Expectation(s) in this Unit:
- 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*

Possible Common Core State Standards Connections:

ELA/Literacy —
- SL.2.5 Create audio recordings of stories or poems; and drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-LS2-2)

Mathematics —
- MP.4 Model with mathematics. (2-LS2-2)

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- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-LS2-2)

Prior Student Knowledge:
K.ETS1.A

Possible Preconceptions/Misconceptions:

- Students consider large animals to be the main characters in an ecosystem. They do not understand the roles of smaller organisms in the success of an ecosystem.
- Students assume all ecosystems are composed of the same plants and animals. They do not realize that different regions have different species.

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)
Activity Description:

- Students watch the *The Beauty of Pollination Video*.
    - Observe animals helping plants and record your observations on the *Observations of Animals Helping Plants Worksheet*.
- Students pair-share their observations and choose two observations of animals helping plants to share with the whole class along with an initial explanation of how the animal is helping the plant.
    - Students may not have the correct terminology to share their initial ideas. Please only introduce pollination as a means of animals helping plants. Do not define the word further for the students, we want them to make sense of the idea in their own time.
- Students generate questions about what they saw in the video.
    - Possible student questions could include:
        - What is the dusty stuff?
        - What are the animals doing?
        - What body parts are being used?
        - What does this do for the plant? Does it harm the plant?
    - Guide student questions to include:
        - What is pollination?
        - Why is pollination important?
    - Scaffold student questioning to promote the concepts of structure and function.
        - What kinds of animals pollinate flowers?
        - What parts of the animals and plants are involved in pollination?

Resources:

- The Beauty of Pollination Video
- Observations of Animals Helping Plants Worksheet

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

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- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description: *(these explorations may be completed over several days)*

- Students watch the *Bee Pollinating Flowers Video* on a loop in the classroom.
- As the video runs, students complete the *Pollen Delivery Activity* to explore a variety of textured materials to determine which textures are the best at collecting "pollen" (baking soda).
    - Ask the students to share their ideas about the different textures and how effective they were in collecting and delivering pollen.
    - Help the students to begin to connect the ideas that the textures found on the bees (and other animals who pollinate) are not a coincidence, and that those textures serve a specific function.
    - **This exploration is adapted from engineering is elementary*

Resources:

- Bee Pollinating Flowers Video
- Pollen Delivery Activity
- Flower sheets (print for use in Pollen Delivery Activity)

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Students read *Bees and Flowers* by Kevin Cunningham.
- Students discuss how this book connects to their Explore activity.
- As a class, make observations of the structures on a honeybee (specimen with magnifying lense or picture - Slide #1 from the *Structure and Function Slides*) and a flower (specimen or picture - Slide #2 from the *Structure and Function Slides*).
    - Draw each part on the board or show slide #3 and #5 from the *Structure and Function Slides*
        - Teacher note: The actual vocabulary is NOT the focus but can be included:
            - Petals - colorful, attract animals, protect the pistil and stamens.
            - Pistil - the female part of the flower that has a sticky top and ovules in the base, (produces the seeds).
            - Stamen - the male part of the flower that produces the pollen.

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- Pollen - the plant's male reproductive cells.
- Pollination - the transfer of pollen from the stamen to the pistil of the same flower or different flowers of the same kind of plant.

- Students review the labeled diagrams of the structures and relate those structures to pollination.
- Students complete the *Pollination Model*. Students add zoom-out boxes to describe how the bee and flower work together for pollination, and explain how the bee's parts and plant's parts help in the pollination process.

Resources:

- Bees and Flowers by Kevin Cunningham on epic! Books
- Structure and Function Slides
- Additional resources on epic! Books
  - *National Geographic Readers: Bees* by Laura Marsh
  - Insect Pollinators by Jennifer Boothroyd
  - What Is Pollination? by Bobbie Kalman
  - Incredible Insect Pollination video
  - Who Are Flowers Trying to Attract? Video by MinuteEarth
  - SciShow Kids: Pollination: How Bees Help Make Fruit! video
- Pollination Model

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: Pistil, stamen, petal, stem, flower, pollen, pollination, pollinate, structure, function, plant, grow, seed, insect, nectar, reproduction, abdomen, thorax, pollen basket, antennae

ELABORATE (Applications / Extensions)

Activity Description:

- Students read the text *Flowers are Calling* by Rita Gray or *Animal Pollinators* by Jennifer Boothroyd.
- Students discuss their observations about structures and functions of each of the animals that are seen pollinating the flowers. Then reverse the discussion and allow the students to take notice of the plants structures and how the plant is suited to the characteristics of the animal used to pollinate the flower.
- Ask students:
  - What adaptations do flowers have to help make sure they get pollinated by animals?
    - Shape - wide open (wind), narrow passages (animals)
    - Color and patterns - make flowers easy to see.
    - Smell - sweet smell draws animals

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        - Nectar- sugar and sweet taste
    - What adaptations do animals have in order to pollinate the flowers?
        - Furry bodies
        - Tongue shapes
        - Beak shapes
        - Pollen baskets
- Provide students with the *Koa Tree Pollination Worksheet*. In this assessment, students are asked to identify which creature would pollinate a koa flower. Students must use structure and function evidence to back up their claim.

Resources:
- *Flowers are Calling* by Rita Gray (available on YouTube)
- Animal Pollinators by Jennifer Boothroyd
- Koa Tree Pollination Worksheet

Teacher Action(s):
- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):
- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Developing and Using Models*
- ❏ **DCI:** *LS2.A: Interdependent Relationships in Ecosystems*
- ❏ **CCC:** *Structures and Functions*

Summative Assessment Description(s)
- Assess student claims on the Elaborate activity.
- Help students to track their learning over the course of the unit with the *Summary Table*. The *Summary Table* should be completed at the end of each learning sequence.

Resources:
- Summary Table

Additional Resources:
- G2 Unit Materials List
    - Click on specific tab for unit-specific materials

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Learning Sequence 4B

Brief Description:
Students learn that plants depend on animals to move their seeds around (dispersal) and how the characteristics of a seed aid in its dispersal. Plant seed structures serve the function of their seed dispersal needs and type.

Suggested Pacing:
3 - 3.5 hrs

Lesson-Level Phenomenon/Design Problem:
Video of apples growing from a pollinated flower, picture of deer eating apples, and apple dissection

Relationship to Anchoring Phenomena/Design Problem:
Animals and other forces help plants pollinate and/or move their seeds from place to place.

Learning Sequence Driving Question:
How do plants depend on animals?

Student Expected Outcomes:

- Students will investigate how animals help plants in seed dispersal.
- Students design a simple sketch or physical model to show how the shape and properties of a seed help it move to a location where it can grow.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Developing and Using Models • Develop a simple model based on evidence to represent a proposed object or tool. **Planning and Carrying Out investigations** • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on animals for pollination or to move their seeds around. **ETS1.B: Developing Possible Solutions** • Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary)	**Cause and Effect** • Events have causes that generate observable patterns. **Structure and Function** • The shape and stability of structures of natural and designed objects are related to their function(s).

Related Performance Expectation(s) in this Unit:

- K-2ETS-1-2: Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

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- 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*

Possible Common Core State Standards Connections:

ELA/Literacy —

- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)(2-LS2-2)

Mathematics —

- MP.4 Model with mathematics. (2-LS2-1)(2-LS2-2)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-LS2-2)

Prior Student Knowledge:

K.ETS1.A

Possible Preconceptions/Misconceptions:

- Students consider large animals to be the main characters in an ecosystem. They do not understand the roles of smaller organisms in the success of an ecosystem.
- Students assume all ecosystems are composed of the same plants and animals. They do not realize that different regions have different species.
- Students may not realize that pollination leads to seed formation
- Students will think of nuts and fruit/vegetables as food, not as seeds.

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Students watch the *Flower to Fruits (Apple Timelapse)* video of apples growing from a pollinated flower (this is a direct connection to lesson 4A)
- Students watch the *Apple Life Cycle* video and view the *Picture of Squirrel Eating Apple.*
- Students complete an apple dissection, and if needed, watch the *Apple Dissection Demonstration*.
    - Allow students to view the different parts of the apple and count the number of seeds inside the apple. Remind them of the taste of apples from eating them in the past (Safety Note: Do not allow students to taste the apples. Eating food as part of a science lesson is never permitted.)
- Prompt students:
    - Why are the seeds embedded in such a "yummy" fruit?
    - How does having the seeds in the fruit help the plant move its seeds to a new location?
    - Why would a plant want the seeds to move to a new location? What are some other ways plants move their seeds?

Resources:

- Flower to Fruits (Apple Timelapse)
- Apple Life Cycle video
- Picture of Squirrel Eating Apple
- Apple Dissection Demonstration

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Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

- Teacher sets up one picture and one *I Notice/I Wonder Chart* at 5 separate stations around the room.
    - Each station will have a different example of how plants and animals work together to distribute seeds.
        - ***Station 1****: Sock with seeds stuck to it.*
        - ***Station 2****: Picture of an animal with seed stuck to it*
        - ***Station 3****: Video of a squirrel burying a seed*
        - ***Station 4:*** *Picture of a bird with seed in beak*
        - ***Station 5:*** *Picture of ant moving a seed*
    - While photos/videos of the seed and animal interactions will work, supplying hands-on experiences with seeds at each station would be beneficial for students to consider the structures and functions of the seeds.
- Students work in small groups to add comments to the *I notice, I wonder* chart at each station.
- After visiting each station, have students share their observations and questions in a discussion circle.

Resources:

- **Station 1**: Picture of a Sock with seeds stuck to it.
- **Station 2**: Picture of an animal with seed stuck to it
- **Station 3**: Video of a squirrel burying a seed
- **Station 4:** Picture of a bird with seed in beak
- **Station 5:** Picture of an ant moving a seed
- I notice, I wonder Chart

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas

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- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- The class reads the *Seed Dispersal Texts* listed in Resources.
- Students view the *Seed Dispersal Slideshow*.
- Students examine a variety of seeds (purchase a seed dispersal set or compile your own seeds) using magnifying glasses.
    - Students identify features in each seed that would help it travel in a specific way.
    - Students place the seeds in the correct box on the *How Do Seeds Move? Worksheet.*
    - Students share their seed dispersal determinations and evidence.
    - Scaffold the discussion so that students gain access to appropriate vocabulary use in their descriptions.
- If available, students examine the koa seeds or show Slide #4 in the *Seed Dispersal Slideshow*.
    - Students work in small cooperative groups to observe the seed's structures.
    - Students participate in a *Discussion Diamond Activity* to come to consensus on the mode of dispersal for the koa seed.
        - Students write their initial ideas on their corner, discuss their ideas with the whole group, and determine what content to include in the center of the diamond.
    - Student groups share their decisions and rationales with the whole class.
    - Share with the students that in order for the koa seed to sprout into a seedling, the seed coat must be scratched.
    - Ask students how the different types of seed dispersal may help with scratching the seed coat.
    - *Optional - Consider sprouting one of the koa seeds by scratching it with tweezers or nail clippers and placing it in a plastic bag with a moist paper towel in the window. Heavier seeds are more likely to sprout than lighter seeds. By sprouting the koa, you will be able to bring the seedling into the engagement exercise in learning sequence 5.*

Resources:

- Seed Dispersal Texts:
    - Planting the Wild Garden by Kathryn Osebold Galbraith on epic! Books
    - Who Will Plant a Tree? by Jerry Pallota on epic! Books
    - *Flip, Float, Fly: Seeds on the Move* by Joann Early Macken (may be available as a YouTube read aloud)
- Seed Dispersal Slideshow
- Teacher Resource: Pictures of possible seeds to collect
- How Do Seeds Move? Worksheet
- Discussion Diamond Activity

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations

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- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: seed, seedling, fruit, pollen, pollination, dispersal, wind, float

ELABORATE (Applications / Extensions)

Activity Description: Engineer a model seed

- Students complete the *Seed Engineering Challenge* using a variety of arts and crafts materials to design, build and test a seed model for the following scenario:
  - There is a seed on a desert island. The island is overcrowded and there is no space for more plants to grow. The next closest island is 60 miles away. Design a way for your seed to survive and grow on the next island without human help.
  - Optional : Teachers may develop other unique scenarios with various plant needs and locations to allow different groups to embed different dispersal types.
- Students must rationalize their designs and test their solutions, like an engineer would do in the real world. Remind students that engineers rarely get their desired outcome on the first try. They often have to redesign their ideas incorporating what they learn during each trial to eventually solve their problem.

Resources:

- Seed Engineering Challenge

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Developing and Using Models; Planning and Carrying Out Investigations*
- ❏ **DCI:** *LS2.A: Interdependent Relationships in Ecosystems; ETS1.B: Developing Possible Solutions*
- ❏ **CCC:** *Cause and Effect; Structures and Functions*

Summative Assessment Description(s)

- Seed Design Challenge from Elaborate

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- Help students to track their learning over the course of the unit with the *Summary Table*. The *Summary Table* should be completed at the end of each learning sequence.

Resources:

- Summary Table

Elaborate Further / Reflect / Enrichment:

- Sock Walk: Have children tuck their pants into their socks, keeping their shoes on! Take them for a walk in a grassy or wooded area. As students walk, have them look at different plants and what kinds of seeds you see. Pick up larger seeds and have students place them in a paper bag. When the students return to the classroom have students examine closely their socks and pants. Use magnifying glasses to see the seeds close up, draw and record the structures that allowed the seed to stick to their socks. Use a lint roller to remove seed and insects (i.e. ticks) from student clothing.

Additional Resources:

- G2 Unit Materials List
    - Click on specific tab for unit-specific materials

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Learning Sequence 5

Brief Description:
Students observe romaine lettuce or other frost sensitive plants to see how below freezing temperatures and climate impact plants.

Suggested Pacing:
1.75 - 2.25 hrs for the 5Es
0.5 - 1 hr for the Culminating Performance Task

Lesson-Level Phenomenon/Design Problem:
Fresh leaves of romaine vs frozen leaves of romaine

Relationship to Anchoring Phenomena/Design Problem:
Reunion Island and Hawaii are both tropical locations. The koa tree needed a tropical habitat in order to grow. Areas that are too cold and freeze water will limit what plants can grow there.

Learning Sequence Driving Question:
How does water and temperature determine if a koa seed survives?

Student Expected Outcomes:

- Students will construct an explanation using evidence about how heating and cooling a substance may cause changes that can be observed, sometimes the changes can be reversible, sometimes not.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Engaging in Argument from Evidence • Construct an argument with evidence to support a claim.	**ESS2.C: The Roles of Water in Earth's Surface Processes** • Water is found in the ocean, rivers, lakes, and ponds. • Water exists as solid ice and in liquid form. **PS1.B: Chemical Reactions** • Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.	**Cause and Effect** • Events have causes that generate observable patterns.

Related Performance Expectation(s) in this Unit:

- 2-ESS2-3: Obtain information to identify where water is found on Earth and that it can be solid or liquid.
- 2-PS1-4: Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
    - [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking

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an egg, freezing a plant leaf, and heating paper.]

Possible Common Core State Standards Connections:

ELA/Literacy —

- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-PS1-4)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-PS1-4)
- RI.2.8 Describe how reasons support specific points the author makes in a text. (2-PS1-4)
- W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. (2-PS1-4)

Prior Student Knowledge:

N/A

LESSON PLAN – 5-E Model

Prior Preparation for Learning Sequence 5

Engage

- Freeze romaine lettuce or celery prior

Explore:

- Freeze romaine lettuce or celery
- Place a piece of romaine/celery in colored water at least a full day before the activity

Explain

- Freeze water in ice cube tray or 3 ounce paper cup

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Teacher Note: be sure to have frozen romaine lettuce or celery
- Students review the *Koa Tree Fact Sheet*, making note of the fact that freezing or cold weather can impact a seedling's growth.
- Show students a fresh leaf of romaine and a frozen piece of romaine (or some comparable plant like celery).
- Students turn and talk to predict ways in which freezing might impact a plant or seedling, and then pairs share their ideas with the whole class.

Resources:

- Koa Tree Fact Sheet

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

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Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

Part #1:

- Teacher note: Be sure to have prepared (fresh, frozen, microwaved and colored) romaine lettuce or celery
- Students examine a fresh romaine leaf/celery stalk, a previously frozen leaf/ stalk and a microwaved leaf/stalk and complete *Explore Activity*.
    - May use hand lens
    - Identify the similarities and differences.

Part #2:

- Students participate in an *Agree/Disagree Line* with the two statements (Slide #2 and #3 in *Explore Activity*) posted on either side of the classroom:
    - Romaine lettuce/Celery CAN be returned to its original state
    - Romaine lettuce/Celery CANNOT be returned to its original state
- Students move to the statement they agree with and discuss with their like-minded classmates why they believe the statement is accurate and come up with evidence to support their claim. (Remember the Hershey Kiss activity (LS3) from the 4th Little Pig.)
- Each claim group shares their ideas and evidence with the class. If after the sharing someone wishes to change positions, they may do so.
- As a class, brainstorm together other examples of how adding heat and cold changes an original form (i.e., snowman melting, cake batter to cooked cake, popcorn kernels to popcorn, etc), and ask students if the change can be reversed.

Part #3:

- As a class, record observations from Part #1 on the triple venn diagram on Slide #4 of the *Explore Activity* and discuss why there are differences in the leaves/stalks and their structure.
    - Scaffold the discussion to include water.
- Use the piece of romaine/celery that is in the colored water to show how plants have water in their bodies.
    - Ask students to predict if the water played a role in how the different leaves/stalks looked and felt?
    - Was it only the water that played a role in the changes in the romaine leaf/celery stalk?
    - What other factors may have played a role in the changes?
    - Continue to prompt students until the idea of temperature is brought into the discussion.

Resources:

- Explore Activity
    - Agree/Disagree Line Directions

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems

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- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Teacher note: Be sure to have prepared frozen and liquid water in ice cube tray or cup
- Students compare the ice cube tray/cup of frozen water to liquid versions to predict how those differences might impact a plant/seed.
    - An alternative way to do this could be done with students measuring a volume of water and marking the cup with a permanent marker, then freezing it and seeing where the water level is in the container once it is a solid
- Teacher explains the causes of the damage which is due to expansion of water (up to 9%) when it freezes and points out that the frozen cubes are mounded and taller than the liquid form.
    - *Teacher background information:* Damage occurs to the plants because water in the cells expands when it freezes and ruptures the cell walls. The cell walls give the leaf structure when filled with fluid. When the cell walls break the fluids escape, causing the leaf to become wet to the touch, as well as limp. (Imagine a stack of water balloons filled, then poke some holes in them, water drains out and limp balloons remain.) The vocabulary terms cell and cell wall do not have to be introduced to students. Help students to understand that just like the balloon, water is held in little "pockets" inside the plant. If the water expands it breaks the pockets and weakens the leaf.

Resources:

- Teacher background information

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: frozen, thaw

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ELABORATE (Applications / Extensions)

Activity Description:

- Students look at maps of the world showing Hawaii, Reunion and Connecticut found in the *Slideshow* (used in LS3).
- Students discuss the different types of weather in Connecticut.
    - Is the koa tree sensitive to freezing? Can we grow a koa tree in Connecticut?
    - Where do you think water will freeze on Earth?
- Prompt deeper student thinking by prompting:
    - What adaptations do plants have to prevent the weather in an area from damaging the plants?
    - Where on earth does water not freeze?
    - How could we grow a koa tree in connecticut?
    - If cold weather impacts plants, do you think hot weather impacts plants?
    - How do plants respond to hot weather?

Resources:

- Slideshow

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Engaging in Argument from Evidence*
- ❏ **DCI:** *ESS2.C: The Roles of Water in Earth's Surface Processes; PS1.B: Chemical Reactions*
- ❏ **CCC:** *Cause and Effect*

Summative Assessment Description(s)

- Help students to track their learning over the course of the unit with the *Summary Table*. The *Summary Table* should be completed at the end of each learning sequence.

Resources:

- Summary Table

Culminating Performance Task:

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- Students will create a *Final Explanatory Model*, with zoom out boxes, that describes why the koa can exist in both Hawaii and Reunion, a prediction of how the seed was able to travel to Reunion Island using evidence learned from seed dispersal and pollination sequences. Students should also explain why the koa does not grow in other regions such as Connecticut.

Resources:

- Final Explanatory Model

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Unit 3 - Beavers

The beaver is the largest rodent in North America. One of the most notable traits of this species, however, is not its size but its ability to transform its environment to suit itself. Most animals have at least some effect on the environment around them. Spiders weave webs to catch passing insects. Woodpeckers chip cavities in the trunks of trees to build their nests. But few animals (except for humans) have as much of an impact on their environment as the beaver does. In fact, a single family of beavers can in a matter of weeks turn a small, rushing stream into acres of deep, still, interconnected ponds, creating a wetland that would otherwise not exist.

Besides humans, beavers are the only species on earth that know how to construct dams. Scientists often refer to beavers as the engineers of the animal world. But unlike humans, who must be taught how to design and build dams, beavers know instinctively how to interweave sticks to create a strong and durable structure and how to seal a dam with mud to make it impermeable to water. They are born knowing how, just as birds know how to sing songs or build nests without ever having done so.

A beaver's work is critical to the survival of its family. The deep ponds that beaver dams create offer refuge from predators and from the freezing temperatures of winter. As long as a beaver dam is tall enough and the resulting pond deep enough, a family of beavers will have underwater access to food throughout the winter.

Perhaps more importantly, beaver dams and ponds provide habitat that wouldn't otherwise exist for many other species. Ducks, geese, herons, turtles, and frogs are just a few of the species that benefit from the deep and wide waterways that beavers create. Unfortunately, this is where the dam-building accomplishments of beavers and humans diverge. While small ponds constructed by humans can be just as beneficial as a beaver pond, huge dams, including the Hoover Dam, serve more often to flood vital habitat than to create it. Dams as large as this create incredibly deep reservoirs that lack the diversity and richness of the ecosystems created by beavers.

Throughout this unit, students explore the natural processes of weathering and erosion at the hands of beavers other natural phenomena including water and wind. Students will investigate these events through the lenses of both quick and slow change. Throughout the sequences, students will gain an understanding of how landforms and water features change as a result of beavers (water) and wind. Students will be exposed to photos, videos, and maps that illustrate these ideas. Students will experience the core ideas by investigating, constructing models, constructing explanations, and designing solutions.

Just as beavers engineer dams, so do humans. The function of a human designed dam is different from a beaver dam. A man-made dam is a barrier that stops or restricts the flow of water or underground streams. Reservoirs created by dams not only suppress floods but also provide water for activities such as irrigation, human consumption, industrial use, aquaculture, and navigability. Hydropower is often used in conjunction with dams to generate electricity. A dam can also be used to collect water or for storage of water which can be evenly distributed between locations. Dams generally serve the primary purpose of retaining water, while other structures such as floodgates or levees (also known as dikes) are used to manage or prevent water flow into specific land regions.

Beaver dams can reduce the effects of erosion along a stream bed or riverbed. Significant erosion occurs along ditches and water runways but there were some areas where erosion was minimal. Where there are beaver dams, the erosion is much less severe. Dams will form ponds about 2 meters deep. During the summer water evaporates and seeps out. This allows the subsequent heavy rainfall to be contained, filling the pond to overflow levels, keeping water on the land longer, slowing stream flow and reducing erosion. Without slowing fast waters from the spring melt or storms, excessive sedimentation, caused by erosion, can cover aquatic plants and wildlife living along the natural l water bodies or even fill in these areas and destroy adjoining wetlands. Beaver dams help maintain healthy ecosystems by reducing the effects of erosion and allowing plant species to thrive along river banks, therefore protecting against erosion even further.

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To access the flowchart for this unit, click here.

Suggested Pacing:
11-12 hrs

Anchoring Phenomenon/Design Problem:
Beavers - Nature's Engineers

Unit Driving Question:
How do beavers change the landscape?
How do we prevent wind or water from changing the land?

Culminating Performance Task:

- Students will create a map of Beaver Falls, which includes aspects from each of the learning sequences: beaver dam information, engineering content, landforms, erosion and map symbols.

NGSS Performance Expectation(s): (Hyperlinks will bring reader to NGSS Evidence Statements)

- 2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
  - [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.]
  - [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]
- 2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*
  - [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]
- 2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.
  - [Assessment Boundary: Assessment does not include quantitative scaling in models.]
- K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Three Dimensions that form the Foundation for these NGSS Performance Expectations:

Science & Engineering Practices:

Constructing Explanations and Designing Solutions

- Make observations from several sources to construct an evidence-based account for natural phenomena.
- Compare multiple solutions to a problem.

Developing and Using Models

- Develop a model to represent patterns in the natural world.

Analyzing and Interpreting Data

Disciplinary Core Ideas:

ESS1.C: The History of Planet Earth

- Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.

ESS2.A: Earth Materials and Systems

- Wind and water can change the shape of the land.

ESS2.B: Plate Tectonics and Large-Scale System Interactions

- Maps show where things are

Crosscutting Concepts:

Stability and Change

- Things may change slowly or rapidly.

Patterns

- Patterns in the natural world can be observed.

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• Analyze data from tests of an object or tool to determine if it works as intended.	located. One can map the shapes and kinds of land and water in any area. **ETS1.C: Optimizing the Design Solution** • Because there is always more than one possible solution to a problem, it is useful to compare and test designs. *(secondary)*	

Possible Common Core State Standards Connections:

ELA/Literacy —

- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)(2-ESS2-1)
- RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1)(K-2-ETS1-3)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)(K-2-ETS1-3)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1) (2-ESS2-2)(K-2-ETS1-3)
- MP.4 Model with mathematics . (2-ESS1-1)(2-ESS2-2)(K-2-ETS1-3)
- MP.5 Use appropriate tools strategically. (2-ESS2-1)(K-2-ETS1-3)
- 2.NBT.A Understand place value. (2-ESS1-1)
- 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
- 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-3)

PROGRESSION OF LEARNING

Learning Sequence 1

- **Learning Sequence Driving Question**
  - How do beavers change the landscape?
- Learning Sequence 1

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- **Relationship to Anchoring Phenomena/Design Problem**
  - This is the introduction to the anchoring phenomenon.
- **Student Expected Outcomes:**
  - Students will share their ideas about beavers and their homes and the impact of the species on the landscape.
  - Students will model their initial ideas about how beavers impact a forest or ecosystem (this is based on prior knowledge or experiences).
  - Students will generate questions about beavers and their role as ecosystem engineers.

Learning Sequence 2

- **Learning Sequence Driving Question**
  - Why do beavers need dams?
- Learning Sequence 2
- **Relationship to Anchoring Phenomena/Design Problem**
  - A beaver's work changes the land for their survival, but also has far reaching impacts on the surrounding environment.
- **Student Expected Outcomes:**
  - Students will explore the similarities (patterns) in human and beaver homes.
  - Students will make observations from several sources to identify the animals that benefit from beaver dam construction.

Learning Sequence 3

- **Learning Sequence Driving Questions**
  - What is an engineer? How are beavers nature's engineers?
- Learning Sequence 3
- **Relationship to Anchoring Phenomena/Design Problem**
  - Students compare and contrast the world's two main dam engineers: humans and beavers and the structures each builds.
- **Student Expected Outcomes:**
  - Students will identify the characteristics of an engineer.
  - Students will compare and contrast (patterns) beaver and human designed dams.
  - Students will make observations from a map showing the world's largest beaver dam and compare those observations to an aerial photo of the Hoover dam.

Learning Sequence 4

- **Learning Sequence Driving Question**
  - How do rivers and dams change the land? How quickly does this happen?
- Learning Sequence 4
- **Relationship to Anchoring Phenomena/Design Problem**
  - Beaver and human dams change the flow of water and the overall timeline of erosion.
- **Student Expected Outcomes:**
  - Students will investigate and observe erosion due to water.
  - Students will construct a model to explain how time and water impact the shape of the land.

Learning Sequence 5

- **Learning Sequence Driving Question**
  - What are the other ways that landforms can be created, besides erosion along river beds?
- Learning Sequence 5

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- **Relationship to Anchoring Phenomena/Design Problem**
  - Students will generate a map of Beaver Falls (a fictional location) and identify landforms and features relative to the region of a beaver dam. Students will map their ideas using mapping symbols and tools learned in the sequence.
- **Student Expected Outcome:**
  - Students will develop and use models to represent the patterns of land and water in an area.

Assessments:

- **Culminating Performance Task**
  - Students will make a map of a fictional location called Beaver Falls. Let students know that their map must include the following:
    - beaver dam
    - variety of landforms and types of water bodies (relevant to the area - as beavers created wetlands, a desert is probably not applicable and should not be included). Each landform should have an explanatory feature:
      - The _____ is near the _____ because_____
    - other explanatory features describing how the landscape has changed relative to the beaver dam.
    - a key
  - Students Gallery Walk with Post-its to add comments to each of their peer's maps. Revise maps as needed based on peer feedback.
  - *Resources*
  - Gotta Have It Checklist

- Grade 2 Performance Expectation Rubrics and Prompts
- Elementary Assessment Resource

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials
- EPIC! Digital Library - G2 U3 List
  - Includes ebooks and videos
  - Must have an educator user account for free access
- Teacher Resources
  - Video on beavers for greater background content.
  - *Background content adapted from PBS Learning Media*
  - Beavers

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Learning Sequence 1

Brief Description:
Students will model their understanding of beavers and predict how they impact the landscape.

Suggested Pacing:
0.75 - 1.25 hrs

Lesson-Level Phenomenon/Design Problem:
Beaver Slideshow and Corresponding Discussion

Relationship to Anchoring Phenomena/Design Problem:
This is the introduction to the anchoring phenomenon.

Learning Sequence Driving Question:
How do beavers change the landscape?

Student Expected Outcomes:

- Students will share their ideas about beavers and their homes and the impact of the species on the landscape.
- Students will model their initial ideas about how beavers impact a forest or ecosystem (this is based on prior knowledge or experiences).
- Students will generate questions about beavers and their role as ecosystem engineers.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Developing and Using Models ● Develop a model to represent patterns in the natural world.	**ESS2.B: Plate Tectonics and Large-Scale System Interactions** ● Maps show where things are located. One can map the shapes and kinds of land and water in any area.	**Patterns** ● Patterns in the natural world can be observed.

Related Performance Expectation(s) in this Unit:

- 2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.
  - [Assessment Boundary: Assessment does not include quantitative scaling in models.]

Possible Common Core State Standards Connections:

ELA/Literacy —

- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1) (2-ESS2-2)(K-2-ETS1-3)
- MP.4 Model with mathematics. (2-ESS1-1)(2-ESS2-2)(K-2-ETS1-3)
- MP.5 Use appropriate tools strategically. (2-ESS2-1)(K-2-ETS1-3)

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- 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)

Prior Student Knowledge:
K.ETS1.A

Possible Preconceptions/Misconceptions:
- Land always stays the same
- Water can't move something heavy, such as sand or rock

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)
Activity Description:
- Students share what they know about beavers.
- As a class, students create an anchor chart of their initial ideas about beavers (using Slide #1 to prompt ideas).
- Scaffold the discussion to include ideas about beaver homes (using Slide #2 to prompt ideas).
    - Beavers engineer their homes just like students did for the 4th Little Pig.

Resources:
- Slideshow

Teacher Action(s):
- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):
- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)
Activity Description:
- As a class, students discuss Slides #3 and #4 from the *Slideshow* to predict how the beaver will change the forest.
- Students work in small groups to draw an initial model of how beavers change forests or landscapes
    - Provide students with a print out of Slide #5. These can be printed on 11x17 paper.
- Students share their ideas with the whole class.
- Class completes an I Notice/I Wonder chart from Slide #6 based on their observations and shared ideas.

Resources:
- Slideshow

Teacher Action(s):
- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact

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- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

Additional Resources:

- G2 Unit Materials List
    - Click on specific tab for unit-specific materials

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Learning Sequence 2

Brief Description:
Students draw a picture of their home and label the parts of their home that help them live, grow and survive. Students compare the parts of their home to the parts of a beaver complex including the beaver pond, dam, lodge and food cache. Students also research/investigate how the beaver's complex can become home to many other living things.

Suggested Pacing:
2 - 2.5 hrs

Lesson-Level Phenomenon/Design Problem:
My house-students describe how their homes protect them and provide what they need to live,grow, and survive.

Relationship to Anchoring Phenomena/Design Problem:
A beaver's work changes the land for their survival, but also has far reaching impacts on the surrounding environment.

Learning Sequence Driving Question:
Why do beavers need dams?

Student Expected Outcomes:
- Students will explore the similarities (patterns) in human and beaver homes.
- Students will make observations from several sources to identify the animals that benefit from beaver dam construction.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Constructing Explanations and Designing Solutions ● Make observations from several sources to construct an evidence-based account for natural phenomena.	**ESS1.C: The History of Planet Earth** ● Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.	**Patterns** ● Patterns in the natural world can be observed.

Related Performance Expectation(s) in this Unit:
- 2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
  - [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.]
  - [Assessment Boundary: Assessment does not include quantitative measurements of timescales.

Possible Common Core State Standards Connections:

ELA/Literacy —

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- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1)
- MP.4 Model with mathematics. (2-ESS1-1)
- 2.NBT.A Understand place value. (2-ESS1-1)

Prior Student Knowledge:

N/A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Students draw a picture of their house.
  - Prompt students to label the parts of the house that help them/their family to live, grow, and survive (this connects to the Koa seed unit).
  - Help students think deeper by prompting them to include their ideas about how their house protects them from weather, helps the family remain safe from predators/unsafe situations, stores food, provides access to water, etc.
- Students share their ideas with the class about what a home offers to help people live, grow, and survive.

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

- Prompt students to share their ideas about why beavers build dams.
  - How does the dam help the beaver get what it needs for survival?
  - How does the dam protect the beaver from predators?

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- Students work in small groups to label the beaver dam and lodge in the *Beaver Model*
    - Students label the beaver's home with similar titles to those found within their homes (i.e., kitchen-food storage, walls and roof-shelter from weather, etc.).
- Students discuss how the beaver's home is similar to their home. Students refer back to their Engage pictures.
    - What are the different parts of a beaver's complex ?
    - What do you think each part of the complex is similar to a human home?
    - Record your ideas.

Resources:

- Beaver Model
- Beaver's complex (resource for teacher)

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

- Read the text *Beavers* by Gail Gibbons (please note that this text was a potential reading in Kindergarten-Unit 1). As the students engage with the text, have them pay attention to the structures and to listen carefully about how that structure helps the beaver live, grow and survive.
    - Show pages 8-9 in *The Beaver's Lodge: Building with Leftovers* by Adam Reingold
- Refer back to the image from the Exploration activity. As a class, identify the structures and how those structures help the beaver grow and survive.
    - Add ideas that relate the portions of the beaver complex to the parts of our homes. Identifying these similarities and patterns will help students better retain the importance of each of the structures in the beaver's complex.

Resources:

- Beavers by Gail Gibbons (available on epic! Books)
- The Beaver's Lodge: Building with Leftovers by Adam Reingold on epic! Books

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

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Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: lodge, dam, beaver, food cache, beaver pond, lodge floor, walls, roof, air vent, tunnel, plunge holes, wetland

ELABORATE (Applications / Extensions)

Activity Description:

- Teacher Background Information: Beavers, as nature's engineers, are responsible for the creation of beaver ponds and wetlands. Beavers are a keystone species, meaning that the ecosystems would not be the same without them. The ecosystem is dependent on the species for maintaining ecosystem sustainability. These wetlands are home to a variety of species, such as muskrats, deer, geese, frogs, bears, wood ducks, raccoons, birds, and porcupines. Just as beavers and humans need homes to provide shelter, food, water and protection, so do other animals in the beaver pond ecosystem (see page 8 and 9 in Gibbons Beaver book).
- Students work in small groups to access epic! Books to find *Beavers* by Gail Gibbons or other books on beavers
- Groups generate a list of animals that live in the beaver pond and wetland area.
    - Connect to Koa Tree Unit - LS4.D: There are many different kinds of living things in any area, and they exist in different places on land and in water
- Students complete either slide #2 or #3 in the *CER Slideshow* then share their ideas with the class and as they are sharing, complete slides #4 and #5 together.
    - Ask the students to share their claims, evidence and reasoning with the class.
    - As the students present their ideas, add pictures of animals that students deem a part of the beaver pond ecosystem to a large anchor chart/slideshow.

Resources:

- Beavers by Gail Gibbons (available on epic! Books)
- CER Slideshow
- Watchable Wildlife (additional resource, if needed)

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments

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- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** Constructing Explanations and Designing Solutions
- ❏ **DCI:** *ESS1.C: The History of Planet Earth*
- ❏ **CCC:** *Patterns*

Summative Assessment Description(s)

- Student claims generated in the Elaborate activity.

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Learning Sequence 3

Brief Description:
Students identify the characteristics of the engineering design process and use those characteristics to make a claim (supported by evidence) as to whether or not a beaver is an engineer. Students engage in a small engineering design project and explore human-designed dams and beaver-designed dams.

Suggested Pacing:
3 - 3.5 hrs

Lesson-Level Phenomenon/Design Problem:
Agree-Disagree Line - Is a beaver an engineer?

Relationship to Anchoring Phenomena/Design Problem:
Students compare and contrast the world's two main dam engineers: humans and beavers and the structures each builds.

Learning Sequence Driving Questions:
What is an engineer? How are beavers nature's engineers?

Student Expected Outcomes:

- Students will identify the characteristics of an engineer.
- Students will compare and contrast(patterns) beaver and human designed dams.
- Students will make observations from a map showing the world's largest beaver dam and compare those observations to an aerial photo of the Hoover dam.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Constructing Explanations and Designing Solutions • Make observations from several sources to construct an evidence-based account for natural phenomena. **Analyzing and Interpreting Data** • Analyze data from tests of an object or tool to determine if it works as intended.	**ESS1.C: The History of Planet Earth** • Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe **ESS2.A: Earth Materials and Systems** • Wind and water can change the shape of the land. **ESS2.B: Plate Tectonics and Large-Scale System Interactions** • Maps show where things are located. One can map the shapes and kinds of land and water in any area.	**Stability and Change** • Things may change slowly or rapidly. **Patterns** • Patterns in the natural world can be observed.

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	ETS1.C: Optimizing the Design Solution ● Because there is always more than one possible solution to a problem, it is useful to compare and test designs. *(secondary)*	

Related Performance Expectation(s) in this Unit:

- 2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
  - [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.]
  - [Assessment Boundary: Assessment does not include quantitative measurements of timescales.
- 2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*
  - [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]
- K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Possible Common Core State Standards Connections:

ELA/Literacy —

- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1) (2-ESS2-2)(K-2-ETS1-3)
- MP.4 Model with mathematics. (2-ESS1-1)(2-ESS2-2)(K-2-ETS1-3)
- 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-3)

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Prior Student Knowledge:
N/A

Possible Preconceptions/Misconceptions:
- Water does not destroy objects.

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)
Activity Description:
- Use the Agree-Disagree Line strategy to prompt student thinking by posting the *Agree Disagree Claims* on either side of the room.
    - Ask students to stand near the sign that best matches their ideas. If students have a different idea, have them stand wherever it best fits between the two signs.
    - Have the students in the different regions of the room discuss why they agree with the posted statement, or to discuss their ideas if they don't agree with either statement.
    - Students must use reasoning to back up their ideas.
- Ask each student group to share out the major points of their discussion. What was their reasoning for selecting the claim?
    - Make sure the discussion leads students to develop questions about the role of an engineer.
    - Students may think that an engineer needs tools to make or design something. This will be a common misconception. Do not fix the misconception at this point, wait until the explain phase to help students understand that the beaver does have tools that allow it to build and design. The beaver's tools are his tail, teeth, strength and overall body structure.

Resources:
- Agree Disagree Claims
- Agree-Disagree Line strategy

Teacher Action(s):
- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):
- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)
Activity Description:
Students will design and test ways to slow or stop water from moving through a river bed.
- Provide students with the *Engineering a Dam Worksheet*.
- Students work in small cooperative groups to design a LEGO river bed.
    - Students explore their river's water flow by placing their base plate on an incline inside a sink or plastic tray.
    - Students gently pour water down their LEGO designs to observe the water flow through the river bed.
- Once students have generated a working LEGO river, prompt the students to design a way to slow or stop the flow of water down the river bed using LEGO blocks similar to what a beaver does.
    - Students record their ideas FIRST on the worksheet, then decide which to construct and test.

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- Once students have constructed the dam, they should once again observe how water flows through the system. Did the water flow stop or slow at the location of the "dam"? Ask the students to describe if their river dams worked and to provide evidence for their claims.
- Allow student groups to share their designs with the class and to describe the aspects of their designs that worked and the ways that they could improve their designs to make them better in the future.
  - Optional: If time allows, students can redesign their dams based on the information they discussed and retest their new designs.
- Students share their ideas about whether or not they were acting as engineers throughout the exploration.

Resources:

- Engineering a Dam Worksheet

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

Activity Description:

Activity #1: Define the term engineer for the students.

- Use Slide #1 from the *Explain Slideshow* to create an anchor chart with the students to represent the roles of an engineer and the engineering cycle.
  - Solicit student ideas and represent them on the anchor chart.
    - Ideas could include:
      - Solves problems
      - Explores ideas
      - Listens
      - Makes things
      - Creates
      - Makes a plan
      - Improves the plan
      - Thinks and imagines
      - Asks questions
      - Never gives up
- Show Slide #2 from the *Explain Slideshow* and ask students to think about their list of characteristics they used to define an engineer.
  - Make revisions to the anchor chart based on student discussion around the engineering design cycle.
  - Read a text about engineering from the Resources listed below.
  - Students have already engaged in some engineering design with Unit 1, much of this conversation should be recapping their experiences.

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Resources Activity #1:

- Explain Slideshow
- Possible text ideas:
  - How Engineers Find Solutions by Robin Johnson on epic! Books
  - I'll Be An Engineer by Connie Colwell Miller on epic! Books
  - *What do you do with an idea?* or *Engineering: Feats and Failures*

Activity #2: Comparing beaver dam design to human dam design

- Show Slides #3 and #4 from the *Explain Slideshow.*
- Ask the students to discuss the facts about the largest beaver dam and the Hoover Dam listed on the slides.
  - Do any of these facts surprise you? Why?
  - Discuss the timeline for the beaver dam (work in progress for over 40 years) and Hoover Dam (completed in 5 years). How do these timelines compare to other Earth event timelines (i.e., earthquakes, volcanic eruptions, floods)?
    - ESS1.C: The History of Planet Earth Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.
  - Show Slide #5 so that the students can locate the two dams and Connecticut on the map.
    - Note where land and water are on the map.
- Read a text about engineering from the Resources listed below.
- Show the videos for the construction of the Hoover Dam and the beaver dam on Slides #6 and #7 of the *Explain Slideshow*.
  - Ask students to share their ideas about how the engineering design process may be embedded in both beaver and human action in developing and extending dams.
  - Ask students to identify patterns in the behaviors or designs for both the human-made and beaver made dams. Patterns may be similarities and differences.
    - What problems do beavers solve by creating a dam?
    - What problems do humans solve by creating a dam?
    - Are these problems the same or different?
- As a class, complete the *Beaver Dam and Human Dam Double Bubble Thinking Map*.

Resources Activity #2:

- Explain Slideshow
- Possible text ideas:
  - A Dam Holds Back by Crystal Sikkens on epic! Books
  - *How Did They Build That? Dam*
  - The Science of Dams
- Beaver Dam and Human Dam Double Bubble Thinking Map
- Teacher Information-World's largest beaver dam

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers

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- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: engineer, design, construct

ELABORATE (Applications / Extensions)

Activity Description:

Reassessing previous claims

- Ask students to reassess their previous claim using Slide #9 or #10 from the *Explain Slideshow*.
  - Students should use scientific evidence to support their ideas.
- As students work, post:
  - The "What is an engineer" Anchor Chart?
  - The Engineering Design Cycle
  - Graphic Organizer comparing a beaver dam to the Hoover Dam

Resources:

- Explain Slideshow

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** Constructing Explanations and Designing Solutions; *Developing and Using Models; Analyzing and Interpreting Data*
- ❏ **DCI:** *ESS1.C: The History of Planet Earth; ESS2.A: Earth Materials and Systems; ESS2.B: Plate Tectonics and Large-Scale System Interactions; ETS1.C: Optimizing the Design Solution*
- ❏ **CCC:** *Stability and Change; Patterns*

Summative Assessment Description(s)

- Elaborate activity-Student claims, using evidence, are beavers engineers?

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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Learning Sequence 4

Brief Description:
Students compare changes in the land caused by water running through undammed rivers and dammed rivers.

Suggested Pacing:
3 - 3.5 hrs

Lesson-Level Phenomenon/Design Problem:
River Simulation Video

Relationship to Anchoring Phenomena/Design Problem:
Beaver and human dams change the flow of water and the overall timeline of erosion.

Learning Sequence Driving Question:
How do rivers and dams change the land? How quickly does this happen?

Student Expected Outcomes:

- Students will investigate and observe erosion due to water.
- Students will construct a model to explain how time and water impact the shape of the land.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Constructing Explanations and Designing Solutions • Make observations from several sources to construct an evidence-based account for natural phenomena. • Compare multiple solutions to a problem. **Developing and Using Models** • Develop a model to represent patterns in the natural world. **Analyzing and Interpreting Data** • Analyze data from tests of an object or tool to determine if it works as intended.	**ESS1.C: The History of Planet Earth** • Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. **ESS2.A: Earth Materials and Systems** • Wind and water can change the shape of the land. **ETS1.C: Optimizing the Design Solution** • Because there is always more than one possible solution to a problem, it is useful to compare and test designs.	**Stability and Change** • Things may change slowly or rapidly.

Related Performance Expectation(s) in this Unit:

- 2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

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- [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.]
- [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]

- 2-ESS2-1: Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*
  - [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]
- 2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.
  - [Assessment Boundary: Assessment does not include quantitative scaling in models.]
- K-2-ETS1-3: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Possible Common Core State Standards Connections:

ELA/Literacy —

- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1) (2-ESS2-2)(K-2-ETS1-3)
- MP.4 Model with mathematics. (2-ESS1-1)(2-ESS2-2)(K-2-ETS1-3)
- 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
- 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-3)

Prior Student Knowledge:

N/A

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

- Show students the *Simulation of a Flowing River*.
- Ask students to record observations on the I Notice side of an *I Notice, I Wonder Chart*.
- Students work with a peer to devise questions about the simulation.
- Students share their questions with the class.

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- Post questions pertaining to differences in flow of water, changes in river bed shape, depth of the river, width of the river, etc.

Resources:
- Simulation of a Flowing River
- I notice, I wonder chart

Teacher Action(s):
- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):
- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)
EXPLAIN (Concepts Explained / Vocabulary Defined)

Safety Note: Students MUST wear goggles while working with sand and stream tables.

Explore Activity #1:
- Students explore the effects of water on a river bank by conducting an investigation to collect data about the changes to a river. Set up a tub filled with sand (moist) pressed to one side of the tray.
  - Provide students with plastic water bottles and droppers. Ask students to use their fingers to carve a river bed into the sand.
  - Have students measure the width of the river (use measuring tools consistent with current math practices) before water runs through it and after the water runs through it on Slide #1 of the *Observation Sheet*. You may want to take some pictures to help students recall the results or make comparisons in a later lesson.
  - Students run water down the river bed using the bottle or dropper.
  - Students record their observations on Slide #1 of the *Observation Sheet* and, on the class data table on Slide #2, fill in the No Dam table with their groups measurements.
  - As a class, discuss how the water changed the shape of the land and use evidence (measurements) to support ideas.

Explain Activity #1:
- Read the *Rivers* by Rebecca Pettiford on epic! Books
- Compare the features from the book to those created in the Explore Activity.
  - Reinforce how water widens the river bed, carries sediment away and changes the overall appearance of the land.

Resources for Explore/Explain #1:
- Observation sheet
- Rivers by Rebecca Pettiford on epic! Books

Explore Activity #2:
- Ask students what can be used to reduce or prevent water's erosional impacts on the land. (Be sure to prompt them to include a dam.)
- Ask students to share their predictions about how a dam would affect erosion caused by the river.

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    - Make sure that students provide reasoning for their predictions.
- Drain and smooth the sand in the tubs and have the students repeat the initial exploration investigation except this time provide students with a variety of dam making materials such as craft sticks, pebbles, twigs, legos, rocks, moss, etc. (You may want to take some pictures to help students recall the results or make comparisons.)
    - Students once again trace a river bed in the sand
    - Students choose a location for their dam and select appropriate materials for their design.
    - Students build a dam.
    - Ask students to measure the width of the river bed above and below the dam and record their data on Slide #3 of the *Observation Sheet.*
    - Students run water through the river bed using the same technique they used in Activity #1.
    - Students measure above and below the dam after the water runs through it, and they record their data on the Slide #3 of the *Observation Sheet* and, on the class data table on Slide #4, fill in the Dam table with their group measurements.

Explain Activity #2:

- Class discusses and uses evidence (measurements) to support ideas.
    - How did the depth and width of the river change when the dam was added?
    - Use the data collected from the Explore phases to compare the effects of erosion downstream in both scenarios (with and without a dam).
- Post photos taken from both explorations.
- Prompt students to share their ideas about what happened:
    - Which stream/river changed the most downstream?
    - What was the reason for the change?
    - What types of events may make the erosion take place faster?
    - How did the addition of a dam change the shape of the river downstream?
    - Was the change as drastic as previous investigations?
    - Why is the level of erosion less downstream?
    - What about changes upstream from the dam?
    - Teacher Information: In nature, beaver dams raise the water table alongside a stream, aiding the growth of trees and plants that stabilize the banks and prevent erosion. They improve fish and wildlife habitat and promote new, rich soil.
- Ask students to think about the images on the *Dam Changes the System Slide*.
    - What did they notice about the amount of water at the top of the dam, compared to below the dam, how do the living things change?
    - How can living things prevent erosion?
    - Record student thinking.

Resources for Explore/Explain#2:

- Observation sheet
- Dam Changes the System Slide

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students
- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

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- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement
- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: erosion, land forms, river, stream, sediment, riverbank

ELABORATE (Applications / Extensions)

Activity Description :

- Students use the *Explanatory Model Organizer* to describe the outcomes related to the construction of a dam.
    - Have them consider previous lessons as they develop these models.
    - You can prompt student thinking by posting a "gotta have it" list (for example the damn, change in the river, change in vegetation, change in animal life) for the models. See the teacher resource component to gauge student prompts.
    - Make sure students embed the concept of time in their models. They will need to define the length of time in which these changes occur as a part of their explanatory model.
    - Teacher notes:
        - You may want to do this as a whole class activity to prompt student thinking.
        - Students will be making another map model of a beaver impacted area in the next learning sequence. Do not spend too much time on this Elaborate model because it is a stepping stone/draft for the next learning sequence.

Resources:

- Explanatory Model Organizer

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

Elaborate Further / Reflect / Enrichment:

Safety Note: Students MUST wear goggles while working with sand and stream tables.

Activity Description:

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- As a class discuss what other elements can change the shape of the land - be sure to include wind.
- What effect does wind have on sand? (Demonstration or class exploration)
    - Spread a cup of sand in a plastic tub or shoebox.
    - With a rolled up piece of paper (to mimic a straw) blow 5 puffs of air to represent the wind.
    - Discuss with the class the movement of the sand and how the surface changed.
- Read pages 4-11 in *How Do Wind and Water Change Earth* by Natalie Hyde on epic! Books
- Ask students to compare water erosion to wind erosion and the methods used to prevent both.

Resources:

- How Do Wind and Water Change Earth by Natalie Hyde on epic! Books (pages 4-11)
- Optional Reading: Wind and Water At Work: A Book About Change by Thomas Sheehan on epic! Books (pages 14-18)
- Teacher Demonstration Information: Wind Erosion Experiment

EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** Constructing Explanations and Designing Solutions; *Developing and Using Models; Analyzing and Interpreting Data*
- ❏ **DCI:** *ESS1.C: The History of Planet Earth; ESS2.A: Earth Materials and Systems; ETS1.C: Optimizing the Design Solution*
- ❏ **CCC:** *Stability and Change*

Summative Assessment Description(s)

- Student models constructed in Elaborate.

Additional Resources:

- G2 Unit Materials List
    - Click on specific tab for unit-specific materials

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Learning Sequence 5

Brief Description:
In this learning sequence, students will be figuring out other ways that landforms are created besides erosion along river beds.

Suggested Pacing:
1.5 - 2 hrs for 5Es
0.75 - 1.25 hrs for Culminating Performance Task

Lesson-Level Phenomenon/Design Problem:
Landform sorting activity

Relationship to Anchoring Phenomena/Design Problem:
Students will generate a map of Beaver Falls (a fictional location) and identify landforms and features relative to the region of a beaver dam. Students will map their ideas using mapping symbols and tools learned in the sequence.

Learning Sequence Driving Question:
What are the other ways that landforms can be created, besides erosion along river beds?

Student Expected Outcome:
- Students will develop and use models to represent the patterns of land and water in an area.

CONNECTIONS TO STANDARDS

Three Dimensions Related to the Specific Learning Performance(s):

Science & Engineering Practices:	Disciplinary Core Ideas:	Crosscutting Concepts:
Developing and Using Models • Develop a model to represent patterns in the natural world. (2-ESS2-2)	**ESS1.C: The History of Planet Earth** • Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. **ESS2.A: Earth Materials and Systems** • Wind and water can change the shape of the land. **ESS2.B: Plate Tectonics and Large-Scale System Interactions** • Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2-2)	**Patterns** • Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3)

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Related Performance Expectation(s) in this Unit:

- 2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
  - [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.]
  - [Assessment Boundary: Assessment does not include quantitative measurements of timescales.]
- 2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.
  - [Assessment Boundary: Assessment does not include quantitative scaling in models.]

Possible Common Core State Standards Connections:

ELA/Literacy —

- RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (2-ESS1-1)
- RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. (2-ESS1-1)(2-ESS2-1)
- RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. (2-ESS2-1)
- W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (2-ESS1-1)(K-2-ETS1-3)
- W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-ESS1-1)
- W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-ESS1-1)(K-2-ETS1-3)
- SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media. (2-ESS1-1)
- SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (2-ESS2-2)

Mathematics —

- MP.2 Reason abstractly and quantitatively. (2-ESS1-1) (2-ESS2-2)(K-2-ETS1-3)
- MP.4 Model with mathematics. (2-ESS1-1)(2-ESS2-2)(K-2-ETS1-3)
- MP.5 Use appropriate tools strategically. (2-ESS2-1)(K-2-ETS1-3)
- 2.NBT.A Understand place value. (2-ESS1-1)
- 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. (2-ESS2-2)
- 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. (2-ESS2-1)

Prior Student Knowledge:

K.ETS1.A

Possible Preconceptions/Misconceptions:

Any landform can be found anywhere.
Landforms always stay the same.

LESSON PLAN – 5-E Model

ENGAGE (Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions)

Activity Description:

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- Class views and discusses the Slide #1 of the *Pirate Map Slideshow.*

Resources:

- Pirate Map Slideshow

Teacher Action(s):

- Creates interest
- Generates curiosity
- Raises questions
- Elicits responses that uncover what the students know or think about the concept

Student Action(s):

- Asks questions such as, "Why did this happen?" "What do I already know about this?" "What can I find out about this?"
- Shows interest in the topic

EXPLORE (Lesson Description / Materials Needed / Probing or Clarifying Questions)

Activity Description:

- Ask students to work in small cooperative groups to match the landform pictures with the correct descriptions from the *Bodies of Water and Landforms Handout*. DO NOT paste or tape them down. As the students work elicit their ideas as to which landforms were created as a result of moving water, much like the erosion of a river bead or system. Record their ideas.

Resources:

- Bodies of Water and Landforms Handout

Teacher Action(s):

- Encourages the students to work together without direct instruction from the teacher
- Observes and listens to the students as they interact
- Asks probing questions to redirect the students' investigations when necessary
- Provides time for the students to puzzle through problems
- Acts as a consultant for students

Student Action(s):

- Thinks freely, within the limits of the activity
- Test predictions and hypotheses
- Forms new predictions and hypotheses
- Tries alternatives and discusses them with others
- Records observations and ideas
- Suspends judgement

EXPLAIN (Concepts Explained / Vocabulary Defined)

- Have the students keep their *Bodies of Water and Landforms Handout* in front of them.
    - Read L*ooking at Landforms* by Ellen Mitten on epic! Books. As you read, collect student ideas relative to each of the landforms.
    - Discuss the landforms and bodies of water not mentioned in the book.
    - Allow students to revise their landform description cards and glue when consensus about placement is decided.
- Using Slide #1 of the *Pirate Map Slideshow,* discuss where on those maps the various Explore landforms could be found.

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- Maps often include keys to help readers identify water and landforms. Ask students to work with their peers to create a key for Slide #2 of the *Pirate Map Slideshow*.

Resources:

- Bodies of Water and Landforms Handout
- Looking at Landforms by Ellen Mitten on epic! Books
- Pirate Map Slideshow

Teacher Action(s):

- Encourages the students to explain concepts and definitions in their own words
- Asks for justification (evidence) and clarification from students
- Formally provides definitions, explanations, and new labels
- Uses students' previous experiences as the basis for explaining concepts

Student Action(s):

- Explains possible solutions or answers to others
- Listens critically to others' explanations
- Questions others' explanations
- Listens to and tries to comprehend explanations the teacher offers
- Refers to previous activities
- Uses recorded observations in explanations

Vocabulary: landform, map, key

ELABORATE (Applications / Extensions)

Activity Description:

- Read *Earth's Changing Surface* by Conrad J. Storad on epic! Books.
- As a class, discuss how each of the Earth events/landforms in the book would be either a slow change or a quick change using the Slide #1 of the *Elaborate Slideshow*.
- As a class discuss where beaver dams would fit into this classification.
- As a class, discuss where dams made by humans would fit into this classification.
    - Teacher Note: There can be a case made for either slow or quick change for the beaver and human dams. There is no wrong answer.

Resources:

- Earth's Changing Surface by Conrad J. Storad on epic! Books
- Elaborate Slideshow

Teacher Action(s):

- Expects the students to use formal labels, definitions, and explanations provided previously
- Encourages the students to apply or extend the concepts and skills in new situations
- Reminds the students of alternate explanations
- Refers the students to existing data and evidence and asks "What do you already know?", Why do you think…?

Student Action(s):

- Applies new labels, definitions, explanations, and skills in new but similar situations
- Uses previous information to ask questions, propose solutions, make decisions, and design experiments
- Draw reasonable conclusions from evidence
- Records observations and explanations
- Checks for understanding among peers

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EVALUATE

Formative Monitoring Description(s) (Questioning / Discussion)

Formative monitoring will occur at various times throughout this learning sequence. Please note the following SEP, DCI and CCC needs to be monitored throughout the learning sequence.

- ❏ **SEP:** *Developing and Using Models*
- ❏ **DCI:** *ESS1.C: The History of Planet Earth; ESS2.A: Earth Materials and Systems; ESS2.B: Plate Tectonics and Large-Scale System Interactions*
- ❏ **CCC:** *Patterns*

Culminating Performance Task:

- Students will make a map of a fictional location called Beaver Falls. Let students know that their map must include the following:
  - beaver dam
  - variety of landforms and types of water bodies (relevant to the area - as beavers created wetlands, a desert is probably not applicable and should not be included). Each landform should have an explanatory feature:
    - The _____ is near the _____ because_____
    - The beaver dam changed the landscape by _____.
  - a key
- Students Gallery Walk with Post-its to add comments to each of their peer's maps. Revise maps as needed based on peer feedback.

Resources:

- Gotta Have It Checklist

Additional Resources:

- G2 Unit Materials List
  - Click on specific tab for unit-specific materials

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BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ Board Meeting Date April 28, 2022

Decision Requested X Agenda Code 12 a.

AGENDA REPORTING FORM

Agenda Topic: Southington Public Schools Last Day of School 2022

Summary of Issue: Southington High School graduation date has been set for Friday, June 17, 2022. If all schools were to be in session for 181 days, the current last day of school would be Monday, June 20, 2022. If Friday, June 17, 2022 was declared the last day of school for all schools in the district, we would be in compliance with the state required 180 days in session.

Background: Southington Public Schools was closed four days due to weather: January 7, 2022, January 20, 2022, February 4, 2022, February 25, 2022 making Monday, June 20, 2022 day 181.

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: To approve Friday, June 17, 2022 as the last day of school for all Southington Public Schools.

Steven Madaras

Signature of Superintendent of Schools

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ Board Meeting Date April 28, 2022

Decision Requested X Agenda Code 12 b.

AGENDA REPORTING FORM

Agenda Topic: Adoption of 2023 Board of Education Meeting Dates

Summary of Issue: The Board of Education annually adopts their regular meeting schedule for the ensuing year at this time.

Background: Board of Education Policy #9321 indicates that meetings are held on the second and/or fourth Thursday of each month at a time to be determined and at the established Board meeting place (see attached Board Policy #9321).

Alternative Strategies: Modify the Schedule

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

Beginning Date of Program or Project: January 2023

Ending Date of Program or Project: December 2023

Recommendation or Comment: Recommend that the proposed schedule of regular Board of Education meeting dates for 2023 be approved.

Title of Attachments:

1. 2023 Regular Board Meeting Dates
2. Board of Education Policy #9321

Steven Madaras

Signature of Superintendent of Schools

Southington Public Schools
BOARD OF EDUCATION
2023 REGULAR MEETING DATES
7:00 p.m.
John Weichsel Municipal Center
200 North Main Street
Southington, CT

January 12, 2023~ Operations
January 17, 2023 (Budget Workshop)
January 19, 2023 (Budget Workshop)
January 26, 2023 ~ Instruction

February 23, 2023~ Operations

March 23, 2023 ~ Operations

April 27, 2023~ Operations

May 11, 2023~ Operations
May 25, 2023~ Instruction

June 8, 2023~ Operations
June 22, 2023~ Instruction

August 10, 2023~ Operations

September 14, 2023~ Operations
September 28, 2023~ Instruction

October 12, 2023~ Operations
October 26, 2023~ Instruction

November 9, 2023~ Operations

December 14, 2023~ Operations

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only _____ **Board Meeting Date** April 28, 2022

Decision Requested X **Agenda Code** 12 c.

AGENDA REPORTING FORM

Agenda Topic: Out of State: Approval of Out of State/Overnight Field Trip

Summary of Issue: The Board of Education must give approval for field trips that are over 200 miles in distance from Southington, trips to foreign countries, or overnight field trips. Presented here is the following trip:

- JAD- 8th Grade – Ellis Island & Statue of Liberty - New York, NY
  May 20, 2022

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 field trip request as presented by the administration.

Titles of Attachments:
1. Field Trip Application

Frank Ryan
Signature of Staff Member Submitting Report

Peter Madarasz
Signature of Superintendent of Schools

DePaolo Middle School
Orange Team – 8th Grade

Ellis Island & Statue of Liberty – New York, NY

May 20, 2022

R-6153

Southington Public Schools
Southington, Connecticut

Application for Out-of-State/In-State/Overnight Field Trip

Submit to Assistant Superintendent

Date: 3/29/22
Out of State: Yes ☒ No ☐
Overnight: Yes ☐ No ☒
Miles Round Trip: 225

DePaolo (School) | Grade 8 - Orange Team (Class/Group) | Friday, May 20, 2022 (Date of Trip)

Name and Address of Destination Ellis Island + Statue of Liberty, New York
Reasons for Field Trip Interdisciplinary Unit (see attached itinerary)
Itinerary (attach if needed) Attached
Departure Date/Time 5/20/22 - 6:30 AM **Return Date/Time** 5/20/22 - 7:00 PM
# of Students 107 **# of Teacher/Chaperones** 15 **# of Buses** 3
Have definite arrangements been made at the field trip destination? ☒ Yes ☐ No

☑ **Have met with nurse to address student health needs.**
Nurse's Signature Lori Winkler **Date** 3/29/22

☐ **Have NOT met with the nurse. Will meet with the nurse to address student health needs when the student roster is complete. This meeting will take place approximately one-month prior to the scheduled trip.**

Destination is handicap accessible: Yes ☒ No ☐ **Lift Van Needed?** Yes ☐ No ☒

****

COST AND FINANCING

Source of Funds	Totals	Additional Notes
TOTAL Anticipated Cost of Trip	$ 6,955.00	
Board of Education Contribution	$	
Other	$	
Fundraising Activity	($)	
BALANCE	$ 0.00	
Student Contribution		
Transportation	$ 50.00	107 Students @ $ 5350
Entrance Fees, Room & Board	$ 15.00	107 Students @ $ 1605
TOTAL Cost of Trip to Each Student	$ 65.00	

SIGNATURES

Teacher Erika P. Moreau **Date** 3/29/22
Dept. Head **Date**
Principal C. Talbot **Date** 3/29/22
Comments

Assistant Superintendent Frank Ruggiero **Date** 3/30/22 **Approved** ☒ Pending COVID Restrictions **Not Approved** ☐

Board of Education Approval* ** YES☐ NO☐ **Date**

Field Trip to Ellis Island & Statue of Liberty - Friday, May 20, 2022

Tentative Itinerary:

6:15 AM	Students arrive at DePaolo Middle School & board buses
6:30 AM	Depart DePaolo
9:30 AM	Arrive at Liberty State Park, New Jersey
10:00 AM	Board ferry for Ellis Island
10:15 - 1:00	Tour Ellis Island Immigration Museum
	(Lunch at Ellis Island)
1:15 PM	Board ferry for Liberty Island
1:30-3:00	Tour Statue of Liberty - Pedestal & Museum
3:15 PM	Board ferry to Liberty State Park
4:00 PM	Depart Liberty State Park, New Jersey
7:00 PM	Arrive back at DePaolo Middle School

Curriculum Connections to Academic Subjects:

Language Arts: A field trip to the Statue of Liberty and Ellis Island enriches many aspects of the interpretation unit in Language Arts. In Language Arts we discussed the importance of point of view and perspective for the reader and characters in a story; we explored how our own perspectives may be affected by life experiences, nationalities, races, ages, genders, etc.; thus, when at Ellis Island, students will be pushed beyond their own way of viewing the world to see from other perspectives and points of view. Additionally, students identified literary elements within and the text structures of "The Declaration of Independence," "The Gettysburg Address," and "I Have a Dream." The field trip will provide students with a broader outlook on what it means to be American and how these literary works represent bigger tropes in American history.

U.S. History: Before touring Ellis Island, students will study immigration through the lens of citizenship. Being an active citizen in our country is an important part of our class discussions, especially in an election year. Students will take the citizenship test that present-day immigrants must pass in order to become a citizen. In class, students studied the freedoms and liberties that were granted to us in the Constitution; they will connect this learning to their visit of the Statue of Liberty and the symbolism she represents.

Math: The math connections we will be looking at will have to do with the size of the Statue of Liberty. We will compare the height of the statue with the height of our school and look at differences and ratios between the two. Students will also compare their own height with that of the statues. By doing this, students will get practice in writing and solving proportions. Mathematics can also help support the science connections by using multi-step equations to set up and solve problems dealing with distance, rate, and speed.

Science: The science connections begin when we get on the bus and don't end until students go to bed that night. During our trip we will be experiencing core curriculum concepts such as: motion, reference points, average speed, instantaneous speed, constant speed, velocity, acceleration, as well as the forces that make all this motion happen. The boat ride will allow calculations of speed when the river is running opposite to the direction of travel. On a boat, we can experience this velocity change in ways that are difficult to reproduce on land.

World Language: Students will gain a deeper cultural insight into the lives of the over 12 million immigrants who helped shape the culture and history of the United States as they arrived in America. They will be able to retrace the steps of people pursuing new lives in a new land, something that we talk about in the classroom but will now get to experience through the immigration museum exhibits. Students will also make personal connections by searching for and/or examining their own ancestors' names on the memorial wall.

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** April 28, 2022

Decision Requested _____ **Agenda Code** 12 d.

AGENDA REPORTING FORM

Agenda Topic: Policy 4118.4 – Staff Ethics – Policy Revision - First Reading

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 4118.4 – Staff 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 4118.4 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 4118.4

Signature of Staff Member Submitting Report

Signature of Superintendent of Schools

Policy 4118.4
Staff Ethics – Policy Revision
Draft

Series 4000: Personnel

Personnel – Certified/Classified

Staff Ethics

An effective educational program requires the service of men and women of integrity, high ideals and human understanding. To maintain and promote these essentials, the Board of Education expects all employees of the Southington Public Schools to maintain high standards of personal and professional behavior. Among those standards which the Board expects its staff members to maintain are the following:

1. Make the well-being of students the fundamental value of all decision-making and actions;
2. Fulfill professional responsibilities with honesty and integrity;
3. Support the principle of due process and protect the civil and human rights of all individuals;
4. Honor all contracts until fulfillment, release, or dissolution mutually agreed upon by all parties to the contract;
5. Exhibit candor with supervisors and report to a supervisor any arrest or conviction of the employee that could erode the public's trust in the employee's ability to fulfill his/her professional duties;
6. ~~To m~~Maintain fair and courteous relationships with students, parents, staff members and others;
7. ~~To t~~Transact all official business with the properly designated authorities of the school district;
8. ~~To r~~Represent the school district in such a manner that the contributions of the school district are recognized;
9. ~~To p~~Place the welfare of children as the first concern of the school district;
10. ~~To r~~Restrain from using school contacts and privileges to promote partisan politics and sectarian religious views;
11. ~~To d~~Direct any criticism of other staff members or of any department of the school district only towards the improvement of the school district. Constructive criticism is to be made first directly to the particular school administrator who has the responsibility for evaluating the situation and then to the Superintendent of Schools;
12. ~~To k~~Keep confidential such information as may be secured in confidence unless disclosure serves professional purposes or is required by law;
13. ~~To p~~Properly use and protect all school properties, equipment, and materials;
14. ~~To a~~Avoid conduct which will result in discredit or a lack of confidence in themselves, their colleagues, or the school district.

Teachers must adhere to the Connecticut Code of Professional Responsibility for Teachers (Regulations of Connecticut State Agencies Section 10-145d-400a), which Code is incorporated herein by reference.

Administrators must adhere to the Connecticut Code of Professional Responsibility for School Administrators (Regulations of Connecticut State Agencies Section 10-145d-400b), which Code is incorporated herein by reference.

Violations of this policy may result in disciplinary action, up to and including termination of employment.

Policy adopted: December 1988
Policy reviewed: April 2003
Policy reviewed: April 2022

Legal References:

Regulations of Connecticut State Agencies, § 10-145d-400a Code of Professional Responsibility for Teachers; Connecticut Code of Professional

Regulations of Connecticut State Agencies, § 10-145d-400b, Code of Professional Responsibility for School Administrators

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** April 28, 2022

Decision Requested _____ **Agenda Code** 12 e.

AGENDA REPORTING FORM

Agenda Topic: Policy 5145.2 – Freedom of Speech/Expression – Policy Revision - First Reading

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 5145.2 – Freedom of Speech/Expression.

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 5145.2 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 5145.2

Frank Ryan

Signature of Staff Member Submitting Report

Peter Madaras

Signature of Superintendent of Schools

Policy 5145.2

Freedom of Speech/Expression – Policy Revision

Draft

Series 5000: Students

Welfare

Civil and Legal Rights and Responsibilities

Freedom of Speech/Expression

It shall be the policy of the Southington Board of Education to recognize and protect the rights of student expression. This right shall be protected to the extent that it does not substantially interfere with the school board's mission in providing an orderly and efficient educational process and school environment. ~~Printed~~ material distributed on school district property shall meet the following criteria:

1. Material shall be non-commercial.
2. Material shall not be obscene.
3. Material shall not advocate unlawful action.
4. Material shall not be libelous or contain false statements or innuendo that would subject any person to hatred, ridicule, contempt, or injury to reputation.
5. Material shall not create an immediate threat to or create a substantial disruption of the educational process.

~~Printed~~ material may not be sold on school property nor may material be distributed which seeks a donation or solicits funds.

Students who are responsible for a substantial distribution of ~~printed~~ material in contravention of this policy may be subject to discipline in accordance with board policy no. 5114.

In the event that a student or students question whether ~~printed~~ material to be distributed will violate this policy, such student or students may consult with the building administration to determine whether distribution of ~~printed~~ material would contravene this policy. Such consultation with the building administration shall be at the option of the student or students who seek to distribute the material.

(cf. 1220 – Citizens' Advisory Committees)
(cf. 1312 – Public Complaints)
(cf. 6144 – Controversial Issues)
(cf. 6161 – Equipment, Books, Materials: Provision/Selection)

Policy Adopted: November 1989 Policy Revised April 2022

BOARD OF EDUCATION
SOUTHINGTON, CONNECTICUT

Informational Only X **Board Meeting Date** April 28, 2022

Decision Requested _____ **Agenda Code** 12 f.

AGENDA REPORTING FORM

Agenda Topic: Policy 6162 – Care of Instructional Materials – Policy Revision - First Reading

Summary of Issue: The Policy & Personnel Committee has reviewed Policy 6162 – Care of Instructional Materials.

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 6162 to the full Board for a First Reading.

Titles of Attachments:

1. DRAFT Policy 6162

Frank Ryan

Signature of Staff Member Submitting Report

Peter Madaras

Signature of Superintendent of Schools

Policy 6162

Care of Instructional Materials – Policy Revision

Draft

Series 6000: Instruction

Instructional Services

Care of Instructional Materials

Damaged or Lost Instructional Materials

The Board of Education may impose sanctions against students who lose or damage textbooks, devices, and other educational materials. The Superintendent is authorized by the Board to set regulations and adopt any guidelines necessary to carry out the wishes of the Board.

Legal Reference: Connecticut General Statutes

10-221 (c): Boards of Education to prescribe rules

Policy adopted: May 1989
Policy revised: April 2022