

# Board of Education Meeting

Wednesday, May 7, 2025 7:00 PM

BOE Auditorium and via Zoom Meeting Platform, 129 Church Street, Bristol, CT 06010

1. **CALL TO ORDER AND PLEDGE OF ALLEGIANCE**

2. **STAFF AND STUDENT RECOGNITION**

2.1. Staff Achievement Awards

2.2. CABE Student Leadership Awards

2.3. South Side School Program - 'All Kids Bike'

2.4. Bristol Lions Club - Ambassador Sight Award

3. **APPROVAL OF MINUTES**

4. **COMMITTEE REPORTS**

5. **STUDENT REPRESENTATIVE REPORTS**

6. **CHAIR REPORT**

7. **PUBLIC COMMENT**

8. **DELIBERATED ITEMS/DISTRICT LEADERSHIP TEAM REPORTS**

8.1. Appointment of the Superintendent of Schools

8.2. Appointment of the Deputy Superintendent of Schools

8.3. Scoreboard Donation

8.4. Contract 2P25-060 Professional Services for Redistricting of Bristol Public Schools

8.5. April 1 Enrollment Count for the 2024-2025 School Year

8.6. Pupil Personnel Services Report

8.7. Voluntary Separation Incentive Payout (VSIP)

9. **SUPERINTENDENT REPORT**

10. **CONSENT AGENDA**

10.1. PERSONNEL

10.1.a. Teacher Retirement - Effective June 30, 2025

10.1.b. New Teacher Hires

10.1.c. TEAM Mentor/Cooperating Teacher Approval

**11. CURRICULUM REVISION**

11.1. Kindergarten Literacy Curriculum Revision

11.2. Kindergarten Music Curriculum Revision

11.3. ECE Chemistry Curriculum Revision

11.4. Career Work Experience (CWE)  
50/100 Curriculum Revision

11.5. PLTW Principles of Engineering Curriculum  
Revision

11.6. PLTW Intro to Engineering and  
Design Curriculum Revision

11.7. Tools and Materials Curriculum Revision

**12. POLICY REVISION**

12.1. CAFE Policy 5145.44(a), 4000.1, 4200.0 -  
Students/Personnel - Certified/Non Certified,  
Sexual Harassment/Title IX Prohibition of Sex  
Discrimination and Sexual Harassment in the  
Workplace

12.2. CAFE Policy 6171.2(a) - Special  
Education, Preschool Special Education

**13. NEW BUSINESS**

**14. INFORMATION/LIAISON REPORTS**

**15. ADJOURNMENT**

*The minutes presented within this document are a summary of the discussion that took place at the Board of Education meeting. To view the meeting in its entirety and hear full reports please click the following link: [April 2, 2025 - Regular Meeting Recording](#).*

**BRISTOL BOARD OF EDUCATION**  
**Bristol, Connecticut**  
**Wednesday, April 2, 2025 – 7:00 p.m.**  
**Regular Meeting Minutes**

The Bristol Board of Education regular meeting was held on Wednesday, April 2, 2025, at 7:00 p.m. in the Bristol Board of Education Auditorium located at 129 Church Street and via the Zoom Meeting Platform.

**PRESENT:** Commissioners: Russell Anderson, Eric Carlson, Jill Fitzsimons-Bula, Kristen Giantonio, Lorianne Osenkowski, Maria Simmons, Dante Tagariello, Jennifer Van Gorder and Chair Shelby Pons (virtual)

**ALSO PRESENT:** Iris White, Acting Superintendent, Mary Hawk, Acting Deputy Superintendent and Erick Rosengren, Council Liaison

Chair Pons called the meeting to order at 7:01 p.m. and asked the audience to stand for the Pledge of Allegiance.

Chair Pons asked the audience to join her in a moment of silence for Bernard O'Keefe a History Teacher and Cross-Country Coach at Memorial Boulevard Middle School and Bristol Central High School from 1960 to 1986; Marie Rivard a Grade 3 and 4 Teacher at O'Connell School from 1969 to 2001; Stan Sepiol a Head Automotive Teacher at Bristol Central High School from 1966 to 2004.

**STAFF AND STUDENT RECOGNITION**

The Board recognized the following staff and students

**BAIMS Royal Bees Drone Team** – Lea McCabe introduced the BAIMS Royal Bees Drone Team. Team Advisor Crystal Caouette and team members Natalie Wozniak - Gr. 8, Zoe Bianco - Gr. 7, Emma Gaity - Gr. 6 and Blake Monsom - Gr. 6 were present and spoke briefly about the roles they each have on the team and what happens at competition. The team competed March 20<sup>th</sup> where they scored the highest of any middle school and some high schools. By earning this award, they qualified for Northeast Regionals, at the end of May, at Fairmont State University in West Virginia. The Board to pose for picture with the Royal Bees.

**National Paraeducator Appreciation Day - April 2nd**

Superintendent White spoke about National Paraeducator Appreciation Day. National Paraeducator Appreciation Day is celebrated annually on the 1st Wednesday in April. We want all Bristol Public Schools paraprofessionals to know that we recognize their contributions and thank them for their hard work on behalf of our students and families.

**APPROVAL OF MINUTES**

**March 5, 2025 – Regular Meeting Minutes**

Chair Pons called for a motion to approve the March 5, 2025 Regular Minutes as written.

Commissioner Tagariello abstained.

Motion made by Russell Anderson and seconded by Lori Osenkowski. Passed Unanimously.

**March 12, 2025 - Special Meeting Minutes**

Chair Pons called for a motion to approve the March 12, 2025 - Special Meeting Minutes as written.

Motion made by Dante Tagariello and seconded by Russell Anderson. Passed Unanimously.

## **COMMITTEE REPORTS**

### **Policy Committee**

Commissioner Fitzsimmons-Bula reported that the committee met on March 26th and had an extensive discussion about Policy 5145.123(a) – Search and Seizure - Use of Metal Detectors and Policy 5145.12 – Student Search and Seizure. The committee sought feedback from the full board, board attorneys, and administrators. The policies will be discussed and voted upon this evening. The next policy meeting is on April 23rd, and the Student Achievement Committee will be meeting April 30th.

### **School, Family and Community Partnerships**

Commissioner Simmons reported that the committee activated well-being as they do at every meeting. The committee had Dr. Broderick report on the School, Family, and Community Partnerships Goal and Action Plan. He provided updates on the great work that the school community is doing to further the work of school, family, and community partnerships. Dr. Josh Medeiros from Bristol, Parks, Recreation and Youth and Community Services joined the meeting and spoke about the wonderful things that they're doing in the community, but also the ways that they continue to partner with the school and support the needs of the school community, both inside the schools and outside the schools during the regular school year and throughout the summer. The committee discussed the roles of liaisons as board commissioners and how they may reshape this role. They also talked about staff and student recognition and ways that we might be able to empower our school community school leaders to give us information about staff recognition, certified and non-certified, and student recognition so that maybe we can even celebrate them formally at our board meetings.

## **STUDENT REPRESENTATIVE REPORTS**

### **Bristol Central**

Bristol Central Junior Representative Amelia Brown, was unable to present this evening as she is preparing for the upcoming BCHS Footlights production of *Mama Mia!*

### **Bristol Eastern**

Bristol Eastern Junior Representative Paige Ansah presented the Bristol Eastern monthly Student Representative report. Highlights from her report included a sports update, upcoming and past events as well as accomplishments of students. Spring sports have kicked off and are in full spring. BE's National Honor Society will induct new members on April 7th. Quarter 3 is coming to an end, and the final quarter of the school year will begin shortly. With Quarter 4 beginning, students will begin to prepare for finals in June and AP testing. Recently, Juniors had the opportunity to take SAT's. Many teachers offered a variety of SAT prep resources throughout the school year to make sure students were properly prepared. Juniors will also have to take the NGSS testing next month on May 19th. Prom preparations are at an all-time high, Junior prom is being held on May 10th at Hawks Landing, in Southington, and Senior prom is being held on May 24th at the Aqua Turf. Prom has also been working tirelessly to gather prom dresses and suits for students who may not be able to afford them, so that they may experience prom the same as their peers. BE Culture Day is coming up on Friday, April 11th, Students will have the opportunity to view a variety of different cultures and learn about them from peers and teachers as well. There will be games, music, dancing, and a parade in the morning to start the day. BETA has put a lot of time and effort into the spring musical *Rock of Ages*. The musical will premiere May 2<sup>nd</sup> and 3<sup>rd</sup> at 7:00 p.m. and May 4<sup>th</sup> at 2 p.m. Finally, the Student Council has formed a committee called Earth Day Committee to help plan activities and events to help students and teachers learn more about bettering our planet as well as actively partake in the cleaning and betterment of our environment. Earth Day is on Tuesday, April 22nd.

Commissioner Tagariello called for a motion to move Item 6. Chair Report and Item 7. Superintendent Report to follow Item 9. Public Comment. The motion was seconded by Commissioner Carlson.

Discussion followed regarding why the items were being moved.

The motion passed unanimously.

## **CONSENT AGENDA**

Chair Pons called for a motion to approve the Consent Agenda, which includes Items 8.1.a – 8.2.a.

**Motion made by Dante Tagariello and seconded by Russell Anderson. Passed Unanimously.**

### **8.1. PERSONNEL**

#### **8.1.a. Teacher Retirement - Effective June 30, 2025**

Desjardins, Kerry - MTV - Grade 1 Teacher

The Board of Education voted to accept the Teacher Retirement as presented.

**Motion made by Dante Tagariello and seconded by Russell Anderson. Passed Unanimously.**

#### **8.1.b. Teacher Resignation - Effective June 18, 2025**

Conklin, Madison - WB - Special Education Teacher

The Board of Education voted to accept the Teacher Resignation as presented.

**Motion made by Dante Tagariello and seconded by Russell Anderson. Passed Unanimously.**

#### **8.1.c. New Teacher Hires**

Kenney, Kailyn - MTV - Grade 4 Teacher - Effective April 7, 2025

Saverino, Alexandria - EDGE PK - PreK Special Education Teacher - Effective February 6, 2025

The Board of Education voted to approve the New Teacher Hires as presented.

**Motion made by Dante Tagariello and seconded by Russell Anderson. Passed Unanimously.**

### **8.2. GRANTS**

#### **8.2.a. PEGPETIA Grant**

The Board of Education voted to authorize the Business Services Department to accept the PEGPETIA Grant for FY 2025-2026.

**Motion made by Dante Tagariello and seconded by Russell Anderson. Passed Unanimously.**

## **9. PUBLIC COMMENT**

Public Comment was submitted for this evening's meeting. Copies were placed at the Commissioners' seats. Chair Pons read the public comment rules. There was a discussion regarding #3 and #11.

### **Submitted Public Comment**

1. Emily Bailey – 21 Tiffany Lane – Addressed the Board regarding closing Edgewood PreK Academy.
2. Members of the Bristol Physical Education Dept. – Addressed the Board regarding proposed changes to Physical Education

### **In-Person Public Comment**

1. Scott Gaudet – 718 Pine Street (BAPS) – Addressed the Board regarding the BAPS Budget.
2. Mayor Jeff Caggiano – 100 N. Main Street – Addressed the Board regarding BOF Budget Update
3. Ellen Zoppo-Sassu – 47 Kory Lane – Addressed the Board regarding the Budget
4. Jennifer Benvenuto – 239 Grove Street - Addressed the Board Regarding the BoE Budget.
5. Mike Reynolds – 551 Peacedale Street – Addressed the Board regarding the AFT Budget.

## **CHAIR REPORT**

Chair Pons presented the monthly Chair Report. Click the following link to read the full report. [Monthly Chair Report](#)

## **SUPERINTENDENT REPORT**

In lieu of a formal budget update. Superintendent White felt it appropriate to share some remarks as a Superintendent. Ms. White discussed the budget process to date; the financial audit; budget cuts that need to be made; the willingness to work with the City; notification of teachers that their contracts would not be renewed, due to a reduction in force; the importance of all of our teachers and coaches; and various ways central office is looking for cost cutting measures. Ms. White thanked everyone for attending the meeting and being engaged in the process.

Discussion followed regarding the Budget. Each commissioner was given the opportunity to speak.

## **DELIBERATED ITEMS/DISTRICT LEADERSHIP TEAM REPORTS**

### **10.1. Discussion and possible action concerning the Superintendent's recommendation to non-renew non-tenured teachers for budgetary reasons**

Superintendent White presented the Superintendent's recommendation to non-renew non-tenured teachers for budgetary reasons. There are five (5) non-tenured teachers that are being recommended for non-renewal due to a reduction in force. They were notified on Friday that it was because of budgetary reasons, not because of performance. Superintendent White read their names as they are part of the union and part of the motion.

Julia Dolce (Grade 5 - 9/9/2024 seniority)  
Trystan Brunet (Grade 2 - 11/26/2024 seniority)  
Gina Wiese (LMS 6-8 - 8/8/2024 seniority)  
Haley Cassidy (Math Grade 8 - 8/19/2024 seniority)  
Lory Lena Park-Knowles (ELA Grade 8 - 8/20/2024 seniority)

Ms. White thanked Acting Deputy Superintendent Hawk, who personally went to deliver these notices to those teachers and also personally delivered and called coaches who were notified on Friday.

Chair Pons called for a motion that the contract of employment of the names read not be renewed for the following year, due to budgetary reasons, upon its expiration at the end of the 2024-25 school year, and that the Superintendent of Schools is directed to advise such person(s) in writing of this action.

### **Motion was made by Eric Carlson and seconded by Russell Anderson.**

Discussion followed. Point of Order called by Commissioner Tagariello regarding the conversation veering away from the motion on the table. Chair Pons called for a Roll Call Vote.

Chair Pons declared the motion **PASSED**. Following the roll call, with five (5) commissioners IN FAVOR of the motion (Anderson, Carlson, Giantonio, Osenkowski, and Van Gorder) and four (4) commissioners OPPOSED (Fitzsimmons-Bula, Simmons, Tagariello, and Pons).

## **End of the Year Closing Date and High School Graduation Date**

Superintendent White presented the End of the Year Closing Date and High School Graduation Date. Traditionally, the closing day of school and the high school graduation date have been set at the April Board meeting. Based on the summary of closing dates provided and upon completion of 181 school days, the last day of school for the 2024-2025 school year will be Wednesday, June 18, 2025. Promotional exercises at the middle schools take place in the morning of the last day of school, Wednesday, June 18, 2025. High school graduations will be scheduled for the evening of Wednesday, June 18, 2025.

**End of the Year Closing Date and High School Graduation Date – cont'd**

Chair Pons called for a motion to approve the high school graduation date and the last day of the 2024-2025 school year as Wednesday, June 18, 2025, following the completion of the 181 school days. This date may be subject to change in the event additional emergency closing days are required between now and the conclusion of the academic year.

**Motion made by Dante Tagariello and seconded by Eric Carlson. Passed unanimously.**

**Parent Conference and Marking Period Dates for SY 2025-2026 and 2026-2027**

Carly Fortin presented the Parent Conference and Marking Period Dates for SY 2025-2026 and 2026-2027. The School Year Calendars for 2025-2026 and 2026-2027 for Bristol Public Schools were recently approved by the Board of Education. Once the school year calendars are established, school administrators and supervisors meet to set the parent conference and marking period dates for these two school years.

Vice Chair Simmons called for a motion to approve the Parent Conference and Marking Period Dates for SY 2025-2026 and 2026-2027.

**Motion made by Dante Tagariello and seconded by Russell Anderson. Passed unanimously.**

**Vote to Accept South Side School HVAC Project as Complete**

Superintendent White shared that Tara Landon was online if you have additional questions. But she did want to share that the Board of Education has the opportunity to seek reimbursement for this project. As part of the State requirement to apply for reimbursement, the project must be accepted by the full board. The SSS HVAC Project Committee accepted the project as complete in October 2023. The total reimbursement from the State is approximately 2.5 million dollars.

Vice Chair Simmons called for a motion to accept the South Side School HVAC Project as complete.

**Motion made by Dante Tagariello and seconded by Eric Carlson. Passed unanimously.**

**Pupil Personnel Report**

Amy Martino presented the Pupil Personnel Services Report. As of March 1, 2025, 1,825 of the 8,084 enrolled Bristol students are identified as requiring Special Education programming. This enrollment reflects 22.58% of the total BPS student population. As of March 1st, 122 students with disabilities required out-of-district placements at private special education school programs. There were 89 students requiring special education programming services at other public out-of-district schools, including magnet schools. During the month of February 2025, 39% of newly registered students were identified as students with special education programming needs at the time of registration; (2) two of the newly enrolled students received their programming and services at an out-of-district special education school program. During the month of February, there were (36) 211 calls and (8) 911 calls.

A question followed regarding the student percentages

**TEXTBOOK ADOPTION**

**Precalculus (Academic) Textbook Adoption (Second Reading)**

Laura Lanza presented the Precalculus (Academic) Textbook Adoption for a second reading. This text will support the new revision of the Precalculus (Academic) Curriculum. The textbook review committee considered four textbooks. They met with sales representatives and rated each textbook. The Pearson Precalculus 7th Edition by Blitzer rated the highest and will support the goals of the revised curriculum.

Chair Pons called for a motion to approve The Pearson Precalculus 7th Edition By Blitzer as the Precalculus (Academic) Textbook.

**TEXTBOOK ADOPTION – cont'd**

**Motion made by Dante Tagariello and seconded by Maria Simmons. Passed unanimously.**

**POLICY REVISION**

**Policy 5145.12 - Search and Seizure**

Mary Hawk presented Policy 5145.12 Search and Seizure. This policy was reviewed and finalized in the Policy Meeting on March 26, 2025. It was approved to be moved to the full board for approval.

Chair Pons called for a motion to approve Policy 5145.12 Search and Seizure as presented.

**Motion made by Dante Tagariello and seconded by Russell Simmons. Passed unanimously.**

**Policy 5145.123(a) - Search and Seizure Use of Metal Detecting Devices**

Mary Hawk presented Policy 5145.123(a) - Search and Seizure Use of Metal Detecting Devices. This policy was reviewed and finalized in the Policy Meeting on March 26, 2025. It was approved to be moved to the full board for approval.

Chair Pons called for a motion to approve Policy 5145.123(a) - Search and Seizure Use of Metal Detecting Devices as presented.

**Motion made by Dante Tagariello and seconded by Russell Simmons. Passed unanimously.**

**NEW BUSINESS**

A clarifying question was asked regarding an earlier motion, in Item 10.1.

Commissioner Anderson had suggestions regarding the budget workshop. Commissioner Anderson had suggestions and ideas regarding the budget. All invited members of the workshop.

**INFORMATION/LIAISON REPORTS**

Maria Simmons – Provided a liaison report regarding the Bristol Eastern Junior Planning Parent Night and the CT Welcoming Schools Initiative.

Council Liaison Erick Rosengren – Shared information regarding registration for Kindergarten.

**ADJOURNMENT**

There being no other business to come before the Board, the meeting should be adjourned. (9:03 p.m.)

Respectfully Submitted



Susan P. Everett  
Executive Secretary to the Board of Education

*The minutes presented within this document, summarize the discussion of the Special Board of Education meeting. To view the meeting in its entirety and hear full reports, please click the following link: [April 4, 2025 - Special Meeting Recording](#).*

**BRISTOL BOARD OF EDUCATION**  
**Bristol, Connecticut**  
**Friday, April 4, 2025 – 5:00 p.m.**  
**Special Meeting Minutes**

A Special Bristol Board of Education meeting was held on Friday, April 4, 2025, at 5:00 p.m. via the Zoom meeting platform.

**PRESENT:** Commissioners: Russell Anderson, Eric Carlson, Jill Fitzsimons-Bula, Kristen Giantonio, Lorianne Osenkowski, Maria Simmons, Dante Tagariello, Jennifer Van Gorder and Chair Shelby Pons

**1. Call to Order and Pledge of Allegiance**

Chair Pons called the Special Meeting to order at 5:01 p.m. The audience stood for the Pledge of Allegiance.

**2. Vote To Convene into Executive Session for the purpose of:**

Chair Pons called for a motion to Vote to Convene into Executive Session for the purpose of:

1. Discussion concerning members of the Search Committee with respect to confidentiality.

Motion made by Dante Tagariello, seconded by Eric Carlson.

Discussion followed regarding holding a Zoom executive session, where commissioners would be during the session, and who would be present. A request that all commissioners be on camera was also made.

The motion **PASSED** following a Roll Call Vote of five (5) commissioners (Carlson, Fitzsimons-Bula, Simmons, Tagariello, and Pons), **IN FAVOR** of the motion, and four (4) commissioners (Anderson, Giantonio, Osenkowski, and Van Gorder) **OPPOSED**.

**EXECUTIVE SESSION**

**PRESENT:** Commissioners: Russell Anderson, Eric Carlson, Jill Fitzsimons-Bula, Kristen Giantonio, Lorianne Osenkowski, Maria Simmons, Dante Tagariello, Jennifer Van Gorder and Chair Shelby Pons

Executive Session was called to order at 5:10 p.m.

**DISCUSSION:**

Commissioners engaged in a discussion concerning members of the search committee with respect to confidentiality. No action was taken.

**3. Reconvene into Public Session to take any votes on matters discussed in Executive Session.**

On a motion made by Dante Tagariello, seconded by Eric Carlson, the board voted to Reconvene into Public Session to take any votes on matters discussed in Executive Session. (6.39 p.m.).

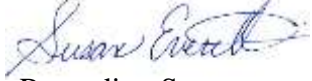
**4. Discussion and Possible Action on the Superintendent Search Committee**

No discussion or action was taken.

**5. Adjournment**

On a motion made by Eric Carlson, seconded by Kristen Giantonio, the board voted to adjourn the meeting. (6:40 p.m.).

Respectfully Submitted,



Recording Secretary  
Bristol Board of Education

DRAFT

The minutes presented within this document, summarize the discussion of the Special Board of Education meeting. To view the meeting in its entirety and hear full reports, please click the following link: [April 28, 2025 - Special Meeting Recording](#).

**BRISTOL BOARD OF EDUCATION**  
**Bristol, Connecticut**  
**Monday, April 28, 2025 – 5:30 p.m.**  
**Special Meeting Minutes**

A Special Bristol Board of Education meeting was held on Friday, April 28, 2025, at 5:30 p.m. via the Zoom meeting platform.

**PRESENT:** Commissioners: Russell Anderson, Eric Carlson, Jill Fitzsimons-Bula (virtual), Kristen Giantonio, Lorianne Osenkowski, Maria Simmons, Dante Tagariello (virtual), Jennifer Van Gorder and Chair Shelby Pons

**ALSO PRESENT:** Lynn Boisvert, Mary Hawk, Acting Deputy Superintendent, Iris White, Acting Superintendent

**1. Call to Order and Pledge of Allegiance**

Chair Pons called the Special Meeting to order at 5:31 p.m. The audience stood for the Pledge of Allegiance.

**2. Presentation on Climate Survey Result Trends by AFT**

Vice Chair Simmons provided a history of how the survey originated, followed by Mike Reynolds, BFT President, presenting the Climate Survey Result Trends. Mr. Reynolds provided an in-depth presentation of the climate survey results.

Following the presentation, each commissioner was given the opportunity to speak or ask questions.

**3. Vote to Convene into Executive Session**

Chair Pons called for a motion to Convene into Executive Session for the purpose of:

- a. Discussion concerning Brian Burke v. Bristol Board of Education (Litigation), Civil Case No.: 3:24-cv-01404-MPS
- b. Discussion concerning the appointment and employment contract for a Deputy Superintendent.
- c. Discussion concerning the appointment and employment contract for a Superintendent of Schools.

Chair Pons informed the audience that the Board will not be appointing the Deputy Superintendent or Superintendent this evening.

Motion made by Eric Carlson, seconded by Russell Anderson. Motion Passed Unanimously.

Commissioner Tagariello asked if anyone would be joining the Executive Session. Attorney James Tallberg and Attorney Tom Mooney would join the Executive Session.

Chair Pons called for an amended motion that would include Attorney Tallberg and Attorney Mooney joining the Executive Session for Part A only.

An amended motion was made by Eric Carlson, seconded by Russell Anderson.

Chair Pons called a Roll Call Vote as two commissioners were attending virtually.

The motion **PASSED** following a Roll Call Vote of nine (9) commissioners (Anderson, Carlson, Fitzsimons-Bula, Giantonio, Osenkowski, Simmons, Tagariello, Van Gorder, and Chair Pons) **IN FAVOR** of the motion. (6:43 p.m.).

## **EXECUTIVE SESSION**

**PRESENT:** Commissioners: Russell Anderson, Eric Carlson, Jill Fitzsimons-Bula (virtual), Kristen Giantonio, Lorianne Osenkowski, Maria Simmons, Dante Tagariello (virtual), Jennifer Van Gorder, and Chair Shelby Pons

**ALSO PRESENT:** Attorney James Tallberg and Attorney Tom Mooney

Executive Session was called to order at 6:50 p.m.

### **DISCUSSION:**

Discussion concerning Brian Burke v. Bristol Board of Education (Litigation), Civil Case No.: 3:24-cv-01404-MPS. End of discussion at 7:32, and attorneys left the session.

Discussion concerning the appointment and employment contract for a Deputy Superintendent.

Discussion concerning the appointment and employment contract for a Superintendent of Schools.

Executive Session ended at 8:19 p.m.

#### **4. Reconvene into Public Session to take any votes on matters discussed in Executive Session.**

On a motion made by Eric Carlson, seconded by Russell Anderson, the Board voted to Reconvene into Public Session to take any votes on matters discussed in Executive Session. Motion Passed Unanimously. (8:20 p.m.).

Board confirmed that no votes were taken in Executive Session.

#### **Brian Burke v. Bristol Board of Education (Litigation), Civil Case No.: 3:24-cv-01404-MPS**

**Motion:** That the Board of Education approve the settlement of the action entitled Brian Burke v. Bristol Board of Education as recommended by legal counsel, and to authorize the chair to execute any necessary documents to complete the settlement.

Motion made by Maria Simmons, seconded by Dante Tagariello. Motion Passed Unanimously.

#### **5. Adjournment**

With no other business to come before the board, the meeting should be adjourned. (8:20 p.m.).

Respectfully Submitted,



Recording Secretary  
Bristol Board of Education

Enrollment Data of : 4/1/2025								1-Apr-25	1-Apr-24
<b>Edgewood PreK Academy</b>	Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7		<b>Total Prev. Yr.</b>
a.m.	10	13	13	15	11	10	10	82	
p.m.	15	13	13	15	14	16	12	98	
	Section 8	Section 9	Section 10	Section 11	Section 12	Section 13			
a.m.	10	11	13	11	11	7	5	68	
p.m.	15	14	14	15	14	8	2	82	
Community Based Speech	18								
Total Grade Level Enrollment								146AM/ 178PM	
<b>TOTAL PREK STUDENTS</b>								348	326

<b>Edgewood K-5 (2022-23)</b>	<b>250</b>
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<b>Elementary Schools</b>	
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<b>Hubbell</b>	Gr. K	1	2	3	4	5	Total	
	17	19	20	23	20	25		
	13	19	20	21	19	24		
	17	19	21	22	19	25		
<b>Total Section Enrollment</b>	<b>47</b>	<b>57</b>	<b>61</b>	<b>66</b>	<b>58</b>	<b>74</b>	<b>363</b>	<b>386</b>

1740

<b>Greene-Hills</b>	Gr. K	1	2	3	4	5	Total	
	21	23	20	23	20	21		
	20	21	19	22	21	22		
	22	23	20	20	21	22		
	22	22	21	20	21	23		
	21	23	20	22	21	21		
<b>Total Section Enrollment</b>	<b>106</b>	<b>112</b>	<b>100</b>	<b>107</b>	<b>104</b>	<b>109</b>	<b>638</b>	<b>639</b>

<b>Ivy Drive</b>	Gr. K	1	2	3	4	5	Total	
	22	22	23	25	20	25		
	21	22	22	24	22	24		
	22	21	25	26	23	24		
<b>Total Section Enrollment</b>	<b>65</b>	<b>65</b>	<b>70</b>	<b>75</b>	<b>65</b>	<b>73</b>	<b>413</b>	<b>395</b>

<b>MTV</b>	Gr. K	1	2	3	4	5	Total	
	18	19	19	21	17	26		
	18	17	22	23	16	26		
	19	14	23	21	15	26		
<b>Total Section Enrollment</b>	<b>55</b>	<b>50</b>	<b>64</b>	<b>65</b>	<b>48</b>	<b>78</b>	<b>360</b>	<b>361</b>

<b>South Side</b>	Gr. K	1	2	3	4	5	Total	
	19	20	19	24	22	24		
	20	19	19	24	20	25		
	17	21	18	24	22	24		
	20	22	18	25	22	25		
<b>Total Section Enrollment</b>	<b>76</b>	<b>82</b>	<b>74</b>	<b>97</b>	<b>86</b>	<b>98</b>	<b>513</b>	<b>513</b>

<b>Stafford</b>	Gr. K	1	2	3	4	5	Total	
	17	21	24	25	19	24		
	18	17	22	25	19	26		
	17	19	22	25	19	25		
<b>Total Section Enrollment</b>	<b>52</b>	<b>57</b>	<b>68</b>	<b>75</b>	<b>57</b>	<b>75</b>	<b>384</b>	<b>374</b>

West Bristol	Gr. K	1	2	3	4	5	Total	
	17	20	21	23	24	22		
	17	20	20	22	25	23		
	18	20	20	22	26	22		
	17	20	20	23	25	23		
	17	20	21	22		23		
<b>Total Section Enrollment</b>	<b>86</b>	<b>100</b>	<b>102</b>	<b>112</b>	<b>100</b>	<b>113</b>	<b>613</b>	<b>596</b>

<b>TOTAL K-5 ENROLLMENT</b>	<b>3,284</b>	<b>3264</b>
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**Middle Schools**

	6	7	8	Total	
<b>BAIMS</b>	88	86	84	<b>258</b>	
<b>Chippens Hill</b>	179	213	193	<b>585</b>	
<b>Greene-Hills</b>	107	86	106	<b>299</b>	
<b>Northeast</b>	94	115	124	<b>333</b>	
<b>West Bristol</b>	80	90	81	<b>251</b>	
<b>Total</b>	<b>548</b>	<b>590</b>	<b>588</b>		

<b>TOTAL 6-8 ENROLLMENT</b>	<b>1726</b>	<b>1751</b>
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**High School**

	9	10	11	12	Total	
<b>BCHS w/o programs below</b>	296	289	299	256	<b>1140</b>	
<b>BEHS w/o programs below</b>	294	243	232	267	<b>1036</b>	
<b>BPA</b>	5	12	17	18	<b>52</b>	
<b>Total</b>	<b>595</b>	<b>544</b>	<b>548</b>	<b>541</b>		

<b>TOTAL 9-12 ENROLLMENT</b>	<b>2228</b>	<b>2271</b>
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**Special Education Program: Citywide**

	Total	
<b>Destinations K-5</b>	<b>14</b>	
<b>Destinations 6-8</b>	<b>5</b>	<b>32</b>
<b>Destinations 9-12</b>	<b>13</b>	
<b>PROP (reported to state)</b>	<b>122</b>	<b>122</b>
<b>ACCESS</b>	<b>13</b>	<b>16</b>
<b>Community/Vocational Program</b>	<b>27</b>	<b>29</b>
<b>B-TECH**</b>	<b>17**</b>	<b>28**</b>

<b>Students attending magnet school programs or public school in districts other than BPS</b>	<b>297*</b>	<b>297*</b>
<b>TOTAL DISTRICT ENROLLMENT</b>	<b>7,780</b>	<b>7,811</b>

Elementary Class Size Guidelines Kdg = 22 Gr. 1 - 2 = 23 Gr. 3 - 5 = 28	*Not included in District Enrollment Total. **B-TECH -students are counted in homeschool enrollment, thus not included in District enrollment total
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**Elizabeth A. David**

## **OBJECTIVE**

To obtain a special education teaching position where I can work with interdisciplinary teams of highly motivated educators to help students reach their highest potential, become life-long learners, and successful citizens.

## **CERTIFICATIONS**

Connecticut Professional Teaching Certification, Special Education, K-12

English Language: Literature and Composition

Orton Gillingham Plus Reading Program

## **EDUCATION**

**Fairfield University** – Fairfield, CT

Master of Arts in Special Education, May 2009

**Plymouth State University** – Plymouth, NH

Bachelor of Arts in English, May 2003

## **KEY SKILLS**

- Behavioral Intervention Plans (BIPs)
- Progress Monitoring & Data Collection
- IEP Development & Case Management
- Co-teaching & Collaboration
- Specialized Literacy & Numeracy Programs

## **EDUCATIONAL EXPERIENCE**

**Avon Public Schools** – Avon, CT

*Special Education Teacher, Middle School*

August 2023 – Present

- Provided individualized reading instruction using the Orton Gillingham approach
- Provided individualized reading instruction using SPIRE
- Instructed students with learning disabilities within the resource setting
- Facilitated team meetings with parents and support staff
- Proficient in CT-SEDS
- Implemented Behavior Plans and designed specialized instruction for students with disabilities.
- Co-taught English Language Arts (ELA), Math, and Science classes.
- Collaborated with general education teachers, Speech-Language Pathologists (SLPs), Social Workers, and Counselors.
- Assessed students using the C-TOPP, WJ-III, PPVC, GORT, WIAT, Key-Math, and TOWRE, as well as transition assessments
- Wrote evaluation reports for students entering special education as well as providing updated assessment results for student with disabilities
- Supervised paraprofessionals and provided support for IEP implementation.
- Monitored student progress and goals through data collection platforms (e.g., easyCBM, Google Sheets, IXL).
- Developed and delivered professional development on transition skills and goal-setting.
- Integrated AI tools to increase student engagement.
- Created a platform for general education teachers to access modified materials for general education teachers.
- Participated in Planning and Placement Team (PPT) meetings.
- Participated in Student Assistance Teams (SAT)

**Granby Public Schools – Granby, CT**

*Special Education Teacher (High School)*

*August 2015– June 2023*

- Managed Individualized Education Plans (IEPs) using CT-SEDS.
- Co-taught Pre-AP English 9
- Participated in SRBI team collaborations.
- Administered assessments, including triennial testing and academic testing for students referred to special education.
- Wrote annual and triennial reports
- Led Professional Learning Community (PLC) and trained staff in various teaching methodologies.
- Developed and implemented literacy programs for students with Dyslexia and reading comprehension disabilities.
- Collaborated with student support services to assist students with Social and Emotional disabilities.
- Created and presented modified curriculum materials to Special Education Parent Teacher Organizations.
- Facilitated Home School Collaborative meetings
- Supported Outplaced students as they transitioned back to the high school

**Wethersfield Public Schools – Wethersfield, CT**

*Special Education Teacher (Middle/High School)*

*August 2013 – June 2015*

- Applied Discrete Trial Interventions (DTI) and Applied Behavior Analysis Therapy in lesson planning.
- Supported students with multiple disabilities, ASD, Down Syndrome, SLD, Dyslexia within a resource setting.
- Developed and implemented curriculum for Adaptive Life Skills Program (ALS).
- Collaborated with Behavior Analysts, Speech and Language Pathologists, and Social Workers.
- Designed IEP goals
- Supervised paraprofessionals in behavioral interventions.
- Conducted Functional Behavioral Assessments (FBAs) and Behavior Intervention Plans (BIPs).
- Supported students with transition plans to post-secondary education.
- Progress Monitored student Progress using various platforms
- Wrote annual and triennial reports
- Instructed students within the resource setting focusing on executive functioning, read, math and writing goals and objectives
- Chaired PPT meetings

## **Ridgefield Public Schools – Ridgefield, CT**

*Special Education Teacher (High School)*

*August 2009 – June 2013*

- Directed Initial Evaluation and Diagnostic placements for students undergoing possible placement into Special Education.
- Provided remedial support and worked closely with students to ensure access to the general education curriculum
- Assessed students using the C-TOPP, WJ-III, PPVC, GORT, WIAT, Key-Math, and TOWRE, as well as transition assessments.
- Case managed in-district and out-placed students receiving special education services.
- Developed IEP goals and objectives using IEP Direct.
- Team taught English, Algebra, and Chemistry to support differentiated instruction within the general education setting
- Direct instruction in Literacy, Study Skills, and Transition.
- Taught students with learning disabilities, emotional difficulties, Down Syndrome, intellectual disabilities, and Autism.
- Co-chaired Child Study Team and SRBI programs.
- Advisor for Best Buddies International.

### **PROFESSIONAL DEVELOPMENT**

- Orton Gillingham Plus Certificate
- Specialized Program Individualized Reading Program (SPIRE)
- Linda Moodbell Visualizing and Verbalizing
- Wilson Reading Program
- Sarah Ward Executive Functioning Skills

March 7, 2025

To Whom it May Concern:

My name is Erica Clapp. I currently teach Kindergarten at West Bristol School. I have also taught second and third grade in years prior and have worked as an instructional support teacher as well. I am writing to express my interest in becoming a TEAM Mentor beginning March 2025.

I wish to be trained as a TEAM mentor/cooperating teacher because I am passionate about helping others learn and grow. Having a positive mentor can have a lasting impact on a beginning teacher as well as on the profession. Not only do I feel I have the necessary skills and experience to provide this kind of support to a new teacher, but I also feel strongly that our learning can be reciprocal. New ideas and fresh perspectives are essential to the field of education and its success. I am excited to build a professional and caring relationship with prospective teachers.

As someone who has experience working with students Pre K - 5, I feel this knowledge would benefit a beginning teacher. I understand the scope and sequence of necessary skills required in each grade level. With an undergraduate degree in the areas of Psychology and English, I feel this knowledge translates to the classroom. I use my background on a daily basis to foster a nurturing and positive community that makes all learners feel successful and valued. As a member of the Climate Committee (in addition to time spent in the District Climate Camp previously) as well as my previous experience with curriculum writing, I know I am able to provide the necessary support to a new teacher.

Please feel free to contact me with any questions. I look forward to hearing from you.

Sincerely,

Erica Clapp  
Kindergarten  
West Bristol School

## **TEAM Mentorship Application**

My name is Emily Colombie and I teach third grade at West Bristol School. As an educator I have taught third grade for the past six years at two different schools. I began my teaching career at Maloney Magnet School and transitioned to West Bristol School at the completion of my TEAM program in which I have educated students for the past four years.

As an educator navigating the education profession, TEAM program, and evaluative systems I relied heavily on my TEAM mentor as a guide, support, and bank of knowledge. My TEAM mentor, Ann Drewry, not only impacted me as a mentee but inspired me to lead others through mentorship. I wish to be trained as a team mentor and cooperating teacher to continue to lead studying, initial, provisional, and professional educators. The opportunity to mentor educators would not only develop my leadership skills but provide support to educators just as Ann Drewry provided to me. Entering the field of education can be daunting for studying and initial educators. Therefore, the opportunity to support them on their journey can create a lasting impact on their careers and mine as well as I will have the opportunity to work with new educators who contribute a wealth of new knowledge and experience in the field of education.

As an educator I currently hold the Provisional Educator certificate. I have served as an educator for six years now. Four years has been served in the Bristol Public School System and two years have been served in the Waterbury Public School System. I am prepared to work cooperatively as a team member to aid the educational growth of a student teacher or initial educator. At West Bristol School I have worked cooperatively with my team members to educate, support, and listen with the intentions of aiding them in professional growth. I am aware

of the commitment to improving the induction of initial educators in the teacher profession and prepared to dedicate the time necessary to best support a mentee and student teacher. Serving on school based committees such as AVID has provided me with the opportunity to commit to planning, learning, and implementing instructional practices. I believe the definition of commitment encompasses more than a time commitment and also includes fidelity and consistency. Attending the AVID Summer Institute for two years and then serving on the school based committee requires my commitment to implementing, preparing, and researching best practices. In addition, I have committed my time to the students of West Bristol by hosting and supporting after school clubs such as Lego League, 24 Game, and Talent Show. All three experiences have prepared me and made me aware of the time and consistent commitment supporting students and educators requires. As a leader in my school community and grade level I can relate effectively to adults and adult learners through shared experiences and expression of interest in others. Shared experiences and the expression of interest in others develops a relationship with educators or individuals in which you can be honest, reflective, and articulate educational practices. My wealth of knowledge in the Common Core Standards and how to effectively plan for and implement instruction has prepared me to have honest and reflective articulate discussions about educational practices. Effectively planning for instruction by strategically embedding North Star Practices, AVID Strategies, and learning the interests of the demographic of students enhances the implementation of grade three curriculum. I strongly believe I have the qualifications to be a mentor or cooperating teacher. In addition, I am prepared to continue to learn as a leader by asking questions, researching, and listening to support a mentee or student teacher.

Griffin Colopy  
Greene-Hills School  
8th Grade ELA  
02/10/2025

Dear Team Coordinating Committee and Bristol Board of Education,

I am excited to submit my application to become a mentor and/or cooperating teacher for new educators in the district. Throughout my career, I have benefited greatly from the mentorship of experienced teachers, whose guidance made a profound impact on my personal and professional growth. It's safe to say that I owe a lot to the educators who took the time to mentor me throughout my career. Now, with over eight years in the teaching profession—first in Danbury and now in Bristol—I am eager to give back by supporting new teachers as they navigate the early stages of their careers.

I have extensive knowledge of the pillars of the Connecticut Common Core of Teaching and I understand the importance of intentional lesson planning, effective instruction, and ongoing reflection. These skills have been further developed through my participation in the TEAM and my certification in the program as a mentor. My experience mentoring three beginning teachers in Danbury gave me a deep appreciation for the impact of structured support and collaboration in a teacher's early years. I also found that mentoring offers a rare opportunity for me to learn from incoming teachers and improve my own professional craft.

Beyond my classroom experience, I have taken an active role in the Bristol school community. This year, I took on an after-school tutoring position and currently serve on both the yearbook and SLT committees. I have also prioritized ongoing professional development, attending all optional North Star support training sessions and participating in last summer's Climate PD and High-Quality Instruction session, where I observed teachers across grade levels refining their craft.

One of the greatest joys of working in middle school has been the opportunity to collaborate with my colleagues, sharing strategies, ideas, and insights to strengthen our collective practice. I believe that my preference for collaboration would make me a strong mentor, helping a new teacher find their own path in this challenging yet deeply rewarding profession.

I would welcome the opportunity to contribute to the district's commitment to teacher development and support. Thank you for your time and consideration—I look forward to the possibility of discussing how I can serve in this role.

Sincerely,

Mr. Griffin Colopy



# BRISTOL CENTRAL HIGH SCHOOL

480 Wolcott Street  
P.O. Box 700  
Bristol, CT 06011-0700  
860-584-7735  
Fax: 860-584-7713

*Be Creative, Be Conscientious, Be Collaborative, Be Committed*

Peter L. Wininger, *Principal*

Ryan M. Broderick, Ed.D., *Assistant Principal*

Geoffrey C. Sinatro, *Assistant Principal*

February, 25, 2025

Office of Teaching and Learning,

My name is Kenneth Gardiner and I am currently in my 18 year as a High School Social Studies educator. In my career I have taught various Social Studies courses for 9-12 graders. My career began in 2006 and I spent 12 years at Ellington High School before teaching the last 6 at Bristol Central. Currently my schedule consists of teaching AP Psychology, AVID, and Modern American History. I am submitting my application to become a TEAM Mentor/Cooperating Teacher for the March, 2025 due date.

Becoming a TEAM Mentor/Cooperating Teacher is something I have thought about many times during my career. I have many fond memories and deep appreciation for my own student teaching cooperative teacher and the many other teachers who have served as a mentor for me through my career. I certainly would not be the teacher I am today if it were not for the valuable learning experiences and collaboration these teachers have offered to me through the years. It is because of these positive and formative experiences that I desire to share my talents and guidance with a beginning educator. It is my motivation to give back to beginning educators and this is at the forefront of my desire to become a TEAM Mentor/Cooperating Teacher. I feel that I can be a positive force to help introduce and develop the practices of beginning educators. A second reason I would like to become a TEAM Mentor/Cooperating Teacher is to engage in the reflective practices that benefit new and experienced teachers. I truly enjoy and invite the collaborative aspects of teaching. I feel that an educator's best work happens when there is a sharing of ideas; some of my best experiences have come out of co teaching experiences and professional learning groups with colleagues. Even though most lessons are delivered alone with my students, I invite the collaborative, reflective practice that has certainly transformed my career.

As an educator with 18 years experience I feel that there is much I can bring to the TEAM Mentor/Cooperating Teacher program. At this point in my career I feel that I have developed a sound methodology for planning and instruction. Through my career my evaluative ratings have been consistently high and I value the feedback I receive from administrators and peers, using the feedback as part of a reflective process, not viewing it as threatening. It is of my opinion that my administrators and colleagues would describe me as a collaborative professional. Whether it is during professional learning, department meetings, or IIT work I always welcome the opportunity to work alongside colleagues, planning and discussing instructional strategies to meet the needs of students. Teaching can be an isolating profession at times and I try to do everything in my power to change that. This includes inviting colleagues in to observe lessons and reaching out to colleagues with questions or discussions around planning.

In my career I have always strived to be a resource to other educators when I can be. Especially now as an experienced teacher I have welcomed Uconn students and beginning teachers to observe and discuss teaching methodology. I enjoy sharing my planning ideas and I also like to hear the ideas of other educators as it often leads me to new understandings and keeps my planning and instructional ideas fresh. A highlight of the past 6 years teaching at BCHS has been my role as an AVID Elective Teacher. I have thoroughly enjoyed this role as I have formed deep connections with students and also have developed strong working relationships with counselors and AVID tutors. It has been a pleasure working with the tutors who have an interest in

***BCHS Mission Statement***

*BCHS promotes an environment wherein all members of its community employ 21st century skills to become creative thinkers, conscientious problem-solvers, collaborative learners and committed citizens in a global society.*

education and are being introduced to education from the professional side. I feel that I have served them as a mentor and have given them the freedom to create and conduct lessons, allowing them to be a co teacher of the elective class.

I would consider one of my strengths as an educator to be my reflective process. Being a reflective teacher is something I feel I do better today than at any point in my career. I try to incorporate this practice not only into my individual reflection but also try to make this a key part of my collaborative learning. A specific example which exemplifies many of the above mentioned qualities is when I recently encouraged my AVID tutor to develop and teach a socratic seminar with the AVID elective class. The tutor and I discussed the objectives we would like students to meet and I reviewed materials and helped the tutor adjust during the planning stage. The tutor next conducted the lesson and after we further discussed strengths/needs of the lesson and changes which might be beneficial for the future. The experience went very well for both the tutor and myself and I honestly learned just as much as the tutor by working through this reflective process closely. Another example which demonstrates my collaborative practice is the work accomplished during IIT time. This time serves as valuable time to not only plan and create learning activities/assessments, but also the fact that it is done collaboratively is an immense benefit. I greatly appreciate the ability to put minds together and hear new instructional ideas which ultimately helps me to be a better educator. A few other ways I have grown as an educator have been in seeking out various professional growth opportunities which include AVID trainings, College Board trainings, and district curriculum development. These collaborative experiences have helped me become a better educator while learning from administrators and peers. I have learned through my experiences that my development as an educator has been fostered the most by collaboration and reflection. I look forward to the opportunity to use my own learning and experiences to help develop future educators.

Sincerely,

Kenneth Gardiner

BCHS Social Studies

***BCHS Mission Statement***

*BCHS promotes an environment wherein all members of its community employ 21st century skills to become creative thinkers, conscientious problem-solvers, collaborative learners and committed citizens in a global society.*

Michelle Guastella

Chippens Hill Middle School

Grade 6 Science

21 February 2025

### **TEAM New Mentor Letter**

#### **Why I Wish to Be Trained as a Mentor/Cooperating Teacher**

Teaching is an incredibly rewarding yet challenging profession, and the support a new teacher receives can determine their long-term success and passion for the field. I have a deep commitment to mentoring new teachers because I know firsthand the impact a strong mentor can have. When I was a student teacher, I was surrounded by educators who uplifted and guided me, and I strive to provide that same encouragement to a new teacher in my building.

My cooperating teacher at Naugatuck High School played a critical role in shaping me into the educator I am today. He gradually released control of the classroom to me, allowing me to experiment with different classroom management techniques and instructional strategies. Rather than discouraging me from trying new approaches, he encouraged my evaluative thinking to ensure I was making pedagogically sound decisions. If something didn't go as planned, he never responded with an "I told you so" attitude. Instead, he provided constructive feedback, shared research-based strategies, and helped me reflect on how I could improve. Beyond teaching strategies, he helped me understand the importance of work-life balance—something that many new teachers struggle with. Because of his guidance, I was able to establish boundaries early on and sustain my passion for teaching.

Unfortunately, many aspiring teachers hear discouraging messages about the profession, being told it is not worth the effort. I was given that same warning, but thanks to the mentors I

## **Cover Letter- Guastella**

had, I was able to see the joy and fulfillment that teaching brings. I want to be that guiding voice for a new teacher—to help them discover their teaching style, develop confidence in their skills, and cultivate a lasting love for the profession.

## **What I Have to Offer as a Mentor**

I have been teaching for 4.5 years, primarily in middle school science. I have experience teaching both seventh and sixth grade science, in addition to my background in high school education through student teaching. Beyond my classroom experience, I hold leadership roles that have allowed me to support fellow educators. As the Co-Climate Coordinator for my school and the Science Curriculum Coordinator, I have led professional development sessions focused on analyzing science data, improving engagement strategies, and implementing effective instructional practices. I have also worked closely with the STEM supervisor to revise the sixth-grade science curriculum and spearheaded the development of district-wide Common Formative Assessments (CFAs) and End-of-Unit assessments. These experiences have deepened my understanding of curriculum development and best teaching practices, which I can share with a new teacher.

## Cover Letter- Guastella

### How I Support Students and Classroom Management Strategies

In my classroom, I am dedicated to fostering an inclusive, student-centered learning environment that supports all learners. I help struggling students by using **strategic seating charts**, pairing them with peers who excel to build confidence and provide peer support.

Additionally, I integrate **student leadership roles** into my classroom management system.

Students vote for peers to take on different responsibilities, such as:

- **Classroom Leader:** A student who sets a positive example and supports classmates.
- **Behavior Monitor:** Ensures classmates are prepared and engaged.
- **PBIS Coordinator:** Awards points for participation, preparedness, and engagement.

This structure creates a strong sense of classroom community and accountability. Because students elect their classroom leaders, they feel more invested in maintaining a positive learning environment. When behavioral challenges arise, I use restorative practices to help students reflect on their actions and learn from their mistakes, rather than relying solely on punitive measures.

I also have experience working with special education students and multilingual learners (MLLs). In my classroom, I ensure that these students are fully integrated rather than isolated in specific seating areas. To support my MLL students, I encourage peers to assist by keeping Google Translate open on their Chromebooks, fostering a welcoming and inclusive environment. This approach not only helps MLL students build their English vocabulary but also teaches general education students to embrace and support diverse learners. Pairing MLL and special education students together without intentional support can hinder their growth, so I take a more strategic approach to ensure they receive the necessary scaffolding while also being fully included in the classroom community.

## **Cover Letter- Guastella**

### **Conclusion**

I believe that the transition from student teacher to full-time educator is one of the most pivotal moments in a teacher's career. Without strong mentorship, talented new educators may struggle and leave the profession before they have the chance to find their stride. I want to be a mentor so I can help guide new teachers through this challenging yet rewarding journey—offering the same level of support, encouragement, and constructive feedback that I was fortunate enough to receive. With my experience in teaching, curriculum development, professional development leadership, and student-centered management strategies, I am confident that I can provide a beginning teacher with the guidance they need to succeed.

Jordan Rebello  
Greene-Hills School  
7th ELA teacher  
Date of application: 2/13/25

To Whom it May Concern:

My name is Jordan Rebello, and I have been teaching for nearly a decade. At this point in my career, I find that I am consistently looking for more ways to engage in the district. As someone that has coached two different sports, run three different after school clubs, and been involved in a wide array of committees, such as SLT, climate, and AVID, I believe that the next step in my career is to use the collective knowledge and experience I have accumulated over the last decade to assist new and upcoming teachers in their career. In the last few years, I have taken it upon myself to be as helpful to new teachers as possible. I consider myself to be a point person for several teachers that have recently begun in our district, and moving forward I would like to do so with more fidelity and purpose. It is for this reason that I wish to be trained as a mentor and cooperating teacher.

I believe that I have a wealth of knowledge and experience to offer incoming teachers and students. After teaching 8th grade ELA in Indiana for four years, I have spent the last five years teaching 7th grade ELA here in Bristol, CT. While I may only hold the provisionally license currently, my intentions are to transition to the professional license by the end of next school year. In the nearly decade of teaching experience that I have accumulated, I have worked cooperatively on a variety of committees ranging from SLT and Climate committee, to programs like AVID (including embarking on a 3 day training program in Tampa Florida for AVID). These programs and committees have given me ample practice and experience working with adult learners. Furthermore, I would even consider myself an adult learner at the time of this application, as I am currently working to complete my Master's program for a M.ED in Secondary English. As I work with the other adult learners in the class, I am often reminded that I truly love helping others learn and succeed.

March 7, 2025

To Whom It May Concern:

I have been a teacher at Greene Hills School for the past 25 years. I taught fourth and fifth grade for eight years, and have spent the rest of my career at the kindergarten level. It is here where I found my true passion and love. During my time at Greene Hills School, I have experienced many changes in regards to colleagues and administrators as well as major shifts in the curriculum. These constant changes have provided multiple opportunities for me to lead an ever changing kindergarten team, help support their transition into our school community, and acclimate new teachers with the current curriculum.

I take great pride in being the only kindergarten teacher that has remained constant over the past 17 years at Greene Hills School. I have devoted a lot of time and energy into working with the many teachers that have come to Greene Hills, all of whom came with a varied background in teaching. Collaborating with my colleagues has required me to be an open-minded leader ready to exchange ideas. Clear and transparent communication has helped get my team up to speed quickly and efficiently in regards to the curriculum expectations. I have worked to build and often rebuild the kindergarten team by establishing a strong rapport among all of my colleagues and worked to foster an environment that is based on high expectations, a strong work ethic, mutual respect, and trust.

My commitment to my role as an educator goes beyond teaching in the classroom. I have served on the SLT Team at Greene Hills, been part of the Kindergarten Transition Team, and worked on many curriculum committees during both the school year and summer months. I also take part in school wide book clubs that discuss topics directly related to the students I teach. In addition to my teaching, I also coached volleyball at Bristol Eastern High School for 23 years and was recently inducted into the Bristol Sports Hall of Fame as well as the Connecticut Volleyball Hall of Fame.

These experiences have solidified my strength as a mentor and leader. Working with others to create a clear vision and set goals is what I do best. I enjoy the planning and engagement that comes with working with others towards a common goal. I have the patience, experience, and passion to help others navigate their way into education. I thrive on being able to teach and help others. Using my experience as a teacher and coach, I am confident that I will positively guide new teachers with a gentle hand and a motivating spirit that will help them succeed as future educators.

Sincerely,

***Stacy Rivoira***

Stacy Rivoira

Sandra Robair  
Bristol Central High School  
ECE Biology, AP Biology, Biotechnology, Anatomy & Physiology, Biology  
[sandrarobair@bristolk12.org](mailto:sandrarobair@bristolk12.org)  
860-997-4847

To whom it may concern,  
Bristol Board of Education  
129 Church Street  
Bristol, CT 06010

Dear Members of the board,

I am writing to express my interest in the TEAM Mentor/Cooperating Teacher position at Bristol Public Schools. With over eight years of teaching experience, including three years within this district, I am excited about the opportunity to contribute to the professional development of beginning teachers and to support their growth through mentorship and collaboration.

As a holder of the Provisional Educator Certificate, I have consistently demonstrated effective teaching practices as outlined by the Connecticut Common Core of Teaching. I am committed to fostering a positive learning environment that encourages critical thinking, student engagement, and academic achievement, all of which align with the goals of the TEAM program.

My approach to teaching is rooted in reflection and a commitment to continuous improvement. I believe strongly in the value of collaboration and am eager to work as part of a team to support beginning teachers. Through ongoing feedback, observation, and meaningful dialogue, I aim to guide new educators in developing their teaching practices, while also providing them with the tools to navigate the challenges of the classroom.

Additionally, my ability to relate effectively to adult learners has been a key strength in my career. I pride myself on being approachable and open to dialogue, ensuring that those I work with feel comfortable discussing challenges and successes. I am also deeply committed to my own professional growth, participating in various non-mandated professional activities, and serving on

school-based and district committees. This experience has allowed me to stay current with best practices and contribute meaningfully to the educational community.

I am excited about the prospect of becoming a TEAM Mentor/Cooperating Teacher, where I can combine my passion for teaching with my desire to help foster the next generation of educators. I look forward to the opportunity to contribute to the district's ongoing efforts to support and guide new teachers as they embark on their careers.

Thank you for considering my application. I would welcome the chance to discuss my qualifications in more detail. I look forward to hearing from you.

Sincerely,  
Sandra Robair, M.A.

Dear BPS,

I am writing to express my interest in Mentorship within the Bristol Public School District]. With over 20 years of experience in education, I have dedicated my career to supporting teachers and improving student learning outcomes. Currently, I serve as a math coach, working closely with grades 6-8 math teachers to enhance instruction, develop best practices, and ensure student success.

Previously, I served as a mentor in North Carolina, where I supported teachers new to the district and the profession. I firmly believe that assisting educators in transitioning into a new district and/or school is critical to their success and, ultimately, to student achievement. My passion for coaching and mentoring stems from my ability to witness firsthand the impact that strong instructional support has on both teachers and students.

Throughout my career, I have worked in diverse educational settings, including Title 1 schools with 90% free and reduced lunch populations, as well as one of the highest-performing districts in North Carolina. These experiences have provided me with a broad perspective on instructional equity, systemic challenges, and the importance of high-quality professional development. I have collaborated with teachers and administrators to provide feedback, facilitate district-level professional development, develop benchmark assessments, and contribute to curriculum design. Additionally, I have worked closely with superintendents and district leadership to establish equitable systems that support both educators and students.

Since joining Bristol Public Schools in August 2022, I have continued my commitment to instructional excellence. I currently coach at two schools, providing direct support to at least 12 math teachers and other support staff. My formal and informal evaluations have been consistently positive, reflecting my ability to build strong relationships and drive instructional improvement. I am an active member of NCTM, NCSM, ATOMIC, and serve as the treasurer for CCLM, as well as participating in various district committees. Furthermore, I have engaged in professional learning with Jim Knight and Elena Aguilar, whose work in adult learning and relationship-building deeply aligns with my coaching philosophy.

Thank you for your time and consideration. I look forward to hearing from you soon.

Sincerely,

Friecka Baldwin

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Kindergarten ELA	Literacy	Kindergarten	N/A
<b>Course Description:</b>			
<p>In Grade K, students participate in a structured literacy block that includes oral language, phonological awareness, phonics, fluency, vocabulary, comprehension, and writing. Students study compelling topics through engaging texts. Teachers and students use the Heggerty program, Foundations program, Flyleaf, Geodes and Heggerty small group readers, as well as the Wit &amp; Wisdom program to engage in the structured literacy block. The Wit &amp; Wisdom framework of inquiry helps students build rich layers of knowledge. Wit &amp; Wisdom’s integrated approach to learning enables students to activate and develop content and vocabulary knowledge while learning skills. In each module, students write about what they read, learn grammar, and then articulate the meaning of each text in formal and informal discussions with their peers. The Wit &amp; Wisdom approach helps teachers celebrate the joy of reading and writing with students, while also supporting all learners in meeting the rigor of the ELA standards. By reading engaging texts and participating meaningfully in their learning, students develop the knowledge and skills they need to be successful readers, critical thinkers, and effective communicators who love to learn and can succeed in college and careers.</p> <p>Through a rigorous and careful module design, students gain content knowledge and an awareness of how to read texts, write, speak, and listen. Each of the four modules in Kindergarten has a topical focus. For each module, students read—or, in the case of younger students, hear read aloud—a series of authentic texts on the topic and consider those texts critically and systematically. Frameworks of questioning, the Content Stages and Content Framing Questions, engage students in the content and in the process of reading complex texts. Content Framing Questions guide students’ daily work of encountering, understanding, and analyzing complex text. Students then distill each text’s deeper meaning and, finally, articulate how the texts, individually and collectively, build their knowledge of the topic.</p> <p>Throughout each module, standards are addressed in an integrated manner. Instead of addressing and assessing standards one by one, in isolation, the curriculum teaches reading, writing, speaking, listening, and language in an integrated manner so that students learn all skills in the context of module content. This integrated approach enables students to activate and build on their developing background and vocabulary knowledge of the module topic while learning skills in other areas.</p> <p>In Grade K, students participate in 4 units/modules centered around the five senses, studying farms, how America changed over time, and the continents.</p> <p>Please see module overview below.</p>			

Grade	Module 1	Module 2	Module 3	Module 4
K	<p><b>The Five Senses</b></p> <p><b>Essential Question:</b> How do our senses help us learn?</p> <p><b>Module Summary:</b> The five senses help humans experience, learn, and communicate about the world.</p> <p><b>Knowledge Goals:</b> Recognize and describe the five senses and related body parts.</p> <p>Identify rhyme and repetition within texts.</p> <p>Describe the use of color and shape in visual art.</p> <p><b>EOM Writing Type:</b> Informative</p> <p><b>EOM Task:</b> Students write a book describing how the five senses help both them and a character from a text learn about the world.</p>	<p><b>Once Upon a Farm</b></p> <p><b>Essential Question:</b> What makes a good story?</p> <p><b>Module Summary:</b> Stories of farm life and animals lead to a discovery of the universal elements of well-crafted stories.</p> <p><b>Knowledge Goals:</b> Identify the differences among the seasons and how they affect life on the farm.</p> <p>Describe key details about different farm animals, including how they help humans.</p> <p>Retell classic folktales featuring farm animal characters, using various story elements as a guide.</p> <p>Understand the elements that make up a narrative and how these elements work together to create a cohesive story.</p> <p><b>EOM Writing Type:</b> Narrative</p> <p><b>EOM Task:</b> Students write an original narrative, set on Maple Hill Farm, featuring one farm animal they learned about in the module.</p>	<p><b>America, Then and Now</b></p> <p><b>Essential Question:</b> How has life in America changed over time?</p> <p><b>Module Summary:</b> While people's basic needs may not change over time, the ways that people meet their needs do change, as new inventions and innovations take hold.</p> <p><b>Knowledge Goals:</b> Understand the difference between the past and the present.</p> <p>Identify how aspects of life in America—specifically, home life, school life, transportation, and communication—have changed.</p> <p>Describe key details about how the topics of home, school, transportation, and communication have changed over time.</p> <p>Understand how a main topic or topic statement is supported by key details.</p> <p><b>EOM Writing Type:</b> Informative (Research)</p> <p><b>EOM Task:</b> Students create an informative poster to explain how one aspect of life in America has changed over time.</p>	<p><b>The Continents</b></p> <p><b>Essential Question:</b> What makes the world fascinating?</p> <p><b>Module Summary:</b> The world's splendor comes to life through an examination of the unique natural features, animals, and activities of Earth's seven continents.</p> <p><b>Knowledge Goals:</b> Identify the seven continents.</p> <p>Describe the different natural features, things to do, and animals on each continent.</p> <p>Demonstrate understanding of maps and their purpose.</p> <p>Understand how illustrations, photographs, and words in a text communicate important information.</p> <p><b>EOM Writing Type:</b> Opinion</p> <p><b>EOM Task:</b> Students sort module texts into informational texts and stories. They then create a travel brochure for a chosen continent.</p>

**Aligned Core Resources:**

Wit & Wisdom slide decks

**Connection to the *BPS Vision of the Graduate***


Communication

- Articulates thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
- Utilize multiple media and technologies, and know how to judge their effectiveness as well as assess their impact
- Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions. Use communication for a range of purposes


- (e.g. to inform, instruct, motivate and persuade)
- Empathy
- Demonstrating understanding of others perspectives and needs
  - Understand the concept of community as a means for supporting others in need
- Critical Thinking and Problem Solving
- Collect, assess and analyze relevant information
- Civic Literacy
- Understand the local and global implications of civic decisions
  - Understand other nations and cultures including the use of non-English language

**Additional Course Information:**  
*Knowledge/Skill Dependent courses/prerequisites*

Link to [Completed Equity Audit](#)

 2025 K ELA Equity Curriculum Review

**Standard Matrix**

 WW\_GK3\_ScopeSequence.pdf

District Learning Expectations and Standards	Unit 1	Unit 2	Unit 3	Unit 4
<b>Reading Literature Standards</b>				
CSS.ELA-Literacy.RL.K.1 With prompting and support, ask and answer questions about key details in a text.	X	X	X	X
CCSS.ELA-Literacy.RL.K.2 With prompting and support, retell familiar stories, including key details.	X	X	X	X
CCSS.ELA-Literacy.RL.K.3 With prompting and support, identify characters, settings, and major events in a story.	X	X	X	X
CCSS.ELA-Literacy.RL.K.4 Ask and answer questions about unknown words in a text.	X	X	X	X
CCSS.ELA-Literacy.RL.K.5 Recognize common types of texts (e.g., storybooks, poems).	X	X	X	X
CCSS.ELA-Literacy.RL.K.6 With prompting and support, name the author and illustrator of a story and define the role of each in telling the story.	X	X		
CCSS.ELA-Literacy.RL.K.7 * With prompting and support, describe the relationship between illustrations and the story in which they appear (e.g., what moment in a story an				X

illustration depicts).				
CCSS.ELA-Literacy.RL.K.9 With prompting and support, compare and contrast the adventures and experiences of characters in familiar stories.		X		
CCSS.ELA-Literacy.RL.K.10 Actively engage in group reading activities with purpose and understanding.	X	X	X	X
Reading Informational Standards				
CCSS.ELA-Literacy.RI.K.1 With prompting and support, ask and answer questions about key details in a text.	X	X	X	X
CCSS.ELA-Literacy.RI.K.2 With prompting and support, identify the main topic and retell key details of a text.	X	X	X	X
CCSS.ELA-Literacy.RI.K.3 With prompting and support, describe the connection between two individuals, events, ideas, or pieces of information in a text.	X	X	X	X
CCSS.ELA-Literacy.RI.K.4 With prompting and support, ask and answer questions about unknown words in a text.	X	X	X	X
CCSS.ELA-Literacy.RI.K.5 Identify the front cover, back cover, and title page of a book.	X	X	X	
CCSS.ELA-Literacy.RI.K.6 Name the author and illustrator of a text and define the role of each in presenting the ideas or information in a text.	X		X	
CCSS.ELA-Literacy.RI.K.7 With prompting and support, describe the relationship between illustrations and the text in which they appear (e.g., what person, place, thing, or idea in the text an illustration depicts).	X	X	X	X
CCSS.ELA-Literacy.RI.K.8 With prompting and support, identify the reasons an author gives to support points in a text.			X	X
CCSS.ELA-Literacy.RI.K.9 With prompting and support, identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).	X	X	X	X
CCSS.ELA-Literacy.RI.K.10 Actively engage in group reading activities with purpose and understanding.	X	X	X	X
Speaking & Listening Standards				

CCSS.ELA-Literacy.SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.	X	X	X	X
CCSS.ELA-Literacy.SL.K.1.a Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).	X	X	X	X
CCSS.ELA-Literacy.SL.K.1.b Continue a conversation through multiple exchanges.	X			
CCSS.ELA-Literacy.SL.K.2 Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.	X	X	X	X
CCSS.ELA-Literacy.SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.	X		X	X
CCSS.ELA-Literacy.SL.K.4 Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.	X	X		X
CCSS.ELA-Literacy.SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail.			X	
CCSS.ELA-Literacy.SL.K.6 Speak audibly and express thoughts, feelings, and ideas clearly.	X	X		X
<b>Writing Standards</b>				
CCSS.ELA-Literacy.W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book (e.g., My favorite book is ...).		X	X	X
CCSS.ELA-Literacy.W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.	X	X	X	X
CCSS.ELA-Literacy.W.K.3 Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.	X	X	X	X

CCSS.ELA-Literacy.W.K.5 With guidance and support from adults, respond to questions and suggestions from peers and add details to strengthen writing as needed.		X		X
CCSS.ELA-Literacy.W.K.6 With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.		X		
CCSS.ELA-Literacy.W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them)			X	X
CCSS.ELA-Literacy.W.K.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.	X	X	X	X
Language Standards				
CCSS.ELA-Literacy.L.K.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.	X	X	X	X
CCSS.ELA-Literacy.L.K.1.a Print many upper- and lowercase letters.		X		
CCSS.ELA-Literacy.L.K.1.b Use frequently occurring nouns and verbs.		X	X	X
CCSS.ELA-Literacy.L.K.1.c Form regular plural nouns orally by adding /s/ or /es/ (e.g., dog, dogs; wish, wishes).		X	X	
CCSS.ELA-Literacy.L.K.1.d Understand and use question words (interrogatives) (e.g., who, what, where, when, why, how).	X	X	X	X
CCSS.ELA-Literacy.L.K.1.e Use the most frequently occurring prepositions (e.g., to, from, in, out, on, off, for, of, by, with).	X	X		X
CCSS.ELA-Literacy.L.K.1.f Produce and expand complete sentences in shared language activities.	X	X	X	X
CCSS.ELA-Literacy.L.K.2 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.	X	X	X	X

CCSS.ELA-Literacy.L.K.2.a Capitalize the first word in a sentence and the pronoun I			X	X
CCSS.ELA-Literacy.L.K.2.b Recognize and name end punctuation.	X	X	X	X
CCSS.ELA-Literacy.L.K.2.c Write a letter or letters for most consonant and short-vowel sounds (phonemes).	X	X	X	X
CCSS.ELA-Literacy.L.K.2.d Spell simple words phonetically, drawing on knowledge of sound-letter relationships.	X	X	X	X
CCSS.ELA-Literacy.L.K.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on kindergarten reading and content.	X	X	X	X
CCSS.ELA-Literacy.L.K.4.a Identify new meanings for familiar words and apply them accurately (e.g., knowing duck is a bird and learning the verb to duck).	X	X	X	X
CCSS.ELA-Literacy.L.K.4.b Use the most frequently occurring inflections and affixes (e.g., -ed, -s, re-, un-, pre-, -ful, -less) as a clue to the meaning of an unknown word.	X	X	X	X
CCSS.ELA-Literacy.L.K.5 With guidance and support from adults, explore word relationships and nuances in word meanings.	X	X	X	X
CCSS.ELA-Literacy.L.K.5.a Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.	X	X	X	X
CCSS.ELA-Literacy.L.K.5.b Demonstrate understanding of frequently occurring verbs and adjectives by relating them to their opposites (antonyms).		X	X	X
CCSS.ELA-Literacy.L.K.5.c Identify real-life connections between words and their use (e.g., note places at school that are colorful).	X	X	X	X
CCSS.ELA-Literacy.L.K.5.d Distinguish shades of meaning among verbs describing the same general action (e.g., walk, march, strut, prance) by acting out the meanings.	X	X	X	X
CCSS.ELA-Literacy.L.K.6 Use words and phrases acquired through conversations, reading and	X	X	X	X

being read to, and responding to texts.

### Unit Links

*If unit headings are formatted as a heading, then we can link a Table of Contents to better organize and provide faster access to each unit*

[Module 1 The Five Senses](#)

[Module 2 Once Upon A Farm](#)

[Module 3 America Then and Now](#)

[Module 4 The Continents](#)

### Unit Title:

## Module 1 The Five Senses

### Relevant Standards: Bold indicates priority

See above

### Essential Question(s):

How do our senses help us learn?

### Enduring Understanding(s):

Students in Kindergarten will understand the following concepts as a result of this module:

- We have five senses: smell, taste, touch, hearing, and sight.
- Our senses take in information and make us aware of the world around us.
- People use their senses to learn about the world and to learn from books.
- Details in illustration, speech, and text provide more information for readers.
- Words and illustrations work together to tell a story and present information.

### Demonstration of Learning:

Students may demonstrate their learning within this unit in a variety of ways. Possible methods for this include (but are not limited to):



- Reading
- Writing
- Speaking
- Listening
- Analyzing text
- Using evidence

### Pacing for Unit

12 Weeks

- Engaging in discussions

**Family Overview (link below)** **Integration of Technology:**

-  WW\_GK\_M1\_FamilyTipSheet\_English.pdf
-  September Elementary K Memo

- Videos
- “Bojangles Step Dance”
  - “Eight-Year-Old Tap Prodigy Little Luke”
  - “Chicka Chicka Boom Boom”

**Unit-specific Vocabulary:** **Aligned Unit Materials, Resources, and Technology (beyond core resources):**

**Academic Vocabulary**

senses	notice	wonder
tableau	reveal	author
respond	prompt	essential meaning
enjoy	learn	whenever
whatever	every	aware
adjectives	Socratic Seminar	enough
alphabet	preposition	checklist

**Content Vocabulary**

city	shadow	piano
garbage	fire engine	rabbit
bananas	perfume	medicine
coin	knit	freedom
trick	palm	tuning
curlers	curb	rhythm
graffiti	witness	soup kitchen
familiar	wipers	freckled
duck	daydream	tangled
knotted	stooped	greet
art	folks	boom



- Picture Books (Informational)
- My Five Senses, Aiki
  - My Five Senses, Margaret Miller
  - Rap a Tap Tap, Leo Dillon and Diane Dillon
- Picture Books (Literary)
- Chicka Chicka Boom Boom, Bill Martin Jr. and John Archambault; Illustrations, Lois Ehlert
  - Last Stop on Market Street, Matt de la Peña; Illustrations, Christian Robinson
- Supplementary Texts/ Articles
- “Great Depression,” Britannica Kids
  - “The Harlem Renaissance,” Britannica Kids
- Paintings
- Flower Day, Diego Rivera
  - Le Gourmet, Pablo Picasso







Opportunities for Interdisciplinary Connections:	Anticipated misconceptions:
<p><b>Science:</b> The module directly teaches students about the anatomy and functions of the five senses, fostering early scientific inquiry and observation skills. It introduces the idea that our senses help us make sense of the world, and it explores sensory adaptation and environmental interactions.</p> <p><b>Social Studies:</b> The module connects to social studies by discussing how senses are involved in social interactions, how they help us navigate our communities, and how different cultures use sensory experiences. Additionally, it may touch on how community helpers rely on their senses in their work.</p> <p><b>Social Emotional Learning</b> The "Five Senses" module in <i>Wit &amp; Wisdom</i> not only introduces foundational science concepts but also promotes essential social-emotional skills. By reflecting on their own sensory experiences, students develop self-awareness and begin to recognize the connection between their senses and emotions. Activities that focus on regulating sensory input foster self-regulation skills, while group work and discussions encourage social awareness and the development of relationship skills. Through these activities, students learn to empathize with others, share their experiences, and collaborate effectively, all of which are key elements of social-emotional learning.</p>	<ul style="list-style-type: none"> <li>● Students may have misconceptions of: <ul style="list-style-type: none"> <li>○ Difference between the five senses</li> <li>○ Being able to use more than one sense at a time.</li> <li>○ All people experience the same sensory stimuli in the same way.</li> <li>○ My senses always work the same way all the time.</li> <li>○ Touching can only be done with the hands.</li> <li>○ I can only taste with my mouth.</li> </ul> </li> </ul>
Connections to Prior Units:	Connections to Future Units:
<ul style="list-style-type: none"> <li>● N/A</li> </ul>	<p>In Kindergarten, Module 1 on <b>The Five Senses</b>, there are many potential connections that can be made to future lessons. These connections help students build a foundation for understanding the world around them and expand on this knowledge as they progress. By connecting sensory exploration to a variety of subjects, you help students build an interconnected understanding of the world, making future learning more meaningful and engaging.</p>
Differentiation through <i>Universal Design for Learning</i>	
UDL Indicator	Teacher Actions:
2 Language & Symbols	<ul style="list-style-type: none"> <li>● Clarify vocabulary, symbols, and language structures (consideration 2.1)</li> <li>● Support decoding of text, mathematical notation, and symbols (consideration 2.2)</li> </ul>






<p>3 Building Knowledge</p> <p>9 Emotional Capacity</p> <p>1 Perception</p>	<ul style="list-style-type: none"> <li>• Cultivate understanding and respect across languages and dialects (consideration 2.3)</li> <li>• Address biases in the use of language and symbols (consideration 2.4)</li> <li>• Illustrate through multiple media (consideration 2.5)</li> <li>• Connect prior knowledge to new learning (3.1)</li> <li>• Highlight and explore patterns, critical features, big ideas, and relationships (3.2)</li> <li>• Cultivate multiple ways of knowing and making meaning (3.3)</li> <li>• Maximize transfer and generalization</li> <li>• Recognize expectations, beliefs, and motivations (9.1)</li> <li>• Develop awareness of self and others (9.2)</li> <li>• Represent a diversity of perspectives and identities in authentic ways (1.3)</li> </ul>
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**Supporting Multilingual/English Learners**






<b>Related <i>CELP standards:</i></b>	<b>Learning Targets:</b>
An EL with guidance and supports, can participate in short discussions, conversations, and short written exchanges using words and phrases acquired in conversations, reading, and being read to.	I can participate in conversations and discussions about the five senses.







<b>Lesson Sequence</b>	<b>Learning Target /Success Criteria/ Assessment</b>	<b>Resources</b>
1	LT: I can explain how our five senses help us learn. SC: I named the five senses. SC: I asked and answered questions about my five senses.	 00.01.L01.pptx
2	LT: I can explain how our five senses help us learn. SC: I identified key details. SC: I discussed the main topic.	 00.01.L02.pptx




3	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I communicated key details using pictures and words about my five senses.</p>	<p> 00.01.L03.pptx</p>
4	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used pictures and words to show the text's essential meaning.</p> <p>SC: I spoke in a complete sentence.</p> <p>SC: I described my senses using adjectives.</p>	<p> 00.01.L04.pptx</p>
5	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I explained the purpose of each of the five senses.</p> <p>SC: I described my senses using adjectives.</p>	<p> 00.01.L05.pptx</p>
6	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I asked and answered questions about my five senses.</p> <p>SC: I asked and answered questions about the important words in <i>My Five Senses</i>.</p>	<p> 00.01.L06.pptx</p>
7	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used the book to help me answer questions.</p> <p>SC: I identified key details.</p> <p>SC: I discussed the main topic.</p>	<p> 00.01.L07.pptx</p>
8	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used pictures and words to tell key details in <i>My Five Senses</i>.</p> <p>SC: I used evidence from the book to complete a sentence.</p>	<p> 00.01.L08.pptx</p>

	SC: I described my senses using adjectives.	
9	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used pictures and words to show the text’s essential meaning.</p> <p>SC: I used evidence from the book to complete a sentence.</p> <p>SC: I used adjectives to describe my senses.</p>	 00.01.L09.pptx
10	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I named examples of how my five senses help us learn about the world.</p> <p>SC: I named the parts of a book.</p> <p>SC: I described my senses using adjectives.</p>	 00.01.L10.pptx
11	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I asked questions about the text.</p> <p>SC: I asked and answered questions about important vocabulary.</p> <p>SC: I listened with all my senses.</p>	 00.01.L11.pptx
12	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I told the key events in the text.</p> <p>SC: I listened with all my senses.</p> <p>SC: I explained that some words have multiple meanings.</p>	 00.01.L12.pptx
13	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I answered questions about what senses CJ used.</p>	 00.01.L13.pptx

	<p>SC: I added details to my drawings about senses.</p> <p>SC: I used adjectives from Last Stop on Market Street in a sentence to describe real life experiences.</p>	
14	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used descriptive words and text evidence from Last Stop on Market Street to answer questions.</p> <p>SC: I added details from the text to my drawing about senses.</p> <p>SC: I told the parts of a complete sentence.</p>	 00.01.L14.pptx
15	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used pictures and words to show the text's essential meaning of Last Stop on Market Street.</p> <p>SC: I explained how CJ's senses helped him learned about the world.</p> <p>SC: I used complete sentences to tell about the pictures in Last Stop on Market Street.</p>	 00.01.L15.pptx
16	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I took turns when talking.</p> <p>SC: I explained how CJ's senses helped him learned about the world.</p> <p>SC: I named the job author and the illustrator in Last Stop on Market Street.</p> <p>SC: I used grade level vocabulary.</p>	 00.01.L16.pptx
17	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I asked questions about the events in Chicka Chicka Boom Boom.</p> <p>SC: I participated in labelling details in Flower Day.</p>	 00.01.L17.pptx

18	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I told key events and details from Chicka Chicka Boom Boom.</p> <p>SC: I labelled the Flower Day picture using the beginning sound I hear in the word.</p> <p>SC: I used descriptive words from Chicka Chicka Boom Boom to describe things in my life.</p>	<p> 00.01.L18.pptx</p>
19	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used pictures and words to tell key details in Chicka Chicka Boom Boom.</p> <p>SC: I labelled the Chicka Chicka Boom Boom picture using the beginning sound I hear in the word.</p> <p>SC: I spoke in complete sentences to tell the events in Chicka Chicka Boom Boom.</p>	<p> 00.01.L19.pptx</p>
20	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I named words and phrases that repeat in Chicka Chicka Boom Boom.</p> <p>SC: I used pictures and words to collect evidence to answer questions</p>	<p> 00.01.L20.pptx</p>
21	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used pictures and words to show the text's essential meaning in Chicka Chicka Boom Boom.</p> <p>SC: I used my five senses when reading Chicka Chicka Boom Boom.</p> <p>SC: I used grade level vocabulary. Assessment 21B</p>	<p> 00.01.L21.pptx</p>
22	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used my five senses when reading Chicka Chicka Boom Boom.</p>	<p> 00.01.L22.pptx</p>

	SC: I labeled my drawing with the sounds I hear.	
23	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I asked questions about key events, details, and words in <i>Rap a Tap Tap</i>.</p> <p>SC: I labeled a drawing with sounds I hear.</p> <p>SC: I asked and answered questions about important vocabulary.</p>	 00.01.L23.pptx
24	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I named key details in <i>Rap a Tap Tap</i>.</p> <p>SC: I labeled a drawing with sounds I hear.</p> <p>SC: I named prepositions words.</p>	 00.01.L24.pptx
25	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I explained how illustrations can help me understand more in <i>Rap a TapTap</i>.</p>	 00.01.L25.pptx
26	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I described how the words and sounds helped me understand more about <i>Rap a TapTap</i>.</p>	 00.01.L26.pptx
27	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I used pictures and words to show the text's essential meaning in <i>Rap a TapTap</i>.</p>	 00.01.L27.pptx
28	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I explained how the senses helped me learn from <i>Rap a TapTap</i>.</p>	 00.01.L28.pptx

29	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I showed my understanding of the unit by participating in conversations.</p>	 00.01.L29.pptx
30	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I explained how the senses help me learn.</p>	 00.01.L30.pptx
31	<p>LT: I can explain how our five senses help us learn.</p> <p>SC: I explained how the senses help me learn.</p> <p>SC: I wrote a book about how the senses help us learn about the world around us.</p>	 00.01.L31.pptx

**Unit Title: What Makes A Good Story?**

**Module 2 Once Upon A Farm**

**Relevant Standards: Bold indicates priority**

Content Standards: See above.

**Essential Question(s):**



- What makes a good story?

**Enduring Understanding(s):**

- Students in Kindergarten will understand the following concepts as a result of this module:
- Authors of informational texts teach us information about real life through their books.
  - Informational texts have main topics supported by key details that tell readers more about a topic.
  - Life at home and life at school in America have changed over time.
  - Modes of transportation and communication in America have changed over time.
  - Inventions make life easier and help people do things in new ways.

**Demonstration of Learning:**

**Pacing for Unit**

<p>Students may demonstrate their learning within this unit in a variety of ways. Possible methods for this include (but are not limited to):</p> <ul style="list-style-type: none"> <li>● Reading</li> <li>● Writing</li> <li>● Speaking</li> <li>● Listening</li> <li>● Analyzing text</li> <li>● Using evidence</li> <li>● Engaging in discussions</li> </ul>	<p>9 weeks</p>
<p><b>Family Overview (link below)</b></p>	<p><b>Integration of Technology:</b></p>
<p> WW_GK_M2_FamilyTipSheet_English.pdf</p> <p> December Elementary K Memo</p>	<p>Song</p> <ul style="list-style-type: none"> <li>● “Old MacDonald Had a Farm,” Kidsongs</li> </ul> <p>Videos</p> <ul style="list-style-type: none"> <li>● “Making Bread,” <i>Between the Lions</i> PBS</li> <li>● “Seasons Song,” Have Fun Teaching</li> </ul>
<p><b>Unit-specific Vocabulary:</b></p>	<p><b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b></p>

**Academic Vocabulary**

notice	run	dig
wonder	recall	Key details
leap	roll	scratch
sneak	Tip toe	Roll over
differences	expand	setting
characters	Elements	Character trait
illustration	pattern	Hand motion
problem/solution	Resolution	retelling
sun	seeds	Chicks
Farm animals		

**Content Vocabulary**

poem	voice	Swimming holes
Circula picture	strut	gallop
Waddle	season	Autumn
Opposites	Clothing	Story stones
sneak	lurk	creep
neigh	execute	jam
circle	Thresh	roar
trip	trap	beaks

## Picture Books (Informational)

- Farm Animals, Wade Cooper
- The Year at Maple Hill Farm, Alice and Martin Provensen

## Picture Books (Literary)

- The Little Red Hen, Jerry Pinkney
- The Three Billy Goats Gruff, Paul Galdone
- Three Little Pigs, Adaptation, Raina Moore; Illustrations, Thea Kliros

## Supplementary Texts

## Paintings

- American Gothic, Grant Wood
- The Cornell Farm, Edward Hicks

## Poem

- "Morning Is Come," Singing Together BBC

## Song

- "Old MacDonald Had a Farm," Kidsongs







## Videos







- "Making Bread," Between the Lions PBS
- "Seasons Song," Have Fun Teaching

**Opportunities for Interdisciplinary Connections:****Anticipated misconceptions:**

<ol style="list-style-type: none"> <li>1. <b>Social Studies:</b> Understanding rural communities, historical farming practices, and global farming traditions.</li> <li>2. <b>Language Arts:</b> Vocabulary development, reading farm-related stories, writing about farm life, and storytelling.</li> <li>3. <b>Science:</b> Learning about animals, plants, weather, and ecosystems on a farm, along with hands-on observation of growth and life cycles.</li> <li>4. <b>Mathematics:</b> Counting animals, measuring farm tools or animals, sorting, and identifying patterns in farming tasks.</li> <li>5. <b>Art:</b> Creating visual representations of farm life, drawing farm animals, and constructing models of farm scenes.</li> <li>6. <b>Music:</b> Singing farm-related songs, mimicking animal sounds, and exploring rhythm through farm themes.</li> </ol> <p>These interdisciplinary connections allow students to see the relevance of farm life across multiple domains, deepening their understanding of the content while fostering skills in various subject areas. The hands-on nature of the activities ensures that students engage both creatively and analytically with the topic.</p>	<p>Some misconceptions students may have in this unit include:</p> <ul style="list-style-type: none"> <li>● All animals on the farm are the same.</li> <li>● Farm animals can live without care.</li> <li>● Plants grow quickly just like in stories.</li> <li>● Farms only produce food.</li> <li>● Farmers only work during harvest season.</li> <li>● Crops grow on a farm without any special care or attention.</li> <li>● All food comes from the grocery store</li> <li>● Farm life is easy and fun all the time.</li> <li>● Animals can only be kept on farms.</li> <li>● The roles on the farm only involve taking care of animals..</li> </ul>
<p><b>Connections to Prior Units:</b></p>	<p><b>Connections to Future Units:</b></p>
<p>The <i>"Once Upon a Farm"</i> module builds on the foundational concepts developed in the <i>Five Senses</i> unit by offering students opportunities to explore the farm environment using their senses in real-world contexts. Students apply their sensory skills to observe animals, plants, and the farm ecosystem, deepening their understanding of how their senses help them learn about and interact with the world around them. By making these connections, students can reinforce both scientific concepts and social-emotional skills while developing a deeper appreciation for the sensory-rich experiences on a farm.</p>	<p>The connection between <i>"Once Upon a Farm"</i> and <i>"America Then and Now"</i> lies in their shared focus on community, work, and how life in the past and present shapes the lives of people. Both modules provide students with foundational knowledge about farming, work roles, and economic contributions while introducing the idea of change over time. The second module helps students see farming as part of the larger story of America's growth, encouraging them to think about how past practices influence the present and future. Through these connections, students gain a deeper understanding of the ways in which history, culture, and technology intersect with daily life, fostering an appreciation for both the continuity and change in the world around them.</p>
<p><b>Differentiation through <i>Universal Design for Learning</i></b></p>	

UDL Indicator	Teacher Actions:
<p><b>7. Perception</b></p> <p><b>8. Language and Symbols</b></p> <p><b>9. Building Knowledge</b></p> <p><b>10. Interaction</b></p> <p><b>11. Expression &amp; Community</b></p> <p><b>12. Strategy Development</b></p> <p><b>13. Welcoming Interests &amp; Identities</b></p> <p><b>14. Sustaining Effort &amp; Persistence</b></p> <p><b>15. Emotional Capacity</b></p>	<ul style="list-style-type: none"> <li>● Support opportunities to customize the display of information (1.1)</li> <li>● Support multiple ways to perceive information (1.2)</li> <li>● Represent a diversity of perspectives and identities in authentic ways. (1.3)</li> <li>● Clarify vocabulary, symbols, and language structures (2.1)</li> <li>● Illustrate through multiple media (2.5)</li> <li>● Connect prior knowledge to new learning (3.1)</li> <li>● Highlight and explore patterns, critical features, big ideas, and relationships (3.2)</li> <li>● Maximize transfer and generalization (3.4)</li> <li>● Vary and honor the methods for response, navigation, and movement. (4.1)</li> <li>● Optimize access to accessible materials and assistive and accessible technology and tools.</li> <li>● Use multiple tools for construction, composition, and creativity (5.2)</li> <li>● Build fluencies with graduated support for practice and performance (5.3)</li> <li>● Organize information and resources (6.3)</li> <li>● Optimize choice and autonomy (7.1)</li> <li>● Optimize challenge and support (8.2)</li> <li>● Foster collaboration, interdependence, and collective learning (8.3)</li> <li>● Foster belonging and community (8.4)</li> <li>● Offer action-oriented feedback (8.5)</li> <li>● Recognize expectations, beliefs, and motivations (9.1)</li> <li>● Develop awareness of self and others (9.2)</li> </ul>
<b>Supporting Multilingual/English Learners</b>	
Related <b>CELP standards:</b>	<b>Learning Targets:</b>






<p>An EL with guidance and supports, can participate in short discussions, conversations, and short written exchanges using words and phrases acquired in conversations, reading, and being read to.</p>	<ul style="list-style-type: none"> <li>I can explain what makes a good story</li> </ul>	
Lesson Sequence	Learning Target/ Success Criteria/ Assessment	Resources
1	<p>LT: I can explain what makes a good story.</p> <p>SC: I asked questions about Three Little Pigs using question words.</p> <p>SC: I learned how to plan a sentence by telling who did what.</p>	<p> WW23_GK_M2_Projected_L01.p...</p>
2	<p>LT: I can explain what makes a good story.</p> <p>SC: I asked questions and shared my observation about the book Farm Animals.</p> <p>SC: I practiced speaking with a strong voice.</p>	<p> WW23_GK_M2_Projected_L02.p...</p>
3	<p>LT: I can explain what makes a good story.</p> <p>SC: I practiced retelling using key details.</p> <p>SC: I practiced reading fluently with a strong voice.</p> <p>SC: I planned a sentence by telling what each animal did.</p>	<p> WW23_GK_M2_Projected_L03.p...</p>
4	<p>LT: I can explain what makes a good story.</p> <p>SC: I learned information about the animals in the book by looking at the pictures.</p> <p>SC: I practiced reading fluently with a strong voice.</p> <p>SC: I used vocabulary words to plan a sentence.</p>	<p> WW23_GK_M2_Projected_L04.p...</p>
5	<p>LT: I can explain what makes a good story.</p> <p>SC: I created my animal fact card.</p> <p>SC: I identified the meaning of the text Farm Animals.</p> <p>SC: I used my alphabet strip to help me write words.</p>	<p> WW23_GK_M2_Projected_L05.p...</p>
6	<p>LT: I can explain what makes a good story.</p> <p>SC: I can tell what important information I learned in the book Farm Animals.</p>	<p> WW23_GK_M2_Projected_L06.p...</p>

	<p>SC: I practiced reading fluently with a strong voice.</p> <p>SC: I used my alphabet strip to help me write words.</p>	
7	<p>LT: I can explain what makes a good story.</p> <p>SC: I used words from the question cube to ask questions about The Year at Maple Hill Farm.</p> <p>SC: I wrote about a noticing I made about the farm in January.</p> <p>SC: I described the types of weather in the seasons.</p>	<p> WW23_GK_M2_Projected_L07.p...</p>
8	<p>LT: I can explain what makes a good story.</p> <p>SC: I practiced retelling using key details from the story.</p> <p>SC: I learned why it is important to expand sentences.</p> <p>SC: I used an alphabet strip to help me write words.</p>	<p> WW23_GK_M2_Projected_L08.p...</p>
9	<p>LT: I can explain what makes a good story.</p> <p>SC: I described key details throughout the story to describe the setting.</p> <p>SC: I used words to describe clothes worn in each season.</p>	<p> WW23_GK_M2_Projected_L09.p...</p>
10	<p>LT: I can explain what makes a good story.</p> <p>SC: I expanded sentences about life on Maple Hill Farm.</p> <p>SC: I used the illustrations and words to write about what happened on Maple Hill Farm.</p> <p>SC: I used an alphabet strip to help me write words.</p> <p>SC: I sang The Seasons Song.</p>	<p> WW23_GK_M2_Projected_L10.p...</p>
11	<p>LT: I can explain what makes a good story.</p> <p>SC: I used the words and illustrations in the story to determine the text's essential meaning.</p> <p>SC: I learned why settings are important to a story.</p> <p>SC: I learned how to plan a sentence by telling who did what and added when.</p>	<p> WW23_GK_M2_Projected_L11.pp...</p>
12	<p>LT: I can explain what makes a good story.</p>	<p> WW23_GK_M2_Projected_L12.p...</p>



	<p>SC: I showed my understanding of the setting by telling what was happening on the farm in one season.</p> <p>SC: I sang the song for fluency.</p> <p>SC: I wrote a sentence about the season using where and when.</p>	
13	<p>LT: I can explain what makes a good story.</p> <p>SC: I identified the characters in the story.</p> <p>SC: I acted out the character traits of the three little pigs</p> <p>SC: I drew and labeled a picture of one of the characters.</p>	P WW23_GK_M2_Projected_L13.p...
14	<p>LT: I can explain what makes a good story.</p> <p>SC: I illustrated a setting in The Three Little Pigs.</p> <p>SC: I described the mother in The Three Little Pigs.</p> <p>SC: I used a tool to help me spell my words.</p>	P WW23_GK_M2_Projected_L14.p...
15	<p>LT: I can explain what makes a good story.</p> <p>SC: I described the characters in Three Little Pigs using adjectives and text evidence.</p> <p>SC: I described a character in American Gothic.</p> <p>SC: I acted out the vocabulary words to show my understanding of their meaning.</p>	P WW23_GK_M2_Projected_L15.p...
16	<p>LT: I can explain what makes a good story.</p> <p>SC: I determined the essential meaning of the story.</p> <p>SC: I compared and contrasted two pigs in the story.</p> <p>SC: I used my tools to help me write my high frequency words.</p>	P WW23_GK_M2_Projected_L16.p...
17	<p>LT: I can explain what makes a good story.</p> <p>SC: I wrote a sentence using a character trait to describe a character from the story and drew a picture.</p> <p>SC: I added a sentence telling what the character did that showed the trait.</p> <p>SC: I identify the difference between hearing and</p>	P WW23_GK_M2_Projected_L17.p...

	<p>listening.</p> <p>SC: I used my tools to help me write my high frequency words.</p>	
18	<p>LT: I can explain what makes a good story.</p> <p>SC: I discussed the problem and resolution in the Three Little Pigs.</p> <p>SC: I identified the characters and setting in The Little Red hen.</p> <p>SC: I wrote and drew to show what I noticed in the text.</p> <p>SC: I used question words to ask questions about The Little Red Hen.</p> <p>SC: I learned new meanings for familiar words.</p>	P WW23_GK_M2_Projected_L18.p...
19	<p>LT: I can explain what makes a good story.</p> <p>SC: I described what I learned about the characters in <i>The Little Red Hen</i>.</p> <p>SC: I wrote about the characters and setting in my own story.</p> <p>SC: I acted out the vocabulary words to show my understanding of their meaning.</p>	P WW23_GK_M2_Projected_L19.p...
20	<p>LT: I can explain what makes a good story.</p> <p>SC: I identified the problem and resolution in <i>The Little Red Hen</i>.</p> <p>SC: I wrote about a problem in my own story.</p> <p>SC: I explained how adding -s to words can help me figure out the meaning of words.</p>	P WW23_GK_M2_Projected_L20.p...
21	<p>LT: I can explain what makes a good story.</p> <p>SC: I explained why the repeated language in the story <i>The Little Red Hen</i> is important.</p> <p>SC: I wrote about an event in our class book.</p> <p>SC: I added content and frequently occurring words to my writing.</p>	P WW23_GK_M2_Projected_L21.p...
22	<p>LT: I can explain what makes a good story.</p>	P WW23_GK_M2_Projected_L22.p...

	<p>SC: I explained the essential meaning of <i>The Little Red Hen</i>.</p> <p>SC: I wrote a new problem and solution for the character in <i>The Little Red Hen</i>.</p>	
23	<p>LT: I can explain what makes a good story.</p> <p>SC: I compared characters from <i>The Little Red Hen</i> and <i>Three Little Pigs</i>.</p> <p>SC: I wrote a new problem and solution for the character in <i>The Little Red Hen</i>.</p> <p>SC: I added content and frequently occurring words to my writing.</p>	P WW23_GK_M2_Projected_L23.p...
24	<p>LT: I can explain what makes a good story.</p> <p>SC: I explained the story elements of <i>The Three Billy Goats Gruff</i>.</p> <p>SC: I identified and sorted story elements correctly.</p>	P WW23_GK_M2_Projected_L24.p...
25	<p>LT: I can explain what makes a good story.</p> <p>SC: I explained the importance of the main problem in <i>Three Billy Goats Gruff</i>.</p> <p>SC: I explained the importance of multiple attempts to solve a problem throughout the story.</p>	P WW23_GK_M2_Projected_L25.p...
26	<p>LT: I can explain what makes a good story.</p> <p>SC: I explained the importance of the order of events in a story.</p> <p>SC: I wrote a solution to a story's problem.</p> <p>SC: I explained my understanding of adjectives about size.</p>	P WW23_GK_M2_Projected_L26.p...
27.	<p>LT: I can explain what makes a good story.</p> <p>SC: I determined the essential meaning of the story <i>The Three Billy Goats Gruff</i> using events from the story.</p> <p>SC: I expressed an understanding of sequencing events in a story by adding two events to the class narrative.</p>	P WW23_GK_M2_Projected_L27.p...

28.	<p>LT: I can explain what makes a good story.</p> <p>SC: I expressed my understanding of sequencing events in a story.</p> <p>SC: I added content and frequently occurring words to my writing.</p>	 WW23_GK_M2_Projected_L28.p...
29.	<p>LT: I can explain what makes a good story.</p> <p>SC: I collaborated in conversation to synthesize information.</p> <p>SC: I identified and sorted story elements correctly.</p>	 WW23_GK_M2_Projected_L29.p...
30.	<p>LT: I can explain what makes a good story.</p> <p>SC: I demonstrated understanding of how to create a good story.</p> <p>SC: I demonstrated understanding of grade-level vocabulary.</p>	 WW23_GK_M2_Projected_L30.p...
31.	<p>LT: I can explain what makes a good story.</p> <p>SC: I expressed my understanding of how to create a good story.</p> <p>SC: I evaluated writing and used complete sentences to share my reflections.</p>	 WW23_GK_M2_Projected_L31.p...
32.	<p>LT: I can explain what makes a good story.</p> <p>SC: I expressed my understanding of how to create a good story.</p> <p>SC: I evaluated writing and used complete sentences to share my reflections.</p>	 WW23_GK_M2_Projected_L32.p...

<b>Unit Title:</b>	
<b>Module 3 America Then and Now</b>	
<b>Relevant Standards: Bold indicates priority</b>	
Content Standards: See Above	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
How has life in America changed over time?	Students in Kindergarten will understand the following concepts as a result of this module:

	<ul style="list-style-type: none"> <li>• People and things change over time.</li> <li>• History helps us understand how people lived in the past.</li> <li>• Communities and traditions connect us to the past.</li> <li>• Technology and tools change over time, influencing how people live.</li> <li>• Comparing life “then” and “now” helps us understand how things have changed.</li> <li>• Symbols and celebrations help us remember and honor important parts of American history.</li> </ul>															
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>															
<p>Students may demonstrate their learning within this unit in a variety of ways. Possible methods for this include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Reading</li> <li>• Writing</li> <li>• Speaking</li> <li>• Listening</li> <li>• Analyzing text</li> <li>• Using evidence</li> <li>• Engaging in discussions</li> </ul>	8 weeks															
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>															
<p> WW_GK_M3_FamilyTipSheet_English.pdf</p> <p> February Kindergarten Family Memo</p>	<p>Songs</p> <ul style="list-style-type: none"> <li>• “Engine on the Track” (nursery rhyme)</li> <li>• “This Land Is Your Land,” Woody Guthrie</li> <li>• “You’re a Grand Old Flag,” George M. Cohan</li> </ul> <p>Video</p> <ul style="list-style-type: none"> <li>• “Sounds of a Glass Armonica,” <i>Toronto Star</i></li> </ul>															
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>															
<p><b>Academic Vocabulary</b></p> <table border="1"> <tr> <td>photographs</td> <td>when</td> <td>Close up</td> </tr> <tr> <td>background</td> <td>enough</td> <td>change</td> </tr> <tr> <td>wave</td> <td>forever</td> <td>plural</td> </tr> <tr> <td>American Flag</td> <td>event</td> <td>echo</td> </tr> <tr> <td>Topic statement</td> <td>Long ago</td> <td>now</td> </tr> </table>	photographs	when	Close up	background	enough	change	wave	forever	plural	American Flag	event	echo	Topic statement	Long ago	now	<p>Picture Books (Informational)</p> <ul style="list-style-type: none"> <li>• Communication Then and Now, Robin Nelson</li> <li>• Home Then and Now, Robin Nelson</li> <li>• Now &amp; Ben: The Modern Inventions of Benjamin Franklin, Gene Barretta</li> <li>• School Then and Now, Robin Nelson</li> <li>• Transportation Then and Now, Robin Nelson</li> <li>• When I Was Young in the Mountains, Cynthia Rylant</li> <li>• Picture Books (Literary)</li> </ul>
photographs	when	Close up														
background	enough	change														
wave	forever	plural														
American Flag	event	echo														
Topic statement	Long ago	now														

retell	then	Map
Illustration	glossary	Punctuation
Order	Old	clean
Dirty	young	Fill
awake	Long ago	Now
Then	retell	Glossary

**Content Vocabulary**

Swimming hole	American Flag	Bifocal lens
measure	odometer	device
distance	postal	routes
sanitation	voyage	Grand emblem
City scene	Country scene	Burst
transportation	communication	Inventions
Little house		

- The Little House, Virginia Lee Burton
- Painting
- Washington Crossing the Delaware, Emanuel Leutze
- Photographs
- “Betsy Ross and the American Flag: Flag Picture Gallery,” Independence Hall Association
  - Old Hand Water Pump, Judson McCranie
  - “Then & Now: The Stunning Speed of Urban Development,” S.A. Rogers
- Poem
- “Now We Are Six,” A.A. Milne
- Songs
- “Engine on the Track” (nursery rhyme)
  - “This Land Is Your Land,” Woody Guthrie
  - “You’re a Grand Old Flag,” George M. Cohan
- Video
- “Sounds of a Glass Armonica,” Toronto Star

**Opportunities for Interdisciplinary Connections:**






- **Social Studies:** Understanding historical changes, geography, and the role of communities.
- **Language Arts:** Reading, writing, and vocabulary development related to history and technology.
- **Art:** Visual representations of historical life and changes in society.
- **Mathematics:** Time, sequencing, counting, and graphing historical data.
- **Science:** Technology and environmental changes, inventions, and exploration of how they have shaped daily life.
- **Music:** Exploring historical and cultural songs to understand the role of music in history.








**Anticipated misconceptions:**







- The concept of time: Students may not fully grasp the concept of “then” and “now.”
- Students may have trouble understanding the difference between fictional characters and historical figures.
- Students may believe that all technology, such as modern tools, has always existed.
- Students may have a narrow view of American history, focusing only on well-known events or figures.
- Students may think that certain traditions or celebrations have always been celebrated in the same way.
- Students may believe that things in the past were only “old-fashioned” and that everything today is better or more advanced.
- Students may believe that everyone in the past had the same roles or jobs.






<p>By connecting "<b>America Then and Now</b>" with these other subject areas, students get a more holistic and enriching learning experience that supports their understanding of history while engaging multiple learning pathways. This interdisciplinary approach helps students see the connections between different areas of knowledge and better understand how the past has shaped the present.</p>	<ul style="list-style-type: none"> <li>• Students may not understand the difference between historical artifacts and everyday objects they see today.</li> <li>• Students may not understand the significance of national symbols like the flag or bald eagle.</li> </ul>
<p><b>Connections to Prior Units:</b></p>	<p><b>Connections to Future Units:</b></p>
<ul style="list-style-type: none"> <li>• Senses as a Lens for Understanding Change: The exploration of senses in Module 1 provides a foundation for comparing how sensory experiences have changed over time, particularly when discussing life on the farm in Module 2 and how rural and urban settings have evolved in Module 3.</li> <li>• Historical Context of Work: Module 2 introduces students to farm life, which can be compared in Module 3 to modern farming practices and urban life, highlighting changes in work and technology.</li> <li>• Community Life and Traditions: Module 2's exploration of farming communities connects to Module 3 by comparing rural and urban communities across time.</li> <li>• Technology's Role in Change: The comparison of farming tools and practices in Module 2 with modern technologies in Module 3 helps students understand technological advancement as a key part of historical change.</li> </ul> <p>By drawing on sensory experiences, community life, and technological changes, students can deepen their understanding of how America has evolved from the past to the present. These connections allow students to see the continuity and change in their environment, giving them a well-rounded view of history and progress.</p>	<ul style="list-style-type: none"> <li>• America's Geographic Position: Students learn how the United States fits within North America, and how geography has played a role in the country's development.</li> <li>• Historical Change and Global Context: Students compare historical changes in America to changes across other continents, broadening their understanding of historical development globally.</li> <li>• Geography's Role in History: The geography of America influenced its historical developments, and students can compare this with how other continents were shaped by their geography and people's needs.</li> <li>• Cultural Comparisons: By learning about America's evolution and comparing it to other continents, students can understand the role of culture, community, and environment in shaping societies around the world.</li> <li>• Global Influence: Students explore how American history has influenced, and been influenced by, other continents, whether through trade, technology, or migration.</li> <li>• Mapping and Spatial Awareness: Learning about maps and continents helps students understand the spatial context for historical events in America.</li> <li>• These connections help students see the broader world around them and understand that the history of America is intertwined with geography, culture, and history on a global scale. By making these connections, students gain a deeper understanding of</li> </ul>







	both America Then and Now and the concept of Continents.
<b>Differentiation through <i>Universal Design for Learning</i></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<p><b>1. Perception</b></p> <p><b>2. Language and Symbols</b></p> <p><b>3. Building Knowledge</b></p> <p><b>4. Interaction</b></p> <p><b>5. Expression &amp; Community</b></p> <p><b>6. Strategy Development</b></p> <p><b>7. Welcoming Interests &amp; Identities</b></p> <p><b>8. Sustaining Effort &amp; Persistence</b></p>	<ul style="list-style-type: none"> <li>● Support opportunities to customize the display of information (1.1)</li> <li>● Support multiple ways to perceive information (1.2)</li> <li>● Represent a diversity of perspectives and identities in authentic ways. (1.3)</li> <li>● Clarify vocabulary, symbols, and language structures (2.1)</li> <li>● Illustrate through multiple media (2.5)</li> <li>● Connect prior knowledge to new learning (3.1)</li> <li>● Highlight and explore patterns, critical features, big ideas, and relationships (3.2)</li> <li>● Maximize transfer and generalization (3.4)</li> <li>● Vary and honor the methods for response, navigation, and movement. (4.1)</li> <li>● Optimize access to accessible materials and assistive and accessible technology and tools.</li> <li>● Use multiple tools for construction, composition, and creativity (5.2)</li> <li>● Build fluencies with graduated support for practice and performance (5.3)</li> <li>● Organize information and resources (6.3)</li> <li>● Optimize choice and autonomy (7.1)</li> <li>● Optimize challenge and support (8.2)</li> <li>● Foster collaboration, interdependence, and collective learning (8.3)</li> <li>● Foster belonging and community (8.4)</li> <li>● Offer action-oriented feedback (8.5)</li> </ul>



<p><b>9. Emotional Capacity</b></p>	<ul style="list-style-type: none"> <li>Recognize expectations, beliefs, and motivations (9.1)</li> <li>Develop awareness of self and others (9.2)</li> </ul>	
<p><b>Supporting Multilingual/English Learners</b></p>		
<p><b>Related CELP standards:</b></p>	<p><b>Learning Targets:</b></p>	
<p>An EL with guidance and supports, can participate in short discussions, conversations, and short written exchanges using words and phrases acquired in conversations, reading, and being read to.</p>	<p>I can describe how life in America has changed over time.</p>	
<p><b>Lesson Sequence</b></p>	<p><b>Learning Target / Success Criteria/Assessment</b></p>	<p><b>Resources</b></p>
<p>1</p>	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used question words to ask questions about the text <i>School Then and Now</i>.</p> <p>SC: I showed my thinking through writing and drawing.</p>	<p> WW23_GK_M3_Projected_L01.p...</p>
<p>2</p>	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used question words to ask questions about the text <i>When I was Young in the Mountains</i>.</p> <p>SC: I described the role of the author and illustrator and how they add to the story.</p>	<p> WW23_GK_M3_Projected_L02.p...</p>
<p>3</p>	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I identified the main topic and key details in the text <i>When I was Young in the Mountains</i>.</p> <p>SC: I acted out opposite words.</p>	<p> WW23_GK_M3_Projected_L03.p...</p>
<p>4</p>	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I shared evidence of the key details in the text <i>When I was Young in the Mountains</i>.</p> <p>SC: I discussed a special memory from the past.</p>	<p> WW23_GK_M3_Projected_L04.p...</p>
<p>5</p>	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used words and illustrations to determine the author's message in the text <i>When I was Young in the Mountains</i>.</p>	<p> WW23_GK_M3_Projected_L05.p...</p>

	<p>SC: I compared the author's life in the past to my life now using evidence from the text <i>When I was Young in the Mountains</i>.</p> <p>SC: I used a capital letter I in my written response.</p>	
6	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I compared the author's life in the past to my life now using evidence from the text <i>When I was Young in the Mountains</i>.</p>	 WW23_GK_M3_Projected_L06.p...
7	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used question words to ask questions about the text <i>Home Then and Now</i>.</p> <p>SC: I capitalized the first word in my sentence.</p>	 WW23_GK_M3_Projected_L07.p...
8	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I identified the main topic and key details in the text <i>Home Then and Now</i>.</p> <p>SC: I showed my understanding by sorting nonfiction texts between home and school</p>	 WW23_GK_M3_Projected_L08.p...
9	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I identified the main topic and key details in the text <i>Home Then and Now</i>.</p> <p>SC: I wrote about how life at home has changed over time.</p>	 WW23_GK_M3_Projected_L09.p...
10	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I made connections between the photographs in <i>School Then and Now</i> and <i>Home Then and Now</i>.</p> <p>SC: I wrote how school in America has changed over time.</p>	 WW23_GK_M3_Projected_L10.p...
11	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I shared my understanding of how school and home has changed in America over time.</p>	 WW23_GK_M3_Projected_L11.p...
12	<p>LT: I can describe how life in America has changed over</p>	 WW23_GK_M3_Projected_L12.p...

	<p>time.</p> <p>SC: I asked and answered questions about <i>The Little House</i>.</p> <p>SC: I can act out and use vocabulary from the text.</p>	
13	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I described the setting of <i>The Little House</i> and how it changed throughout the story.</p>	 WW23_GK_M3_Projected_L13.p...
14	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I retold the story of <i>The Little House</i> using key details.</p> <p>SC: I worked with others to create a topic statement.</p> <p>SC: I acted out words to understand their meaning.</p>	 WW23_GK_M3_Projected_L14.p...
15	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I explained how the main character responded to the changes around her using details and illustrations from the text.</p> <p>SC: I identified evidence that supports my topic statement.</p>	 WW23_GK_M3_Projected_L15.p...
16	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used words and illustrations to determine the author's message in the text <i>The Little House</i>.</p> <p>SC: I described changes the main character sees in her neighborhood.</p>	 WW23_GK_M3_Projected_L16.p...
17	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used evidence from the text to write about the changes the main character sees in her neighborhood.</p> <p>SC: I asked and answered questions about <i>The Little House</i> in a discussion.</p>	 WW23_GK_M3_Projected_L17.p...
18	<p>LT: I can describe how life in America has changed over</p>	 WW23_GK_M3_Projected_L18.p...

	<p>time.</p> <p>SC: I used question words to ask questions about the text <i>Transportation Then and Now</i></p> <p>SC: I recognized and named punctuation marks.</p>	
19	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I identified the main topic and key details in the text <i>Then and Now</i>.</p> <p>SC: I examined the importance of writing a conclusion sentence in a paragraph.</p>	 WW23_GK_M3_Projected_L19.p...
20	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I made connections between related photographs in the text.</p>	 WW23_GK_M3_Projected_L20.p...
21	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I demonstrated understanding of how <i>Transportation and Communication Then and Now</i> builds knowledge of change in America.</p>	 WW23_GK_M3_Projected_L21.p...
22	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I asked and answered questions about the words and pictures in <i>Now &amp; Ben</i>.</p>	 WW23_GK_M3_Projected_L22.p...
23	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I identified the main topic and key details in <i>Now &amp; Ben</i>.</p> <p>SC: I described how illustrations add more detail to informative writing.</p>	 WW23_GK_M3_Projected_L23.p...
24	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used words and illustration in <i>Now &amp; Ben</i> to learn more about his inventions.</p> <p>SC: I used drawings to add more details to my writing about inventions.</p>	 WW23_GK_M3_Projected_L24.p...

25	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used words and illustrations in the text to determine the essential meaning of <i>Now &amp; Ben</i>.</p> <p>SC: I described how Benjamin Franklin's inventions are used in America today through informative writing.</p>	<p> WW23_GK_M3_Projected_L25.p...</p>
26	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I expressed my understanding of how <i>Now &amp; Ben</i> builds knowledge of change in America.</p> <p>SC: I described how Benjamin Franklin's inventions are used in America today through informative writing.</p>	<p> WW23_GK_M3_Projected_L26.p...</p>
27	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I used drawings to support and enhance a group conversation.</p>	<p> WW23_GK_M3_Projected_L27.p...</p>
28	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I expressed my understanding of how life in America has changed over time.</p> <p>SC: I demonstrated understanding of grade-level vocabulary.</p>	<p> WW23_GK_M3_Projected_L28.p...</p>
29	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I expressed my understanding of how life in America has changed over time.</p> <p>SC: I elevated my writing and used sentences to share reflections.</p>	<p> WW23_GK_M3_Projected_L29.p...</p>
30	<p>LT: I can describe how life in America has changed over time.</p> <p>SC: I expressed my understanding of how life has changed over time.</p> <p>SC: I elevated my writing and used sentences to share reflections.</p>	<p> WW23_GK_M3_Projected_L30.p...</p>

<b>Unit Title:</b>	
<b>Module 4 The Continents</b>	
<b>Relevant Standards: Bold indicates priority</b>	
Content Standards: See Above	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
What makes the world fascinating?	<p>Students in Kindergarten will understand the following concepts as a result of this module:</p> <ul style="list-style-type: none"> <li>• The world is a large place with diverse people and places.</li> <li>• Each continent is characterized by its own animals, natural features, and things to do.</li> <li>• Maps and photographs can visually transport viewers to different locations around the world.</li> <li>• Stories can transport readers to another place through language and illustrations.</li> <li>• Collecting and reflecting upon information allows a person to make and support an informed opinion with reasons.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<p>Students may demonstrate their learning within this unit in a variety of ways. Possible methods for this include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Reading</li> <li>• Writing</li> <li>• Speaking</li> <li>• Listening</li> <li>• Analyzing text</li> <li>• Using evidence</li> <li>• Engaging in discussions</li> </ul>	8 weeks
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<p> <a href="#">WW_GK_M4_FamilyTipSheet_English.pdf</a></p> <p> <a href="#">April Kindergarten Family Memo</a></p>	<p>Songs</p> <ul style="list-style-type: none"> <li>• “Penguin Song,” <i>Preschool Education</i></li> <li>• “Where in the World is Carmen Sandiego? from Smithsonian Folkways,” <i>Smithsonian Folkways Recordings</i></li> </ul> <p>Videos</p> <ul style="list-style-type: none"> <li>• “Antarctic Sights and Sounds,” James Napoli</li> </ul>

	<ul style="list-style-type: none"> <li>• “Burkina Faso: Music,” <i>Our Africa</i></li> <li>• “Explore Views of the Burj Khalifa with Google Maps,” Google Maps</li> <li>• “The Seven Continents Song,” Silly School</li> </ul> <p>Songs</p> <ul style="list-style-type: none"> <li>• “Storm-Proofing the World’s Biggest Mud Building,” BBC Earth</li> <li>• “Traditional Chinese Dance—‘Flowers Contend in Beauty,’” by Li Qian, Lin Chen</li> </ul> <p>Web Pages</p> <ul style="list-style-type: none"> <li>• “Americas—Fact Files,” <i>Go Wild</i></li> <li>• “Moles,” <i>DK Find Out!</i></li> </ul>
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<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
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**Academic Vocabulary**

world	map	oceans
land	fascinating	north
south	opinion	opposite
east	west	topic
details	heading	modern
marvel	interesting	language
custom	stick	horns
enough	point	touch
poke	feature	few
action	giant	thick
blow	swirl	flow
amazing	describing	proud
bobbing	bear	lumber
slide	glide	crawl
mischief	fetch	timid
respond	compliment	scurried

Picture Books (Informational)

- *Africa*, Rebecca Hirsch
- *Antarctica*, Rebecca Hirsch
- *Asia*, Rebecca Hirsch
- *Australia*, Rebecca Hirsch
- *Europe*, Rebecca Hirsch
- *Introducing North America*, Chris Oxladethr
- *South America*, Rebecca Hirsch
- *World Atlas*, Nick Crane; Illustrations, David Dean

Picture Books (Literary)

- *Moon Rope*, Lois Ehlert
- *The Story of Ferdinand*, Munro Leaf; Illustrations, Robert Lawson
- *Why Mosquitoes Buzz in People’s Ears: A West African Tale*, Verna Aardema; Illustrations, Leo and Diane Dillon

Article

- “5 Reasons Why Animal Moms Are Awesome,” April Capochino Myers

Paintings

- *Carta Marina*, Olaus Magnus
- *Cornell Farm*, Edward Hicks
- *Washington Crossing the Delaware*, Emanuel Leutze

Photographs

leap	creep	heap
slithering	imaginary	uncertainly
unkind	unwilling	snap
mind	unusual	uneven
uncommon	table of contents	hitch
hang		
visit	introduce	quote
quotation	flat	

### Content Vocabulary

continents	Asia	Europe
spherical	monsoon	North America
South America	Africa	Australia
Antarctica	dunes	mountain
Natural feature	atlas	transport
cartographer	folktale	scale
Origin story	island	add
Coral reef	caption	pouch
waterfall	restate	culture
shadow		

- *Earth from Space*, Stöckli, Reto, et al.
- “Grand Canyon Scenic Splendor,” *National Park Service*
- “Patterns of Chinchero,” *Descendants of the Incas*

### Picture Books (Informational)

- *When I Was Young in the Mountains*, Cynthia Rylant; Illustrations, Diane Goode
- Poem
- “Lions Roar” (Repeated Language Chart)
- Quotation
- “What is life?” Crowfoot

### Opportunities for Interdisciplinary Connections:

1. **Social Studies:** Understanding global geography, cultural diversity, and the role of geography in shaping human life.
2. **Language Arts:** Vocabulary development, reading, writing, and storytelling related to the continents.
3. **Science:** Learning about animal habitats, climate, weather, and adaptations across different continents.
4. **Mathematics:** Counting, sorting, graphing, and

### Anticipated misconceptions:

- All continents are similar in size and shape
- All countries and cultures on a continent are the same.
- All continents have the same climate or weather.
- People from other continents live in exactly the same way as people in their own country.
- Antarctica is a continent where people live.
- There is only one climate on each continent
- Continents are unchangeable and have

<p>measuring related to geographical features, animal populations, and continent size.</p> <p>5. <b>Art:</b> Creating maps, flags, and cultural art projects inspired by different regions of the world.</p> <p>6. <b>Music:</b> Exploring traditional music, rhythms, and instruments from different continents.</p> <p>By incorporating these interdisciplinary connections, students can build a richer and more holistic understanding of the world while enhancing their skills in multiple subject areas. The "<b>Continents</b>" module encourages curiosity about the world, fosters appreciation for cultural diversity, and provides a global perspective on the interconnections between geography, culture, science, and the arts.</p>	<p>always been the same.</p> <ul style="list-style-type: none"> <li>• The continents are the same distance apart from each other.</li> <li>• People live in every part of each continent.</li> <li>• All people on a continent speak the same language.</li> </ul>
<p><b>Connections to Prior Units:</b></p>	<p><b>Connections to Future Units:</b></p>
<p>In Module 4, "The Continents," students have an opportunity to build upon their learning from previous modules in a way that deepens their understanding of the world. Connections to Module 1 (The Five Senses), Module 2 (Life on the Farm), and Module 3 (America Then and Now) help students explore the diversity of the world's continents, the impact of environment on lifestyle, and how cultures and histories shape the way people live today. Through these connections, students can develop a more comprehensive understanding of the world around them and grow in their social-emotional awareness and empathy for others.</p>	<p>Module 4, "The Continents," serves as a foundation for future units in Wit &amp; Wisdom offering students a broad understanding of the world. It sets the stage for exploration of topics like weather, animals, communities, landmarks, transportation, and space, all of which will build on their growing knowledge of geography, cultural diversity, and the interconnectivity of the world. By making these connections, students can see how learning about the continents not only helps them understand where they live but also prepares them for deeper exploration of the world around them.</p> <p>Wit &amp; Wisdom Kindergarten Module 4: The Continents establishes a strong foundation for future learning in Grade 1 by helping students develop:</p> <ul style="list-style-type: none"> <li>• Basic geographical knowledge (continents, climates, environments)</li> <li>• Awareness of cultural diversity and different ways of life</li> <li>• An understanding of the world as an interconnected place</li> <li>• Inquiry skills for exploration and problem-solving</li> </ul> <p>By the time students reach Grade 1, they will be prepared to delve into more detailed studies of geography, history, and social studies, using the</p>

broad concepts introduced in Kindergarten as a springboard for deeper exploration.

**Differentiation through *Universal Design for Learning***

**UDL Indicator**

**Teacher Actions:**

**1. Perception**

- Support opportunities to customize the display of information (1.1)
- Support multiple ways to perceive information (1.2)
- Represent a diversity of perspectives and identities in authentic ways. (1.3)

**2. Language and Symbols**

- Clarify vocabulary, symbols, and language structures (2.1)
- Illustrate through multiple media (2.5)

**3. Building Knowledge**

- Connect prior knowledge to new learning (3.1)
- Highlight and explore patterns, critical features, big ideas, and relationships (3.2)
- Maximize transfer and generalization (3.4)

**4. Interaction**

- Vary and honor the methods for response, navigation, and movement. (4.1)
- Optimize access to accessible materials and assistive and accessible technology and tools.

**5. Expression & Community**

- Use multiple tools for construction, composition, and creativity (5.2)
- Build fluencies with graduated support for practice and performance (5.3)

**6. Strategy Development**





- Organize information and resources (6.3)

**7. Welcoming Interests & Identities**

- Optimize choice and autonomy (7.1)







**8. Sustaining Effort & Persistence**

- Optimize challenge and support (8.2)
- Foster collaboration, interdependence, and collective learning (8.3)
- Foster belonging and community (8.4)
- Offer action-oriented feedback (8.5)

<p><b>9. Emotional Capacity</b></p>	<ul style="list-style-type: none"> <li>Recognize expectations, beliefs, and motivations (9.1)</li> <li>Develop awareness of self and others (9.2)</li> </ul>	
<p><b>Supporting Multilingual/English Learners</b></p>		
<p><b>Related CELP standards:</b></p>	<p><b>Learning Targets:</b></p>	
<p>An EL with guidance and supports, can participate in short discussions, conversations, and short written exchanges using words and phrases acquired in conversations, reading, and being read to.</p>	<p>I can explain what makes the world fascinating.</p>	
<p><b>Lesson Sequence</b></p>	<p><b>Learning Target/ Success Criteria/Assessment</b></p>	<p><b>Resources</b></p>
<p>1</p>	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used different question words to ask questions about <i>Asia</i>.</p> <p>SC: I wrote about what I learned today.</p> <p>SC: I sorted land and water items into the categories: <i>continent</i> and <i>ocean</i>.</p>	<p> WW23_GK_M4_Projected_...</p>
<p>2</p>	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used text features to identify the main topic and details in the book <i>Asia</i>.</p> <p>SC: I wrote a sentence stating my opinion.</p> <p>SC: I explained common adjectives using their opposites.</p>	<p> WW23_GK_M4_Projected_...</p>
<p>3</p>	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used text features to identify the main topic and details in the book <i>Europe</i>.</p> <p>SC: I identified unknown words in <i>The Story of Ferdinand</i>.</p> <p>SC: I explained my understanding of words by saying them and acting them out.</p>	<p> WW23_GK_M4_Projected_...</p>
<p>4</p>	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used photographs and details from the text to describe things people can do in <i>Asia</i>.</p> <p>SC: I formed an opinion using the illustrations and words from the</p>	<p> WW23_GK_M4_Projected_...</p>







	<p>text.</p> <p>SC: I identified the parts of a sentence.</p> <p>SC: I described how a sentence was expanded.</p>	
5	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used photographs and details from the text to describe things people can do in Europe.</p> <p>SC: I described the events in the story <i>The Story of Ferdinand</i> using its illustrations and details.</p> <p>SC: I explained new meanings of words and used them correctly.</p>	P WW23_GK_M4_Projected_...
6	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I identified the reasons the author used to make a point in <i>Asia</i>.</p> <p>SC: I formed an opinion using the picture and words from the text.</p> <p>SC: I acted out the vocabulary words to show my understanding of their meaning.</p>	P WW23_GK_M4_Projected_...
7	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I identified the reasons the author used to make a point in <i>Europe</i>.</p> <p>SC: I wrote an opinion using evidence from <i>Asia</i> and <i>Europe</i>.</p> <p>SC: I acted out the vocabulary words to show my understanding of their meaning.</p>	P WW23_GK_M4_Projected_...
8	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I shared important learning from <i>Asia</i> using evidence from the organizer and text.</p> <p>SC: I explained the similarities between <i>Europe</i> and <i>World Atlas</i>.</p> <p>SC: I created a sentence using a preposition.</p>	P WW23_GK_M4_Projected_...
9	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I showed my learning in my writing and drawing.</p> <p>SC: I used different question words to ask questions about <i>Africa</i>.</p> <p>SC: I explained common adjectives by matching them to their</p>	P WW23_GK_M4_Projected_...


	opposites.	
10	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used text features to identify the main topic and details in a section of the book <i>Africa</i>.</p> <p>SC: I explained common adjectives by matching them to their opposites.</p>	P WW23_GK_M4_Projected_...
11	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used photographs and details from the text to describe natural features in <i>Africa</i>.</p> <p>SC: I supported an opinion using the illustrations and words from the text.</p> <p>SC: I explained my understanding of words by acting out their opposites.</p>	P WW23_GK_M4_Projected_...
12	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used photographs and details from the text to describe natural features in <i>Antarctica</i>.</p> <p>SC: I supported an opinion using the illustrations and words from the text.</p> <p>SC: I explained the meaning of words by acting them out.</p>	P WW23_GK_M4_Projected_...
13	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I explained the reasons the author gives to support a point in <i>Africa</i>.</p> <p>SC: I provided reasons from the text to support the point, "African elephant moms are awesome!"</p> <p>SC: I added on to my sentences by adding describing words.</p>	P WW23_GK_M4_Projected_...
14	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I formed an opinion statement using text evidence from <i>Africa</i> and <i>Antarctica</i>.</p> <p>SC: I explained similarities and differences between <i>Africa</i> and <i>World Atlas</i>.</p> <p>SC: I used the meaning of the ending-ful to help me figure out the meaning of new describing words.</p>	P WW23_GK_M4_Projected_...


15	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I formed and supported an opinion using information from <i>Africa and Antarctica</i>.</p> <p>SC: I shared understanding of the text by answering questions during group discussions.</p> <p>SC: I used the meaning of the ending-less to help me figure out the meaning of new describing words.</p>	 WW23_GK_M4_Projected_...
16	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used familiar words in, <u>Why Mosquitoes Buzz in People's Ears</u>, to figure out new words</p> <p>SC: I used question words to ask questions about <i>Carta Marina</i>.</p> <p>SC: I used both meanings of the words <i>bear</i> and <i>lumber</i>.</p>	 WW23_GK_M4_Projected_...
17	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used illustrations from <i>Why Mosquitoes Buzz in People's Ears</i> to understand events in the story.</p> <p>SC: I followed agreed upon rules for discussion when sharing my writing with a peer.</p> <p>SC: I used the meaning of the prefix -re to help me figure out the meaning of unknown words.</p>	 WW23_GK_M4_Projected_...
18	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used context clues from words and illustrations to determine unknown words in <i>Why Mosquitoes Buzz in People's Ears</i></p> <p>SC: I gave feedback to my peers about their writing.</p> <p>SC: I demonstrated understanding of <i>lumbered</i>, <i>scurried</i>, <i>returned</i> and <i>left</i> by acting out their opposites.</p>	 WW23_GK_M4_Projected_...
19	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used the words and illustrations to describe the characters' actions.</p> <p>SC: I used illustrations to determine what is happening in one scene of the text.</p> <p>SC: I used the meaning of the prefix -un to help me figure out the meaning of unknown words.</p>	 WW23_GK_M4_Projected_...
20	<p>LT: I can explain what makes the world fascinating.</p>	 WW23_GK_M4_Projected_...

	<p>SC: I determine essential meanings of the text <i>Why Mosquitoes Buzz in People's Ears</i> .</p> <p>SC: I expressed understanding of the characters in <i>Why Mosquitoes Buzz in People's Ears</i> by writing an opinion piece about a favorite character.</p> <p>SC: I described the meanings of the words <i>snap</i> and <i>mind</i>.</p>	
21	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I expressed understanding of the characters in <i>Why Mosquitoes Buzz in People's Ears</i> by writing an opinion piece about a favorite character.</p> <p>SC: I figured out the different shades of meaning between verbs of movement.</p> <p>SC: I wrote a complete sentence and added to it by adding an adjective and preposition.</p>	P WW23_GK_M4_Projected_...
22	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I represented my learning through writing and drawing.</p> <p>SC: I used a variety of question words to ask and answer questions about <i>Australia</i>.</p> <p>SC: I used the meaning of the prefix -un as a clue to help me figure out the meaning of unknown words.</p>	P WW23_GK_M4_Projected_...
23	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used text features to identify the main topic and key details in sections of <i>South America</i>.</p> <p>SC: I used knowledge of word relationships and illustrations in <i>Moon Rope</i> to define key vocabulary.</p> <p>SC: I determined shades of meaning between hitch and hang by acting out their meanings and analyzing how the meaning of the words change the meaning of the story.</p>	P WW23_GK_M4_Projected_...
24	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used text features to identify the main topic and key details in a section of <i>Australia</i>.</p> <p>SC: I added details to strengthen a piece of writing.</p> <p>SC: I determined the difference between a phrase and a complete sentence.</p>	P WW23_GK_M4_Projected_...

	SC: I identified the letter that should be capitalized in a complete sentence.	
25	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used photographs and details from the text to describe animals in <i>South America</i>.</p> <p>SC: I improved my writing using ideas from my friends.</p> <p>SC: I wrote a caption in a complete sentence with a capital letter.</p>	P WW23_GK_M4_Projected_...
26	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I answered questions using photographs and details from <i>South America</i>.</p> <p>SC: I formed an opinion about animals from <i>South America</i> and <i>Australia</i>.</p> <p>SC: I explained the meaning of grade level vocabulary.</p>	P WW23_GK_M4_Projected_...
27	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I supported my opinion about a continent using information from <i>South America and Australia</i>.</p> <p>SC: I improved my writing using ideas from my friends.</p> <p>SC: I explained the similarities and differences between <i>South America and Australia</i>.</p> <p>SC: I wrote a complete sentence with a capital letter.</p>	P WW23_GK_M4_Projected_...
28	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used different question words to ask questions about <i>Introducing North America</i>.</p> <p>SC: I explored the importance of a conclusion sentence in an opinion paragraph.</p> <p>SC: I identified a complete sentence and explained the end punctuation.</p>	P WW23_GK_M4_Projected_...
29	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used text features to identify the main topic and details in the book <i>Introducing North America</i>.</p> <p>SC: I created a complete sentence and explained the end punctuation.</p>	P WW23_GK_M4_Projected_...

30	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I used photographs and details from the text to describe natural features and animals in <i>Introducing North America</i>.</p> <p>SC: I formed an opinion about North America using the text <i>Introducing North America</i>.</p> <p>SC: I wrote a complete sentence with the correct punctuation mark.</p>	 WW23_GK_M4_Projected_...
31	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I found correct end punctuation. <b>**assessment**</b></p> <p>SC: I supported my opinion about North America using the text <i>Introducing North America</i>.</p> <p>SC: I explained the similarities and differences between <i>North America and World Atlas</i>.</p> <p>SC: I sorted photographs into the categories based on the natural feature it represents.</p>	 WW23_GK_M4_Projected_...
32	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I sorted texts into types of genres.</p> <p>SC: I orally described things using details.</p> <p>SC: I wrote a sentence and added to it.</p> <p>SC: I used a capital letter and the correct punctuation mark in my sentence.</p>	 WW23_GK_M4_Projected_...
33	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I explained the unique features, animals, and things to do on the different continents.</p> <p>SC: I described familiar places using descriptive words.</p> <p>SC: I explained the meaning of grade level vocabulary</p>	 WW23_GK_M4_Projected_...
34	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I explained the unique features, animals, and things to do on the different continents.</p> <p>SC: I looked closely at our writing and shared my thoughts in complete sentences.</p>	 WW23_GK_M4_Projected_...
35	<p>LT: I can explain what makes the world fascinating.</p>	 WW23_GK_M4_Projected_...

	<p>SC: I explained my understanding of the unique natural features, animals, and things to do on the different continents.</p> <p>SC: I orally described how a detail in one of my reasons compares to a characteristic of North America.</p> <p>SC: I looked closely at our writing and shared my thoughts in complete sentences.</p>	
36	<p>LT: I can explain what makes the world fascinating.</p> <p>SC: I thought about the learning across the whole year and shared a text that sparked a sense of interest.</p> <p>SC: I drew and labeled one detail from a module text that sparked a sense of interest.</p>	<p> WW23_GK_M4_Projected_...</p>

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Kindergarten Music	Music	Kindergarten	na
<b>Course Description:</b>			
<p>This classroom experience is a part of a sequential music curriculum, which offers each student the opportunity to engage in the art of music utilizing the Four Artistic Processes as outlined in the National Coalition for Core Arts Standards: Creating, Performing, Responding, and Connecting. This course provides an introduction to the musical concepts of Rhythm, Melody, Expression, Form, Timbre, Literacy and Technique. Students will explore these concepts through various musical activities including singing, performing on instruments, moving, composing and improvising, listening, and evaluating.</p>			
<b>Aligned Core Resources:</b>		<b>Connection to the <a href="#">BPS Vision of the Graduate</a></b>	
<p>First Steps in Music  The Book of Echo Songs  The Book of Movement Exploration  The Book of Fingerplays and Action Songs  The Book of Call &amp; Response  The Book of Children's Songtales  The Book of Beginning Circle Games  The Book of Pitch Exploration  The Book of Songs and Rhymes with Beat Motions  First Steps in Music with Orff Schulwerk  First Steps with The Nutcracker  First Steps in Global Music  First Step in Music for Infants and Toddlers (light purple)  First Steps in Music Vocal Development kit (White box)  Pitch Exploration Pathways posters  Pitch Exploration Stories posters  Down by the Bay posters  Oh in the Woods posters  Keeping the Beat (CD)  Music for Creative Movement (CD)  Move It #1 (DVD)  Move It #2 (DVD)  Lomax the Hound of Music (DVD)</p>		<p><b>SOCIAL AND CROSS-CULTURAL SKILLS</b></p> <ul style="list-style-type: none"> <li>- Know when it is appropriate to listen and when to speak</li> <li>- Conduct themselves in a respectable, professional manner</li> </ul> <p><b>EMPATHY</b></p> <ul style="list-style-type: none"> <li>- Demonstrating understanding of others perspectives and needs</li> <li>- Understand the concept of community as a means for supporting others in need</li> </ul> <p><b>COMMUNICATION</b></p> <ul style="list-style-type: none"> <li>- Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions. Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)</li> </ul> <p><b>CRITICAL THINKING AND PROBLEM SOLVING</b></p> <ul style="list-style-type: none"> <li>- Transfer knowledge to other situations</li> </ul>	
<b>Additional Course Information:</b> <i>Knowledge/Skill Dependent courses/prerequisites</i>		<b>Link to Completed <a href="#">Equity Audit</a></b>	
NA		 <b>Music K - Equity Curriculum Review</b>	
<b>Standard Matrix</b>			

District Learning Expectations and Standards	<a href="#">RH YTH M: Beat</a>	<a href="#">MELODY: Melodic Contour</a>	<a href="#">Dynamics (Loud &amp; Quiet)</a>	<a href="#">Tempo (Fast and Slow)</a>	<a href="#">I Sing, You Sing</a>	<a href="#">Same/Different</a>	<a href="#">Descriptive Music</a>	<a href="#">4 Voices</a>	<a href="#">One Voice or Many Voices</a>	<a href="#">How Do Instruments Sound?</a>	<a href="#">Reading Left to Right</a>	<a href="#">Tracking Top to Bottom (Melodic Contour)</a>	<a href="#">Rest, Ready, Perform</a>	<a href="#">Posture Matters!</a>
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**Creating**

MU:Cr1.1 Generate and conceptualize artistic ideas and work.	P		S	S		P					S	P		
MU:Cr2.1 Organize and develop artistic ideas and work.						S					S	S		
MU:Cr3.1 Refine and complete artistic work.						S					S	P		

**Performing**

MU:Pr4.1 Select, analyze and interpret artistic work for presentation.	S	P	S	P		P	P	S	S			S		
MU:Pr5.1 Develop and refine artistic techniques and work for presentation.			S	S	S							P	S	S
MU:Pr6.1 Convey meaning through the presentation of artistic work.	P	P	S	P	P				S			S	S	S

**Responding**

MU:Re7.1 Perceive and analyze artistic work.		P	S	S		P			S	S		S		
MU:Re8.1 Interpret intent and meaning in artistic work.			S	P						S				
MU:Re9.1 Apply criteria to evaluate artistic work.			S	S										

**Connecting**

MU:Ch10.0 Synthesize and	S		S	S		S						S		
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relate knowledge and personal experiences to make art.														
MU:Cn11.1 Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.		S	S	S		S								

**Unit Links**

<b>RHYTHM: Beat</b>	<b>5</b>
<b>MELODY: Melodic Contour</b>	<b>7</b>
<b>EXPRESSION: Dynamics (Loud &amp; Quiet)</b>	<b>10</b>
<b>EXPRESSION: Tempo (Fast and Slow)</b>	<b>13</b>
<b>FORM: I Sing, You Sing</b>	<b>16</b>
<b>FORM: Same/Different</b>	<b>18</b>
<b>FORM: Descriptive Music</b>	<b>21</b>
<b>TIMBRE: 4 Voices</b>	<b>23</b>
<b>TIMBRE: One Voice or Many Voices</b>	<b>25</b>
<b>TIMBRE: How Do Instruments Sound?</b>	<b>27</b>
<b>LITERACY: Reading Left to Right</b>	<b>30</b>
<b>LITERACY: Tracking Top to Bottom (Melodic Contour)</b>	<b>32</b>
<b>TECHNIQUE: Rest, Ready, Perform</b>	<b>35</b>
<b>TECHNIQUE: Posture Matters!</b>	<b>39</b>

**Unit Title:**

# RHYTHM: Beat

**Relevant Standards: Bold indicates priority**

**MU:Cr1.1.Ka** - With guidance, explore and experience music concepts (such as beat and melodic contour).

**MU:Cr1.1.Kb** - With guidance, generate musical ideas (such as movements or motives).

**MU:Pr4.3.Ka** - With guidance, demonstrate awareness of expressive qualities (such as voice quality, dynamics, and tempo) that support the creators' expressive intent.

**MU:Pr6.1.Ka** - With guidance, perform music with expression.

**MU:Pr6.1.Kb** - Perform appropriately for the audience.

**MU:Cn10.0.Ka** - Demonstrate how interests, knowledge, and skills relate to personal choices and intent when creating, performing, and responding to music

**Essential Question(s):**

**Cr1.1** - How do musicians generate creative ideas?  
**Pr4.3** - How do performers interpret musical works?  
**Pr6.1** - When is a performance judged ready to present?  
How do context and the manner in which musical work is presented influence audience response?  
**Cn10.0** - How do musicians make meaningful connections to creating, performing, and responding?

**Enduring Understanding(s):**

**Cr1.1** - The creative ideas, concepts, and feelings that influence musicians' work emerge from a variety of sources.  
**Pr4.3** - Performers make interpretive decisions based on their understanding of context and expressive intent.  
**Pr6.1** - Musicians judge performance based on criteria that vary across time, place, and cultures. The context and how a work is presented influence the audience response.  
**Cn10.0** - Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding

**Demonstration of Learning:**

- Perform steady beat for Engine, Engine using body percussion
- Perform steady beat for Engine, Engine using small percussion
- Perform steady beat for Pitter, Patter using body percussion
- Point to visual representation of steady beat for Pitter, Patter
- Perform steady beat for KTB #6 (Rameau) and KTB #18 (Locatelli) using body percussion
- Identify beat v. no beat worksheet

**Pacing for Unit**

Full year

**Family Overview (link below)**

Utilizing a repertoire of simple songs, games, audio recordings, and tunes, students will be expected to

**Integration of Technology:**

- Smartboard integration
- Youtube videos

create with, perform with, and respond to steady beat and rhythmic patterns.	<ul style="list-style-type: none"> <li>• Feierabend Move It Videos</li> <li>• Google Docs/Slides</li> </ul> CD Player/Speakers
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Beat Steady	Keeping the Beat CD, First Steps in Music book and CD, Small percussion instruments, beat pages, Move It DVDs, The Book of Fingerplays and Actions Songs, The Book of Songs and Rhymes with Beat Motions, Share the Music
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
Mathematics	<ul style="list-style-type: none"> <li>• Students do not pat their legs.</li> <li>• Students do not pat their leg to the beat.</li> <li>• Students do not use their instruments to show the beat.</li> <li>• Students do not use their instrument the correct way.</li> <li>• Students speak to show the beat instead of body percussion.</li> <li>• Students play the rhythm instead of the beat.</li> <li>• Students pat the rhythm instead of the beat.</li> </ul>
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
Tempo Reading Left to Right Descriptive Music Tracking Top to Bottom	Tempo Reading Left to Right Descriptive Music Tracking Top to Bottom
<b>Differentiation through Universal Design for Learning</b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<b>Interaction</b> 4.1 Vary and honor the methods for response, navigation, and movement	<ul style="list-style-type: none"> <li>• Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</li> <li>• Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</li> <li>•</li> </ul>
<b>Expression &amp; Communication</b> 5.1 Use multiple media for communication	<ul style="list-style-type: none"> <li>• Solve problems using a variety of strategies.</li> </ul>
<b>Supporting Multilingual/English Learners</b>	
<b>Related CELP standards:</b>	<b>Learning Targets:</b>
K.1 An EL can construct meaning from oral	K1. I can, with prompting and supports, identify a few

<p>presentations and literary and informational text through grade appropriate listening, reading, and viewing.</p> <p>K.2 An EL can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.</p>		<p>key words/attributes.</p> <p>K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.</p> <p>K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.</p>	
Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can perform a steady beat using my body.	I can use my hands and feet to match the steady beat of the music I hear	First Steps in Music repertoire, Beat pages, Move Its, Keeping the Beat CD, folk dances, small percussion
2	I can hear whether the sound I hear has a steady beat or not	I can confidently identify a steady beat when there is one	Collection of instrumental music with steady beat and ambient sound
3	I can perform the steady beat I hear with my finger on a page	I can use my finger to tap the steady beat icon on a beat sheet	Beat sheet
4	I can perform a steady beat using classroom instruments	I can use a classroom percussion instrument to demonstrate the steady beat	Percussion instruments
5	I can perform a steady beat when grouped in 3's	I can emphasize the first beat in a group of three	Collection of instrumental music with steady beat

Unit Title:

## MELODY: Melodic Contour

**Relevant Standards: Bold indicates priority**

**MU:Pr4.2.Ka - With guidance, explore and demonstrate awareness of music contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance.**

**MU:Pr6.1.Ka** - With guidance, perform music with expression.

**MU:Pr6.1.Kb** - Perform appropriately for the audience.

**MU:Re7.2.Ka - With guidance, demonstrate how a specific music concept (such as beat or melodic direction) is used in music.**

**MU:Cn11.0.Ka** - Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.

Essential Question(s):	Enduring Understanding(s):
<p><b>Pr4.2</b> - How does understanding the structure and context of musical works inform performance?</p> <p><b>Pr6.1</b> - When is a performance judged ready to present? How do context and the manner in which musical work is presented influence audience response?</p> <p><b>Re7.2</b> - How does understanding the structure and context of music inform a response?</p> <p><b>Cn11.0</b> - How do the other arts, other disciplines, contexts, and daily life inform creating, performing, and responding to music?</p>	<p><b>Pr4.2</b> - Analyzing creators' context and how they manipulate elements of music provides insight into their intent and informs performance.</p> <p><b>Pr6.1</b> - Musicians judge performance based on criteria that vary across time, place, and cultures. The context and how a work is presented influence the audience response.</p> <p><b>Re7.2</b> - Response to music is informed by analyzing context (social, cultural, and historical) and how creators and performers manipulate the elements of music.</p> <p><b>Cn11.0</b> - Understanding connections to varied contexts and daily life enhances musicians' creating, performing, and responding.</p>
Demonstration of Learning:	Pacing for Unit
<p>Create high/low patterns            Create Arioso            Perform high/low patterns            Perform echo patterns            Perform Simple Songs Identify high/low sounds</p>	<p>Year Long</p>
Family Overview (link below)	Integration of Technology:
<p>Utilizing a repertoire of simple songs, games, audio recordings, and tunes, students will be expected to create with, perform with, and respond to melodic contours and patterns.</p>	<p>Smartboard integration</p> <ul style="list-style-type: none"> <li>● Youtube videos</li> <li>● Feierabend Move It Videos</li> <li>● Google Docs/Slides</li> </ul> <p>CD Player/Speakers</p>
Unit-specific Vocabulary:	Aligned Unit Materials, Resources, and Technology (beyond core resources):
<p>Melody            Ariosa</p>	<p>First Steps in Music, The Book of Echo Songs, The Book of Call and Response Songs, Pitch Exploration Stories, Vocal Exploration Tub, Pitch Pathway Cards</p>
Opportunities for Interdisciplinary Connections:	Anticipated misconceptions:
<p>Cadence and contour of speaking.</p>	<ul style="list-style-type: none"> <li>- Students do not use their hands to follow the melodic contour.</li> <li>- Students use their talking voice instead of their singing voice.</li> </ul>
Connections to Prior Units:	Connections to Future Units:
<p>Tempo            Reading Left to Right            Descriptive Music Tracking Top to Bottom</p>	<p>Tempo            Reading Left to Right            Descriptive Music Tracking Top to Bottom</p>
<p><b>Differentiation through <a href="#">Universal Design for Learning</a></b></p>	

UDL Indicator	Teacher Actions:
<p><b>Perception</b> 1.2 Support multiple ways to perceive information</p>	<ul style="list-style-type: none"> <li>• Provide visual diagrams, charts, or notations of music or sound.</li> <li>• Provide visual and/or emotional description for musical interpretation.</li> </ul>
<p><b>Interaction</b> 4.1 Vary and honor the methods for response, navigation, and movement</p>	<ul style="list-style-type: none"> <li>• Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</li> <li>• Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</li> <li>•</li> </ul>
<p><b>Expression &amp; Communication</b> 5.1 Use multiple media for communication</p>	<ul style="list-style-type: none"> <li>• Solve problems using a variety of strategies.</li> </ul>

**Supporting Multilingual/English Learners**

Related CELP standards:	Learning Targets:
<p>K.2 An EL can . . . participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions. K.7 An EL can . . . adapt language choices to purpose, task, and audience when speaking and writing.</p>	<p>K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.</p> <p>K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.</p> <p>K.7 I can, with prompting and supports, repeat and use frequently occurring words and phrases.</p> <p>K.7 I can, with prompting and supports, recognize the meaning of high frequency words learned through conversations, reading, and being read to.</p>

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can perform high and low sounds with my voice.	I am changing the pitch of my voice to be high and low	First Steps in Music, Vocal Development Kit
2	I can identify sounds as high or low in a listening example	I can use the words “high” and “low” to describe the pitch of what I hear	First Steps in Music, Vocal Development Kit
3	I can perform combinations of high and low as a melodic contour	I can combine patterns of high and low sounds in my singing voice	First Steps in Music,

			Vocal Development Kit
4	I can identify melodic contour in listening examples	I can describe the direction and sequence of sounds I hear	First Steps in Music, Vocal Development Kit

Unit Title:

## EXPRESSION: Dynamics (Loud & Quiet)

### Relevant Standards: **Bold indicates priority**

**MU:Cr1.1.Ka** - With guidance, explore and experience music concepts (such as beat and melodic contour).

**MU:Cr1.1.Kb** - With guidance, generate musical ideas (such as movements or motives).

**MU:Pr4.2.Ka** - With guidance, explore and demonstrate awareness of music contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance.

**MU:Pr4.3.K** - With guidance, demonstrate awareness of expressive qualities (such as voice quality, dynamics, and tempo) that support the creators' expressive intent.

**MU:PR.5.Kb** - With appropriate guidance, use suggested strategies in rehearsal to improve expression in music.

**MU:Pr6.1.Ka** - With guidance, perform music with expression.

**MU:Pr6.1.Kb** - Perform appropriately for the audience.

**MU:Re7.2.1a** - With limited guidance, demonstrate and identify how specific music concepts (such as beat or pitch) are used in various styles of music for a purpose.

**MU:Re8.1.K** - With guidance, demonstrate awareness of expressive qualities (such as dynamics and tempo) that reflect creators'/performers' expressive intent.

**MU:Re9.1.Ka** - With guidance, apply personal and expressive preferences in the evaluation of music.

**MU:Cn10.0.K** - Demonstrate how interests, knowledge, and skills relate to personal choices and intent when creating, performing, and responding to music

**MU:Cn11.0.Ka**. Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.

### Essential Question(s):

**Cr1.1** - How do musicians generate creative ideas?

**Pr4.2** - How does understanding the structure and context of musical works inform performance?

**Pr4.3** - How do performers interpret musical works?

### Enduring Understanding(s):

**Cr1.1.Ka** The creative ideas, concepts, and feelings that influence musicians' work emerge from a variety of sources.

**Pr4.2** - Analyzing creators' context and how they manipulate elements of music provides insight into their

<p><b>PR.5</b> -How do musicians improve the quality of their performance?</p> <p><b>Pr6.1</b> - When is a performance judged ready to present? How do context and the manner in which musical work is presented influence audience response?</p> <p><b>Re7.2</b> - How does understanding the structure and context of music inform a response?</p> <p><b>Re8.1</b> - How do we discern the musical creators' and performers' expressive intent?</p> <p><b>Re9.1</b> - How do we judge the quality of musical work(s) and performance(s)</p> <p><b>Cn10.0</b> - How do musicians make meaningful connections to creating, performing, and responding?</p> <p><b>Cn11.0</b> - How do the other arts, other disciplines, contexts, and daily life inform creating, performing, and responding to music?</p>	<p>intent and informs performance.</p> <p><b>Pr4.3</b> - Performers make interpretive decisions based on their understanding of context and expressive intent.</p> <p><b>PR.5</b> - To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria.</p> <p><b>Pr6.1</b> - Musicians judge performance based on criteria that vary across time, place, and cultures. The context and how a work is presented influence the audience response.</p> <p><b>Re7.2</b> - Response to music is informed by analyzing context (social, cultural, and historical) and how creators and performers manipulate the elements of music.</p> <p><b>Re8.1</b> - Through their use of elements and structures of music, creators and performers provide clues to their expressive intent</p> <p><b>Re9.1</b> - The personal evaluation of musical work(s) and performance(s) is informed by analysis, interpretation, and established criteria</p> <p><b>Cn10.0</b> - Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding</p> <p><b>Cn11.0</b> - Understanding connections to varied contexts and daily life enhances musicians' creating, performing, and responding.</p>
<p><b>Demonstration of Learning:</b></p>	<p><b>Pacing for Unit</b></p>
<p>Create Loud/quiet sounds  Create fast/slow sounds  Perform loud/quiet sound/songs  Perform fast/slow sounds/songs  Identify loud/quiet sounds  Identify fast/slow sounds  Respond to loud/quiet and fast/slow with appropriate movements</p>	<p>full-year</p>
<p><b>Family Overview (link below)</b></p>	<p><b>Integration of Technology:</b></p>
<p><b>Utilizing a repertoire of simple songs, games, audio recordings, and tunes, students will be expected to create with, perform with, and respond to the expressive qualities of music.</b></p>	<p><i>Smart board</i></p>

<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Loud Quiet	First Steps in Music  Move It! DVDs  Vocal Development Kit
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
Animal Sounds, School Building Sounds	Confusing low with quiet and high with loud
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
What sounds do you hear in the room/place?	1st grade Piano and Forte
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<b>Perception</b> 1.2 Support multiple ways to perceive information	<ul style="list-style-type: none"> <li>• Provide visual diagrams, charts, or notations of music or sound.</li> <li>• Provide visual and/or emotional description for musical interpretation.</li> </ul>
<b>Interaction</b> 4.1 Vary and honor the methods for response, navigation, and movement	<ul style="list-style-type: none"> <li>• Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</li> <li>• Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</li> <li>•</li> </ul>
<b>Expression &amp; Communication</b> 5.1 Use multiple media for communication	<ul style="list-style-type: none"> <li>• Solve problems using a variety of strategies.</li> </ul>
<b>Supporting Multilingual/English Learners</b>	
<b>Related <a href="#">CELP standards:</a></b>	<b>Learning Targets:</b>
K.1 An EL can ... construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing. K.2 An EL can ... participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.	K1. I can, with prompting and supports, identify a few key words/attributes.  K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.  K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can perform loudly and quietly	I can use my body or voice to demonstrate the concepts of loud and quiet	First Steps in Music, Move It! DVDs, Vocal Development Kit
2	I can identify loud and quiet in listening selections	I can use the words of “loud” and “quiet” to describe the dynamics of what I hear	First Steps in Music, Move It! DVDs, Vocal Development Kit
3	I can create movements to represent loud and quiet	I can respond to the dynamics of music by creating a larger, heavier motion for loud and a gentler, smaller motion for quiet	First Steps in Music, Move It! DVDs, Vocal Development Kit
4	I can perform loudly and quietly using classroom instruments	I can use a classroom instrument to make loud and quiet sounds	First Steps in Music, Move It! DVDs, Vocal Development Kit

**Unit Title:**

## EXPRESSION: Tempo (Fast and Slow)

**Relevant Standards: Bold indicates priority**

**MU:Cr1.1.Ka** - With guidance, explore and experience music concepts (such as beat and melodic contour).

**MU:Cr1.1.Kb** - With guidance, generate musical ideas (such as movements or motives).

**MU:Pr4.2.K** - **With guidance, explore and demonstrate awareness of music contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance.**

**MU:Pr4.3.K** - **With guidance, demonstrate awareness of expressive qualities (such as voice quality, dynamics, and tempo) that support the creators’ expressive intent.**

**MU:PR.5.1.Kb** - With appropriate guidance, use suggested strategies in rehearsal to improve expression in music.

**MU:Pr6.1.Ka** - **With guidance, perform music with expression.**

**MU:Pr6.1.Kb** - **Perform appropriately for the audience.**

MU:Re7.2.K - With guidance, demonstrate how a specific music concept (such as beat or melodic direction) is used in music.

**MU:Re8.1.K** - **With guidance, demonstrate awareness of expressive qualities (such as dynamics and tempo) that reflect creators’/performers’ expressive intent.**

**MU:Re9.1.Ka** - With guidance, apply personal and expressive preferences in the evaluation of music.

**MU:Cn10.0.K** - Demonstrate how interests, knowledge, and skills relate to personal choices and intent when creating, performing, and responding to music

**MU:Cn11.0.K** - Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.

**Essential Question(s):**

- Cr1.1** - How do musicians generate creative ideas?
- Pr4.2** - How does understanding the structure and context of musical works inform performance?
- Pr4.3** - How do performers interpret musical works?
- PR.5.1** - How do musicians improve the quality of their performance?
- Pr6.1** - When is a performance judged ready to present? How do context and the manner in which musical work is presented influence audience response?
- Re7.2**-How does understanding the structure and context of music inform a response?
- Re8.1** - How do we discern the musical creators' and performers' expressive intent?
- Re9.1** - How do we judge the quality of musical work(s) and performance(s)
- Cn10.0** - How do musicians make meaningful connections to creating, performing, and responding?
- Cn11.0** - How do the other arts, other disciplines, contexts, and daily life inform creating, performing, and responding to music?

**Enduring Understanding(s):**

- Cr1.1** - The creative ideas, concepts, and feelings that influence musicians' work emerge from a variety of sources.
- Pr4.2** - Analyzing creators' context and how they manipulate elements of music provides insight into their intent and informs performance.
- Pr4.3** - Performers make interpretive decisions based on their understanding of context and expressive intent.
- PR.5.1** - To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria.
- Pr6.1** - Musicians judge performance based on criteria that vary across time, place, and cultures. The context and how a work is presented influence the audience response.
- Re7.2** - Response to music is informed by analyzing context (social, cultural, and historical) and how creators and performers manipulate the elements of music.
- Re8.1** - Through their use of elements and structures of music, creators and performers provide clues to their expressive intent
- Re9.1** - The personal evaluation of musical work(s) and performance(s) is informed by analysis, interpretation, and established criteria
- Cn10.0** - Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding
- Cn11.0** - Understanding connections to varied contexts and daily life enhances musicians' creating, performing, and responding.

**Demonstration of Learning:**

Match speed of beat movement exploration activities  
Wake Up You Sleepyheads

**Pacing for Unit**

Year Long

**Family Overview (link below)**

**Integration of Technology:**

<p><b>Utilizing a repertoire of simple songs, games, audio recordings, and tunes, students will be expected to create with, perform with, and respond to music in different tempi (speed).</b></p>	<p>Smartboard integration</p> <ul style="list-style-type: none"> <li>• Feierabend Move It Videos</li> <li>• Youtube videos</li> <li>• Google Docs/Slides</li> </ul> <p>CD Player/Speakers</p>
<p><b>Unit-specific Vocabulary:</b></p>	<p><b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b></p>
<p>Fast Slow Steady Beat</p>	<p>First Steps in Music, Move It! DVDs, Vocal Development Kit</p>
<p><b>Opportunities for Interdisciplinary Connections:</b></p>	<p><b>Anticipated misconceptions:</b></p>
<p>ELA, Science</p>	<p>Students struggling with maintaining a steady beat may not keep the tempo as fast or slow as necessary A fast tempo often causes students to excitedly rush and be <i>too fast</i> Rhythms and steady beat may be confounded with students choosing a tempo based on the rhythm pattern and not the beat.</p>
<p><b>Connections to Prior Units:</b></p>	<p><b>Connections to Future Units:</b></p>
<p>Beat</p>	<p>Dynamics</p>
<p><b>Differentiation through <a href="#">Universal Design for Learning</a></b></p>	
<p><b>UDL Indicator</b></p>	<p><b>Teacher Actions:</b></p>
<p><b>Perception</b> 1.2 Support multiple ways to perceive information</p>	<ul style="list-style-type: none"> <li>• Provide visual diagrams, charts, or notations of music or sound.</li> <li>• Provide visual and/or emotional description for musical interpretation.</li> </ul>
<p><b>Interaction</b> 4.1 Vary and honor the methods for response, navigation, and movement</p>	<ul style="list-style-type: none"> <li>• Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</li> <li>• Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</li> <li>•</li> </ul>
<p><b>Expression &amp; Communication</b> 5.1 Use multiple media for communication</p>	<ul style="list-style-type: none"> <li>• Solve problems using a variety of strategies.</li> </ul>
<p><b>Related <a href="#">CELP standards:</a></b></p>	<p><b>Learning Targets:</b></p>
<p>K.1 An EL can . . . construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing. K.2 An EL can . . . participate in grade appropriate oral</p>	<p>K1. I can, with prompting and supports, identify a few key words/attributes. K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a</p>

and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.		limited number of words and phrases acquired in conversations and being read to.	
		K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.	
Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can perform in ways that are fast and slow	I can use my body or voice to demonstrate the concepts of fast and slow	First Steps in Music repertoire, Move Its, Keeping the Beat CD, folk dances
2	I can identify fast and slow in listening selections.	I can use the words of "fast" and "slow" to describe the tempo of what I he	First Steps in Music repertoire, Move Its, Keeping the Beat CD, folk dances
3	I can create movements to represent fast and slow.	I can respond to the tempo of music by creating a smaller, quicker motions for fast and a slower, longer motions for slow	First Steps in Music repertoire, Beat pages, Move Its, Keeping the Beat CD, folk dances, small percussion
4	I can perform fast and slow sequences of sounds using classroom instruments SC:	I can use a classroom instrument to play quickly or slowly	Vocal Development Kit, Small Percussion

<b>Unit Title:</b>	
FORM: I Sing, You Sing	
<b>Relevant Standards: Bold indicates priority</b>	
MU:Pr5.1.Ka - With guidance, apply personal, teacher, and peer feedback to refine performances.	
<b>MU:Pr6.1.Ka - With guidance, perform music with expression.</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<b>Pr5.1</b> - How do musicians improve the quality of their performance? <b>Pr6.1</b> - When is a performance judged ready to present? How do context and the manner in which musical work is presented influence audience response?	<b>Pr5.1</b> - To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria. <b>Pr6.1</b> - Musicians judge performance based on criteria that vary across time, place, and cultures. The context and how a work is presented influence the audience

	response
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• Oh My, No More Pie (echo)</li> <li>• Where, Oh Where</li> <li>• John the Rabbit (Call and response)</li> </ul>	Year Long
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<b>Utilizing a repertoire of simple songs, games, iconic notation, non-linguistic representation, audio recordings, poems, and tunes, students will be expected to create with, perform with, and respond to same/different patterns.</b>	Smartboard
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Singing Voice Pitch	The Book of Call and Response Songs, The Book of Echo Songs, First Steps in Music – Book and CD, Lomax the Hound of Music DVD
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
ELA	Students use a speaking voice instead of a singing voice Students use a singing voice but at too high or low of a pitch
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
Melodic Contour	1st Grade Do Re Mi
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<b>Perception</b> 1.2 Support multiple ways to perceive information	<ul style="list-style-type: none"> <li>• Provide visual diagrams, charts, or notations of music or sound.</li> <li>• Provide visual and/or emotional description for musical interpretation.</li> </ul>
<b>Interaction</b> 4.1 Vary and honor the methods for response, navigation, and movement	<ul style="list-style-type: none"> <li>• Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</li> <li>• Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</li> <li>•</li> </ul>
<b>Expression &amp; Communication</b> 5.1 Use multiple media for communication	<ul style="list-style-type: none"> <li>• Solve problems using a variety of strategies.</li> </ul>

Supporting Multilingual/English Learners			
Related CELP standards:		Learning Targets:	
K.1 I can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing		K1. I can, with prompting and supports, identify a few key words/attributes.	
Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
	I can accurately echo song fragments and patterns	I can use matching pitch and rhythm to perform the same pattern as the teacher	
	I can accurately perform a complete echo song	I can use matching pitch and rhythm to consistently perform an echo to my teacher's singing	
	I can accurately provide responses to a call and response activity	I can use matching pitch and rhythm to perform the response of a different pattern to my teacher's call	
	I can accurately perform along to a complete call and response song	I can use matching pitch and rhythm to consistently perform the response to my teacher's call	

Unit Title:
FORM: Same/Different
Relevant Standards: Bold indicates priority
<b>MU:Cr1.1.Ka</b> - With guidance, explore and experience music concepts (such as beat and melodic contour).
<b>MU:Cr2.1.Kb</b> - With guidance, organize personal musical ideas using iconic notation and/or recording technology.
<b>MU:Cr3.1.K</b> - With guidance, apply personal, peer, and teacher feedback in refining personal musical ideas.
<b>MU:Pr4.2.K</b> - With guidance, explore and demonstrate awareness of music contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance.
<b>MU:Pr4.3.K</b> - With guidance, demonstrate awareness of expressive qualities (such as voice quality, dynamics, and tempo) that support the creators' expressive intent.

**MU:Re7.2.K - With guidance, demonstrate how a specific music concept (such as beat or melodic direction) is used in music.**

**MU:Cn10.1.K - Demonstrate how interests, knowledge, and skills relate to personal choices and intent when creating, performing, and responding to music.**

**MU:Cn11.1.K - Demonstrate understanding of relationships between music and the other arts, other disciplines, varied contexts, and daily life.**

Essential Question(s):	Enduring Understanding(s):
<p><b>Cr1.1</b> - How do musicians generate creative ideas?  <b>Cr2.1</b> - How do musicians make creative decisions?  <b>Cr3.1</b> - How do musicians improve the quality of their creative work?  <b>Pr4.2</b> - How does understanding the structure and context of music inform a response?  <b>Re7.2</b> - How does understanding the structure and context of musical works inform performance?  <b>Cn10.1</b> - How do musicians make meaningful connections to creating, performing, and responding?  <b>Cn11.1</b> - How do the other arts, other disciplines, contexts, and daily life inform creating, performing, and responding to music?</p>	<p><b>Cr1.1</b> - The creative ideas, concepts, and feelings that influence musicians' work emerge from a variety of sources.  <b>Cr2.1</b> - Musicians' creative choices are influenced by their expertise, context, and expressive intent.  <b>Cr3.1</b> - Musicians evaluate, and refine their work through openness to new ideas, persistence, and the application of appropriate criteria.  <b>Pr4.2</b> - Analyzing creators' context and how they manipulate elements of music provides insight into their intent and informs performance.  <b>Re7.2</b> - Response to music is informed by analyzing context (social, cultural, and historical) and how creators and performers manipulate the elements of music.  <b>Cn10.1</b> - Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding.  <b>Cn11.1</b> - Understanding connections to varied contexts and daily life enhances musicians' creating, performing, and responding.</p>
Demonstration of Learning:	Pacing for Unit
<ul style="list-style-type: none"> <li>• Waltz in Ab, Brahms, Move It! #1 – Track 2</li> <li>• Create same, similar, and different instrument pieces with iconic notation</li> </ul>	Year Long
Family Overview (link below)	Integration of Technology:
<p><b>Utilizing a repertoire of simple songs, games, iconic notation, non-linguistic representation, audio recordings, poems, and tunes, students will be expected to create with, perform with, and respond to same/different patterns.</b></p>	<p>Drag/identify images of musical notation into categories of same and different using the Smartboard and MusicFirst Elementary</p>
Unit-specific Vocabulary:	Aligned Unit Materials, Resources, and Technology (beyond core resources):
Same and Different	First Steps in Music, Move It! DVDs, Vocal Development Kit
Opportunities for Interdisciplinary Connections:	Anticipated misconceptions:
Math problems that are same/different, weather that is	Confusing low with quiet and high with loud

the same/different, words that sound the same/different			
<b>Connections to Prior Units:</b>		<b>Connections to Future Units:</b>	
Tempo, Dynamics, Melodic Contour		1st grade Piano and Forte	
<b>Differentiation through Universal Design for Learning</b>			
<b>UDL Indicator</b>		<b>Teacher Actions:</b>	
<b>Expression and Communication</b> 5.3 Build fluencies with graduated levels of support for practice and performance		<ul style="list-style-type: none"> <li>Use scaffolds that can be gradually released with increasing independence and skills (e.g., embedded into digital reading and writing software).</li> </ul>	
<b>Welcoming Interests &amp; Identities</b> 7.2 Optimize relevance, value, and authenticity		<ul style="list-style-type: none"> <li>Design activities so learning outcomes are authentic, communicate to real audiences, and reflect a purpose that is clear to the participants.</li> </ul>	
<b>Supporting Multilingual/English Learners</b>			
<b>Related CELP standards:</b>		<b>Learning Targets:</b>	
K.1 I can construct meaning from oral presentations and literary and informational text (or music) through grade appropriate listening, reading, and viewing.		K1. I can, with prompting and supports, identify a few key words/attributes.	
<b>Lesson Sequence</b>	<b>Learning Target</b>	<b>Success Criteria/ Assessment</b>	<b>Resources</b>
	I can echo songs and patterns	I can perform the same pattern as the teacher	Lomax, the Hound of Music DVD (Too-da-la & Pay Me My Money Down), First Steps in Music, The Book of Echo Songs, The Book of Call and Response Songs
	I can respond to a call and response activity	I can perform the response of a different pattern to my teacher's call	First Steps in Music, The Book of Echo songs, The Book of Call and response songs
	I can identify whether two musical patterns are the same or different from each other	I can use the words "same" and "different" to compare two musical patterns	First Steps in Music, The Book of Echo songs, The Book of Call and response songs
	I can follow along to an iconic listening	I can place my finger on	First Steps in Music, The

	map of same and different patterns	the picture that represents the pattern I hear	Book of Echo songs, The Book of Call and response songs Listening maps
	I can identify a piece of instrumental music by connecting the musical elements to a non-musical idea	I can use musical elements I hear to identify the corresponding animal of a Carnival of the Animals selection	First Steps in Music, The Book of Echo songs, The Book of Call and response songs Listening Maps

**Unit Title:**

## FORM: Descriptive Music

**Relevant Standards: Bold indicates priority**

**MU:Pr4.2.Ka - With guidance, explore and demonstrate awareness of music contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance .**

**MU:Pr4.3.Ka - With guidance, demonstrate awareness of expressive qualities (such as voice quality, dynamics, and tempo) that support the creators' expressive intent.**

**Essential Question(s):**

**Pr4.2.Ka** How does understanding the structure and context of musical works inform performance?  
**Pr4.3.Ka** How do performers interpret musical works?

**Enduring Understanding(s):**

**Pr4.2.Ka** Analyzing creators' context and how they manipulate elements of music provides insight into their intent and informs performance.  
**Pr4.3.Ka** Performers make interpretive decisions based on their understanding of context and expressive intent.

**Demonstration of Learning:**

- Aural discrimination worksheets - Choose one from the drive
- Demonstrating appropriate gross motor skills to a variety of musical selections

**Pacing for Unit**

Trimesters 2 and 3

**Family Overview (link below)**

**Utilizing a repertoire of simple songs, games, iconic notation, non-linguistic representation, audio recordings, poems, and tunes, students will be expected to create with, perform with, and respond to same/different patterns.**

**Integration of Technology:**

Drag and drop images of Carnival of the animals into fast, slow, same, different, loud, soft, high, low categories

**Unit-specific Vocabulary:**

**Aligned Unit Materials, Resources, and Technology (beyond core resources):**

Fast Slow Loud Soft Same Different	Music in Motion Carnival of the Animals coloring book, Teacher developed aural discrimination worksheets (to be stored on the shared drive), Picture book/CD		
<b>Opportunities for Interdisciplinary Connections:</b>		<b>Anticipated misconceptions:</b>	
Life science - animal life		Confusing low with quiet and high with loud	
<b>Connections to Prior Units:</b>		<b>Connections to Future Units:</b>	
Quiet/Loud, Fast/Slow, Same/Different		1st Grade Piano and Forte	
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>			
<b>UDL Indicator</b>		<b>Teacher Actions:</b>	
7.2 Optimize relevance, value, and authenticity		<ul style="list-style-type: none"> <li>Design activities so that learning outcomes are authentic, communicate to real audiences, and reflect a purpose that is clear to the participants</li> <li>Provide tasks that allow for active participation, exploration and experimentation</li> </ul>	
<b>Supporting Multilingual/English Learners</b>			
<b>Related <a href="#">CELP standards:</a></b>		<b>Learning Targets:</b>	
K.1 I can construct meaning from oral presentations and literary and informational text (or music) through grade appropriate listening, reading, and viewing.		K1. I can, with prompting and supports, identify a few key words/attributes.	
<b>Lesson Sequence</b>	<b>Learning Target</b>	<b>Success Criteria/ Assessment</b>	<b>Resources</b>
	I can listen attentively to a piece of instrumental music	I can demonstrate active listening expectations while a piece of instrumental music is played	Music in Motion Carnival of the Animals coloring book, Teacher developed aural discrimination worksheets (on the shared drive), Picture book/CD
	I can use movement to represent the instrumental music I hear	I can move my body high or low, loud or quiet, and fast or slow in response to selections from Carnival of the Animals	Music in Motion Carnival of the Animals coloring book, Teacher developed aural discrimination worksheets (on the shared drive), Picture book/CD
	I can use classroom materials and instruments to perform along to instrumental music	I can use materials similarly to the musical elements heard in	Music in Motion Carnival of the Animals coloring book, Teacher developed

		selections of Carnival of the Animals	aural discrimination worksheets (on the shared drive), Picture book/CD
	I can describe how high or low, loud or quiet, and fast or slow can connect to non-musical things	I can describe the animals from the Carnival of the Animals using our Kindergarten music vocabulary	Music in Motion Carnival of the Animals coloring book, Teacher developed aural discrimination worksheets (on the shared drive), Picture book/CD
	I can identify a piece of instrumental music by connecting the musical elements to a non-musical idea	I can use musical elements I hear to identify the corresponding animal of a Carnival of the Animals selection	Music in Motion Carnival of the Animals coloring book, Teacher developed aural discrimination worksheets (on the shared drive), Picture book/CD

**Unit Title:**

## TIMBRE: 4 Voices

**Relevant Standards: Bold indicates priority**

**MU:Pr4.2.Ka** - With guidance, explore and demonstrate awareness of music contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance .

**Essential Question(s):**

**Pr4.2.Ka** How does understanding the structure and context of musical works inform performance?

**Enduring Understanding(s):**

**Pr4.2.Ka** Analyzing creators' context and how they manipulate elements of music provides insight into their intent and informs performance.

**Demonstration of Learning:**

Identify speaking, singing, whisper, and shout voices  
Perform speaking, singing, whisper, and shout voices  
Create speaking, singing, whisper, and shout voices

**Pacing for Unit**

Year-long

**Family Overview (link below)**

**Utilizing their voice students will be expected to create, perform, and respond with appropriate vocal techniques.**

**Integration of Technology:**

Smartboard integration

- Google Docs/Slides

CD Player/Speakers

<b>Unit-specific Vocabulary:</b>		<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>	
<ul style="list-style-type: none"> <li>Poems, songs, finger plays, and chants using speaking, singing, whisper, and shout voices</li> </ul>		Share the Music (K), First Steps in Music	
<b>Opportunities for Interdisciplinary Connections:</b>		<b>Anticipated misconceptions:</b>	
ELA		<ul style="list-style-type: none"> <li>Students still learning to be comfortable in their singing voices may reduce to a whisper or a speaking voice</li> <li>Students who are overly excited or confident may over-sing into a shouting voice</li> <li>Shouting voice may be conflated with screaming, when it is simply a louder speaking voice.</li> </ul>	
<b>Connections to Prior Units:</b>		<b>Connections to Future Units:</b>	
Same/Different		Melodic Contour, Dynamics, I Sing You Sing, One Voice or Many Voices	
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>			
<b>UDL Indicator</b>		<b>Teacher Actions:</b>	
1.2 Offer alternatives to auditory information 3.1 Activate or supply background knowledge		1.2 Provide visual diagrams, charts, notations of music or sound 3.1 Anchor instruction by linking to and activating relevant prior knowledge of shouting, talking, and whispering	
<b>Supporting Multilingual/English Learners</b>			
<b>Related <a href="#">CELP standards:</a></b>		<b>Learning Targets:</b>	
K.2 I can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.		K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to. K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.	
<b>Lesson Sequence</b>	<b>Learning Target</b>	<b>Success Criteria/ Assessment</b>	<b>Resources</b>
	I can change my voice to a whisper, talk, shout or sing to echo my teacher's four voices	I can change my volume and pitch to match that of my teacher	First Steps in Music repertoire
	I can change my voice to a whisper, talk, shout or sing to perform appropriately to a song or poem	I can change my volume and pitch to appropriately perform a song or poem	First Steps in Music repertoire

	I can identify if the voice I hear is in a whisper, talk, shout, or singing voice	I can use the four voices vocabulary to describe the performing voice I hear	First Steps in Music repertoire

**Unit Title:**

## TIMBRE: One Voice or Many Voices

**Relevant Standards: Bold indicates priority**

**MU:Pr4.2.Ka** - With guidance, explore and demonstrate awareness of musical contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance.

**MU:Pr6.1.Kb** - Perform appropriately for the audience.

**Essential Question(s):**

**Pr4.2.Ka** - How does understanding the structure and context of musical works inform performance?  
**Pr6.1.Kb** - How do context and the manner in which musical work is presented influence audience response?

**Enduring Understanding(s):**

**Pr4.2.Ka** - Analyzing creators' context and how they manipulate elements of music provides insight into their intent and informs performance.  
**Pr6.1.Kb** - Musicians judge performance based on criteria that vary across time, place, and cultures. The context and how a work is presented influence the audience response.

**Demonstration of Learning:**

Identify one voice vs many voices  
 Perform one voice vs many voices  
 Create one voice vs many voices

**Pacing for Unit**

Year-long

**Family Overview (link below)**

**Utilizing a repertoire of simple songs, games, audio recordings, and tunes, students will be expected to create with, perform with, and respond to the four voice types and solo/unison timbres.**

**Integration of Technology:**

Smartboard  
 Various CDs  
 Various DVDs

**Unit-specific Vocabulary:**

Solo  
 Unison  
 Tutti

**Aligned Unit Materials, Resources, and Technology (beyond core resources):**

Share the Music (K), First Steps in Music

<b>Opportunities for Interdisciplinary Connections:</b>		<b>Anticipated misconceptions:</b>	
ELA		Students can't wait for a turn Students misidentify solo vs tutti Students can't identify one voice vs many voices	
<b>Connections to Prior Units:</b>		<b>Connections to Future Units:</b>	
Same/Different 4 Voices		Melodic Contour, Dynamics, I Sing You Sing	
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>			
<b>UDL Indicator</b>		<b>Teacher Actions:</b>	
<b>Perception</b> <b>1.2 Support multiple ways to perceive information</b>  <b>Interaction</b> <b>4.1 Vary and honor the methods for response, navigation, and movement</b>  <b>Expression &amp; Communication</b> <b>5.1 Use multiple media for communication</b>		<b>Provide visual diagrams, charts, or notations of music or sound.</b> <b>Provide visual and/or emotional description for musical interpretation.</b>  <b>Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</b> <b>Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</b>  <b>Solve problems using a variety of strategies.</b>	
<b>Supporting Multilingual/English Learners</b>			
<b>Related <a href="#">CELP standards:</a></b>		<b>Learning Targets:</b>	
K.1 I can construct meaning from oral presentations and literary and informational text (or music) through grade appropriate listening, reading, and viewing.  K.2 I can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.		K1. I can, with prompting and supports, identify a few key words/attributes.  K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.  K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.	
<b>Lesson Sequence</b>	<b>Learning Target</b>	<b>Success Criteria/ Assessment</b>	<b>Resources</b>
1	I can sing a song fragment as a solo	I can perform a song fragment by singing it as a solo	First Steps in Music repertoire
2	I can use the term unison to identify when many people sing the same thing	I can use the word unison when asked to describe a listening example featuring many people singing the same melody	First Steps in Music repertoire

3	I can use the term solo to identify when one person sings alone	I can use the word solo when asked to describe a listening example featuring a single person singing	First Steps in Music repertoire

<b>Unit Title:</b>	
<h1>TIMBRE: How Do Instruments Sound?</h1>	
<b>Relevant Standards: Bold indicates priority</b>	
<p><b>MU:Re7.1.K</b> - With guidance, list personal interests and experiences and demonstrate why they prefer some music selections over others.</p> <p><b>MU:Re8.1.K</b> - With guidance, demonstrate awareness of expressive qualities (such as dynamics and tempo) that reflect creators'/performers' expressive intent.</p>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<p><b>MU:Re7.1.K</b> How do individuals choose music to experience?</p> <p><b>Re8.1.K</b> How do we discern the musical creators' and performers' expressive intent?</p>	<p><b>MU:Re7.1.K:</b> Individuals' selection of musical works is influenced by their interests, experiences, understandings, and purposes</p> <p><b>Re8.1.K</b> Through their use of elements and structures of music, creators and performers provide clues to their expressive intent.</p>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>Listening worksheet</li> </ul>	Year-long
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<p><b>Utilizing a repertoire of simple songs, games, audio recordings, and tunes, students will be expected to create with, perform with, and respond to the four voice types and solo/unison timbres.</b></p>	<p>Smartboard</p> <p>First Steps in Music CD's</p> <p>First Steps in Music DVD's</p>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<p>Instrument</p> <p>Shake</p> <p>Hit</p> <p>Scrape</p> <p>Listen</p>	<p>First Steps in Music; Conversational Solfege; Other Kindergarten repertoire</p>

<b>Opportunities for Interdisciplinary Connections:</b>		<b>Anticipated misconceptions:</b>	
Physical Education		<ul style="list-style-type: none"> <li>• Students just stop.</li> <li>• Students don't perform at the correct time.</li> <li>• Students assume that since similar instruments are used, it's the same music</li> <li>• Confusing low with quiet and high with loud</li> <li>• Students do not use their instrument the correct way.</li> </ul>	
<b>Connections to Prior Units:</b>		<b>Connections to Future Units:</b>	
Beat Dynamics Tempo Same/ Different Descriptive Music Four Voices		All future instrumental/performance units	
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>			
<b>UDL Indicator</b>		<b>Teacher Actions:</b>	
<p><b>Perception</b> <b>1.2 Support multiple ways to perceive information</b></p> <p><b>Interaction</b> <b>4.1 Vary and honor the methods for response, navigation, and movement</b></p> <p><b>Expression &amp; Communication</b> <b>5.1 Use multiple media for communication</b></p>		<p><b>Provide visual diagrams, charts, or notations of music or sound.</b> <b>Provide visual and/or emotional description for musical interpretation.</b></p> <p><b>Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</b> <b>Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</b></p> <p><b>Solve problems using a variety of strategies.</b></p>	
<b>Supporting Multilingual/English Learners</b>			
<b>Related <a href="#">CELP standards:</a></b>		<b>Learning Targets:</b>	
<p>K.1 An EL can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing</p> <p>K.2: An EL can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions</p>		<p>K1. I can, with prompting and supports, identify a few key words/attributes.</p> <p>K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.</p> <p>K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.</p>	
<b>Lesson</b>	<b>Learning Target</b>	<b>Success Criteria/</b>	<b>Resources</b>

Sequence		Assessment	
1	I can perform with classroom percussion	I can use my classroom percussion using the techniques shown by my teacher	First Steps in Music repertoire
2	I can listen to music featuring the percussion instruments used in class	I can actively listen to musical examples that feature percussion instruments used in class"	First Steps in Music repertoire
3	I can describe various classroom percussion instruments by comparing and contrasting its sound qualities	I can use descriptive words to compare the different sound qualities of classroom percussion instruments	First Steps in Music repertoire
4	I can aurally identify various classroom percussion instruments	I can name a classroom instrument I hear by noticing its different sound qualities	First Steps in Music repertoire

**Unit Title:**

## LITERACY: Reading Left to Right

**Relevant Standards: Bold indicates priority**

**MU:Cr1.1.Ka** – With guidance, explore and experience music concepts (such as beat and melodic contour).

**MU:Cr1.1.Kb** – With guidance, generate musical ideas (such as movements or motives)

**MU:Cr2.1.Ka** – With guidance, demonstrate and choose favorite musical ideas

**MU:Cr2.1.Kb** – With guidance, organize personal musical ideas using iconic notation and/or recording technology

**MU:Cr3.1.K** – With guidance, apply personal, peer, and teacher feedback in refining personal musical ideas

**MU:Cr3.2.K** – With guidance, demonstrate a final version of personal musical ideas to peers

**Essential Question(s):**

**Cr1.1.Ka** How do musicians generate creative ideas?  
**Cr2.1.Ka**How do musicians make creative decisions?  
**Cr3.1.K**How do musicians improve the quality of their creative work?  
**Cr3.2.K**When is creative work ready to share?

**Enduring Understanding(s):**

**Cr1.1.Ka**The creative ideas, concepts, and feelings that influence musicians' work emerge from a variety of sources  
**Cr2.1.Ka**How do musicians make creative decisions?  
**Cr3.1.K** Musicians evaluate, and refine their work through openness to new ideas, persistence, and the application of appropriate criteria  
**Cr3.2.K**Musicians' presentation of creative work is the

	culmination of a process of creation and communication
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
Perform Feierabend pitch pathway flashcards, track left to right  Create and perform original pitch pathway, track left to right	year-long
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<b>Utilizing iconic notation, listening maps, and non-linguistic representation, students will be expected to create with, perform with, and respond to melodic contour, steady beat, and same/different patterns.</b>	Smartboard
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Pathway Left Right Start End	Feierabend pitch pathway flashcards  Manipulatives for creating pathways (yarn, pipe cleaners, markers, etc.)
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
ELA	<ul style="list-style-type: none"> <li>• Students move their voices in the wrong direction, with/without an example to follow</li> <li>• Students move their voices at random</li> </ul>
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
Melodic Contour Same/Different Descriptive Music I Sing, You Sing Four Voices	All future music literacy units
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<b>Perception</b> <b>1.2 Support multiple ways to perceive information</b>  <b>Interaction</b> <b>4.1 Vary and honor the methods for response, navigation, and movement</b>	<b>Provide visual diagrams, charts, or notations of music or sound.</b> <b>Provide visual and/or emotional description for musical interpretation.</b>  <b>Offer options for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control).</b> <b>Offer options for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard.</b>

<b>Expression &amp; Communication</b> <b>5.1 Use multiple media for communication</b>		<b>Solve problems using a variety of strategies.</b>	
<b>Supporting Multilingual/English Learners</b>			
<b>Related CELP standards:</b>		<b>Learning Targets:</b>	
<p>K.1 An EL can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing</p> <p>K.2: An EL can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions</p>		<p>K1. I can, with prompting and supports, identify a few key words/attributes.</p> <p>K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.</p> <p>K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.</p>	
<b>Lesson Sequence</b>	<b>Learning Target</b>	<b>Success Criteria/ Assessment</b>	<b>Resources</b>
1	I can echo my teacher's musical patterns	I can correctly perform a matching pattern to that of my teacher	First Steps in Music, The Book of Echo songs, The Book of Call and response songs
2	I can use my finger moving left to right to follow a listening map of a musical pattern	I can place my finger on the correct spot on the page as the pattern changes	First Steps in Music, The Book of Echo songs, The Book of Call and response songs
3	I can improvise and create a simple rhythm pattern that I can recall	I can clap an original rhythm pattern that I can remember and repeat	First Steps in Music, The Book of Echo songs, The Book of Call and response songs
4	I can use shapes to notate a simple rhythm pattern I create	I can sequence shapes from left to right to match my rhythm pattern	First Steps in Music, The Book of Echo songs, The Book of Call and response songs

<b>Unit Title:</b>
<b>LITERACY: Tracking Top to Bottom (Melodic Contour)</b>
<b>Relevant Standards: Bold indicates priority</b>
<b>MU:Cr1.1.Ka - With guidance, explore and experience music concepts (such as beat and melodic contour).</b>
MU:Cr1.1.Kb - With guidance, generate musical ideas (such as movements or motives).

**MU:Cr2.1.Kb - With guidance, organize personal musical ideas using iconic notation and/or recording technology.**

**MU:Cr3.1.Ka - With guidance, apply personal, peer, and teacher feedback in refining personal musical ideas.**

**MU:Cr3.2.Ka - With guidance, demonstrate a final version of personal musical ideas to peers.**

**MU:Pr4.2.Ka - With guidance, explore and demonstrate awareness of music contrasts (such as high/low, loud/soft, same/different) in a variety of music selected for performance.**

MU:Pr5.1.Ka: With guidance, apply personal, teacher, and peer feedback to refine performances.

**MU:Pr6.1.Kb - Perform appropriately for the audience.**

**MU:Re7.2.Ka - With guidance, demonstrate how a specific music concept (such as beat or melodic direction) is used in music.**

**MU:Cn10.1.Ka - Demonstrate how interests, knowledge, and skills relate to personal choices and intent when creating, performing, and responding to music.**

Essential Question(s):	Enduring Understanding(s):
<p><b>Cr1.1.Ka</b> How do musician’s generate creative ideas?  <b>Cr2.1.Kb</b> How do musicians make creative decisions?  <b>Cr3.1.Ka</b> How do musicians improve the quality of their creative work?  <b>Cr3.2.Ka</b> When is creative work ready to share?  <b>Pr4.2.Ka</b> How does understanding the structure and context of musical works inform performance?  Pr5.1.Ka How do musicians improve the quality of their performance?  <b>Pr6.1.Kb</b> When is a performance judged ready to present? How do context and the manner in which musical work is presented influence audience response?  <b>Re7.2.Ka</b> How does understanding the structure and context of music inform a response?  <b>Cn10.1.Ka</b> How do musicians make meaningful connections to creating, performing, and responding?</p>	<p><b>Cr1.1.Ka</b> The creative ideas, concepts and feelings that influence musicians’ work emerge from a variety of sources.  <b>Cr2.1.Kb</b> Musicians’ creative choices are influenced by their expertise, context, and expressive intent.  <b>Cr3.1.Ka</b> Musicians evaluate, and refine their work through openness to new ideas, persistence, and the application of appropriate criteria.  <b>Cr3.2.Ka</b> Musicians’ presentation of creative work is the culmination of a process of creation and communication.  <b>Pr4.2.Ka</b> Analyzing creators’ context and how they manipulate elements of music provides insight into their intent and informs performance.  Pr5.1.Ka To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria.  <b>Pr6.1.Kb</b> Musicians judge performance based on criteria that vary across time, place, and cultures. The context and how a work is presented influence the audience response  <b>Re7.2.Ka</b> Response to music is informed by analyzing context (social, cultural, and historical) and how creators and performers manipulate the elements of music.  <b>Cn10.1.Ka</b> Musicians connect their personal interests, experiences, ideas, and knowledge to creating, performing, and responding.</p>
Demonstration of Learning:	Pacing for Unit
<p>Perform Feierabend pitch pathway flashcards, track top to bottom using high and low singing voices</p>	<p>Year Long</p>

Create and perform original pitch pathway card, tracking top to bottom using their finger and high and low singing voice	
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
Utilizing iconic notation, listening maps, and non-linguistic representation, students will be expected to create with, perform with, and respond to melodic contour and high/low sounds	Smartboard
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Pitch Pathway Melody Direction High Low Top Bottom Start End	Feierabend pitch pathway flashcards  Feierabend pitch exploration stories  Manipulatives for creating pathways (yarn, pipe cleaners, markers, etc.)  Slide whistle
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
ELA	<ul style="list-style-type: none"> <li>• Students just move their voices up and down at random, not following the direction of a contoured line</li> <li>• Students move their voices in the wrong direction, with/without an example to follow</li> </ul>
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
Melodic Contour Same/Different Descriptive Music I Sing, You Sing Four Voices Reading Left to Right	All future music literacy units
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
Optimize individual choice and autonomy (checkpoint7.1)  Offer alternatives for visual information (checkpoint1.3)  Vary the methods for response and navigation (checkpoint4.1)	7.1: Provide learners with as much discretion and autonomy as possible by providing choices in such things as: The level of perceived challenge The type of rewards or recognition available The context or content used for practicing and assessing skills The tools used for information gathering or production The color, design, or graphics of layouts, etc. The sequence or timing for completion of subcomponents of tasks

Allow learners to participate in the design of classroom activities and academic tasks  
 Involve learners, where and whenever possible, in setting their own personal academic and behavioral goals

1.3:  
 Provide descriptions (text or spoken) for all images, graphics, video, or animations  
 Use touch equivalents (tactile graphics or objects of reference) for key visuals that represent concepts  
 Provide physical objects and spatial models to convey perspective or interaction  
 Provide auditory cues for key concepts and transitions in visual information

4.1  
 Provide alternatives in the requirements for rate, timing, speed, and range of motor action required to interact with instructional materials, physical manipulatives, and technologies  
 Provide alternatives for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control)  
 Provide alternatives for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard

**Supporting Multilingual/English Learners**

**Related CELP standards:** **Learning Targets:**

K.1  
 An EL can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing

K.2:  
 An EL can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions

K1. I can, with prompting and supports, identify a few key words/attributes.

K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.

K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can echo my teacher’s melodic contour patterns	SC: I can correctly perform a matching melodic contour to that of my teacher	Feierabend Pitch Exploration Materials, Grade-level vocal repertoire
2	I can use my finger moving left to right and up and down to track the contour of a sound I hear	SC: I can trace my finger on the correct spot on the page as the pattern changes	Feierabend Pitch Exploration Materials, Grade-level vocal repertoire

3	I can perform a melodic contour using my high and low voice while following a pitch pathway map with my finger	SC: I can use a high or low voice as my finger changes up and down on a page.	Feierabend Pitch Exploration Materials, Grade-level vocal repertoire
4	I can improvise and create a simple melodic contour that I can recall	SC: I can use a siren voice to perform an original melodic contour that I can remember and repeat	Feierabend Pitch Exploration Materials, Grade-level vocal repertoire
5	I can use a moving line shape to notate a melodic contour I create	SC: I can change the height of my line on the page to show when my voice changes from high to low	Feierabend Pitch Exploration Materials, Grade-level vocal repertoire

**Unit Title:**

## TECHNIQUE: Rest, Ready, Perform

**Relevant Standards: Bold indicates priority**

**MU:Pr5.1.Ka - With guidance, apply personal, teacher, and peer feedback to refine performances**

MU:Pr6.1.Ka - With guidance, perform music with expression.

**MU:Pr6.1.Kb - Perform appropriately for the audience.**

**Essential Question(s):**

(MU:Pr5.1.K) How do musicians improve the quality of their performance?

(MU:Pr6.1.K) When is a performance judged ready to present? How do context and the manner in which musical work is presented influence audience response?

**Enduring Understanding(s):**

(MU:Pr5.1.K) To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria.

(MU:Pr6.1.K) Musicians judge performance based on criteria that vary across time, place, and cultures.

**Demonstration of Learning:**

Use of rest/ready/perform positions in performance  
Teacher assessed rest/ready/perform position checklist

**Pacing for Unit**

Full year

<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<p>When utilizing their classroom instruments, students will be expected to perform with appropriate instrumental techniques, including adjusting to musical moments such as resting, readiness, and performing.</p>	<p>Smartboard</p>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<p>Posture Rest position</p> <ul style="list-style-type: none"> <li>- “Backpack straps” or “Shoulder holders”</li> <li>- “Eggs by your legs, spoons in your bowl”</li> </ul> <p>Ready position</p> <ul style="list-style-type: none"> <li>- Pinch</li> <li>- wrap</li> </ul> <p>Perform position</p> <ul style="list-style-type: none"> <li>- “Handlebars” or “bicycle arms”</li> <li>- X shape</li> </ul>	<p>First Steps in Music, Conversational Solfege, other Kindergarten-level repertoire</p>
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Physical Education</p>	<ul style="list-style-type: none"> <li>● Students don’t know where to put their instruments/ mallets for rest position.</li> <li>● Students just stop.</li> <li>● Students go right from rest to perform.</li> <li>● Students do not rest at the correct time.</li> <li>● Students don’t go into ready position at the correct time.</li> <li>● Students don’t perform at the correct time.</li> <li>● Students don’t know where to put their instruments/ mallets for ready position.</li> <li>● Students do not play their instrument with correct playing technique.</li> </ul>
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
<p>Beat Dynamics Tempo Same/ Different Descriptive Music How Do Instruments Sound? Reading Left to Right Posture Matters</p>	<p>All future instrumental performance units</p>
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<p>Optimize relevance, value, and authenticity (checkpoint7.2)</p> <p>Maximize transfer and generalization (checkpoint3.4)</p>	<p>7.2: Vary activities and sources of information so that they can be: Personalized and contextualized to learners’ lives</p>

<p>Build fluencies with graduated levels of support for practice and performance (checkpoint5.3)</p>	<p>Culturally relevant and responsive          Socially relevant          Age and ability appropriate          Appropriate for different racial, cultural, ethnic, and gender groups</p> <p>Design activities so that learning outcomes are authentic, communicate to real audiences, and reflect a purpose that is clear to the participants</p> <p>3.4:          Provide checklists, organizers, sticky notes, electronic reminders          Prompt the use of mnemonic strategies and devices (e.g., visual imagery, paraphrasing strategies, method of loci, etc.)          Incorporate explicit opportunities for review and practice          Provide scaffolds that connect new information to prior knowledge (e.g., word webs, half-full concept maps)          Embed new ideas in familiar ideas and contexts (e.g., use of analogy, metaphor, drama, music, film, etc.)</p> <p>5.3:          Provide differentiated models to emulate (i.e. models that demonstrate the same outcomes but use differing approaches, strategies, skills, etc.)          Provide differentiated mentors (i.e., teachers/tutors who use different approaches to motivate, guide, feedback or inform)          Provide scaffolds that can be gradually released with increasing independence and skills (e.g., embedded into digital reading and writing software)          Provide differentiated feedback (e.g., feedback that is accessible because it can be customized to individual learners)</p>
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**Supporting Multilingual/English Learners**

<b>Related CELP standards:</b>	<b>Learning Targets:</b>
<p>K.1            An EL can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing</p> <p>K.2:            An EL can participate in grade appropriate oral and written exchanges of information, ideas, and analyses,</p>	<p>K1. I can, with prompting and supports, identify a few key words/attributes.</p> <p>K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.</p> <p>K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-</p>

responding to peer, audience, or reader comments and questions		questions.	
Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can match my teacher's three body and hand positions when holding my classroom instrument	SC: I can quietly hold my instrument like my teacher during rest, I can quietly support my instrument like my teacher when ready, I can perform using a correct technique like my teacher	Grade-level vocal and instrumental repertoire
2	I can describe what my body should do at rest, ready, and perform positions	SC: I can describe that a rest body is quiet and still, a ready body holds the instrument quietly with a proper hold, and a performing body is steady using a proper hold	Grade-level vocal and instrumental repertoire
3	I can independently use a classroom instrument in the rest, ready, and perform positions when prompted	SC: I can use my classroom instrument appropriately in the rest, ready, and perform positions when prompted	Grade-level vocal and instrumental repertoire
4	I can independently use a classroom instrument in the rest, ready, and perform positions automatically	SC: I can use my classroom instrument appropriately and automatically in the rest, ready, and perform positions	Grade-level vocal and instrumental repertoire

**Unit Title:**

## TECHNIQUE: Posture Matters!

**Relevant Standards: Bold indicates priority**

**MU:Pr5.1.Ka - With guidance, apply personal, teacher, and peer feedback to refine performances**

MU:Pr6.1.Ka - With guidance, perform music with expression.

**MU:Pr6.1.Kb - Perform appropriately for the audience.**

Essential Question(s):	Enduring Understanding(s):
<p><b>Pr5.1.Ka</b>How do musicians improve the quality of their performance?</p> <p>Pr6.1.KaWhen is a performance judged ready to present? How do context and the manner in which musical work is presented influence audience response?</p>	<p><b>Pr5.1.Ka</b>To express their musical ideas, musicians analyze, evaluate, and refine their performance over time through openness to new ideas, persistence, and the application of appropriate criteria.</p> <p>Pr6.1.KaMusicians judge performance based on criteria that vary across time, place, and cultures.</p>
Demonstration of Learning:	Pacing for Unit
<p>Use of posture in performance Teacher assessed posture checklist (Yes/No)</p>	<p>Full year</p>
Family Overview (link below)	Integration of Technology:
<p>When utilizing their singing voice, students will be expected to perform with appropriate vocal techniques, including their physical posture.</p>	<p>Smartboard</p>
Unit-specific Vocabulary:	Aligned Unit Materials, Resources, and Technology (beyond core resources):
<p>Posture Criss cross Tall back</p>	<p>First Steps in Music, Conversational Solfege, other Kindergarten-level repertoire</p>
Opportunities for Interdisciplinary Connections:	Anticipated misconceptions:
<p>Physical Education</p>	<p>W sitting or heel sitting instead of criss crossed, weight placed on hands or elbows instead of being spine supported</p>
Connections to Prior Units:	Connections to Future Units:
<p>Melodic Contour Dynamics Tempo Same Different I Sing, You Sing Four Voices One Voice or Many Voices Tracking Top to Bottom Rest Ready Perform</p>	<p>All future vocal performance units</p>
Differentiation through <a href="#">Universal Design for Learning</a>	
UDL Indicator	Teacher Actions:
<p>Optimize relevance, value, and authenticity (checkpoint7.2)</p> <p>Maximize transfer and generalization (checkpoint3.4)</p> <p>Build fluencies with graduated levels of support for practice and performance (checkpoint5.3)</p>	<p>7.2: Vary activities and sources of information so that they can be: Personalized and contextualized to learners' lives Culturally relevant and responsive Socially relevant Age and ability appropriate Appropriate for different racial, cultural, ethnic, and</p>

gender groups

Design activities so that learning outcomes are authentic, communicate to real audiences, and reflect a purpose that is clear to the participants

3.4:

Provide checklists, organizers, sticky notes, electronic reminders

Prompt the use of mnemonic strategies and devices (e.g., visual imagery, paraphrasing strategies, method of loci, etc.)

Incorporate explicit opportunities for review and practice

Provide scaffolds that connect new information to prior knowledge (e.g., word webs, half-full concept maps)

Embed new ideas in familiar ideas and contexts (e.g., use of analogy, metaphor, drama, music, film, etc.)

5.3:

Provide differentiated models to emulate (i.e. models that demonstrate the same outcomes but use differing approaches, strategies, skills, etc.)

Provide differentiated mentors (i.e., teachers/tutors who use different approaches to motivate, guide, feedback or inform)

Provide scaffolds that can be gradually released with increasing independence and skills (e.g., embedded into digital reading and writing software)

Provide differentiated feedback (e.g., feedback that is accessible because it can be customized to individual learners)

### Supporting Multilingual/English Learners

#### Related [CELP standards](#):

K.1  
An EL can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing

K.2:  
An EL can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions

#### Learning Targets:

K1. I can, with prompting and supports, identify a few key words/attributes.

K.2 I can, with prompting and supports, listen with occasional participation in short conversations using a limited number of words and phrases acquired in conversations and being read to.

K2. I can, with prompting and supports, respond verbally and nonverbally to simple yes/no and some wh-questions.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can match my teacher's body position when sitting or standing to sing	SC: I can sit criss cross with a tall back and stand tall with my arms by my	Grade-level vocal repertoire

		sides	
2	I can describe what my body should do when sitting or standing to sing	SC: I can describe that a sitting body is criss-crossed with a tall back, and a standing body is tall with my arms by my sides	Grade-level vocal repertoire
3	I can independently sit or stand in a proper singing position when prompted	SC: I can sit criss cross with a tall back while singing when asked , and stand tall with my arms by my sides when asked	Grade-level vocal repertoire
4	I can independently sit or stand in a proper singing position automatically when performing	SC: I can sit criss cross with a tall back while singing at all times, and stand tall with my arms by my sides when singing at all times	Grade-level vocal repertoire

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
UConn ECE Chemistry 1127Q and 1128Q	Science	10-12	2.0 BPS 1127Q: 4.0 UConn 1128Q: 4.0 UConn
<b>Course Description:</b>			
<p>This course enables students to undertake, in their first year, second-year work in the chemistry sequence at their institution or to register for courses in other fields where chemistry is a prerequisite. Students will attain a depth of understanding of fundamentals and competence in dealing with chemical problems.</p> <p>Through quantitative and qualitative analysis, students will gain a deeper understanding of matter, and how it changes. Major units of study include: Matter and change, solutions, gasses, heat, electronic structure of the atom, bonding, intermolecular forces, colligative properties, kinetics, equilibrium, thermodynamics, electrochemistry and nuclear chemistry. Through cooperative learning and lab experiences, students will improve communication and critical thinking skills.</p>			
<b>Aligned Core Resources:</b>		<b>Connection to the <i>BPS Vision of the Graduate</i></b>	
<b>Textbook</b> <i>Chemistry: The Central Science, 15th edition</i> Brown, LeMay, Bursten, Murphy, Woodward, Stoltzfus		<b>CONTENT MASTERY</b> <ul style="list-style-type: none"> <li>Develop and draw from a baseline understanding of knowledge in academic disciplines from our Bristol curriculum.</li> </ul>	
<b>Other</b> <ul style="list-style-type: none"> <li><a href="#">ChemQuiz.net</a> Autogenerated and customizable practice questions</li> <li><a href="#">PhET</a> Interactive simulations</li> <li><a href="#">The Organic Chemistry Tutor - YouTube</a> Chemistry tutorials at a college level</li> <li><a href="#">Khan Academy</a> Video tutorials, practice problems, and articles.</li> <li><a href="#">Chemistry 2e</a> Free online textbook</li> </ul>		<b>CRITICAL THINKING AND PROBLEM SOLVING</b> <ul style="list-style-type: none"> <li>Collect, assess and analyze relevant information</li> <li>Reason effectively. Use systems thinking.</li> <li>Make sound judgments and decisions. Identify, define and solve authentic problems and essential questions.</li> <li>Reflect critically on learning experience, processes and solutions.</li> <li>Transfer knowledge to other situations.</li> </ul>	
<b>Additional Course Information:</b>		<b>Link to <i>Completed Equity Audit</i></b>	
<b>Knowledge/Skill Dependent courses/prerequisites</b> <ul style="list-style-type: none"> <li>Must be enrolled in or have taken Algebra 2 ACC.</li> <li>Have an "83" average in Biology ACC or a "93" in Biology ACA.</li> <li>Students must be concurrently taking Pre-Calculus ACC or have the permission of the instructor.</li> <li>Grade 10 students may take concurrently with Biology ACC with teacher recommendation and an "83" average in Physical Science ACC.</li> </ul>		<a href="#">Equity Curriculum Review (ECE Chemistry 2024-25)</a>	
<b>Standard Matrix</b>			
Learning Objective 1: To explain and apply basic principles, definitions, laws and theories of chemistry Learning Objective 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically. Learning Objective 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation. Learning Objective 4: To develop logical analytical skills which can be used in real life problem solving and analysis			
Common Curriculum objective	Course student learning objective(s)	Course assessment(s)	
<ul style="list-style-type: none"> <li>LO-1 Students will be able to explain and appropriately utilize basic scientific language and concepts.</li> </ul>	<ul style="list-style-type: none"> <li>LO 1- To explain and apply basic principles, definitions, laws and theories of chemistry</li> </ul>	<ul style="list-style-type: none"> <li>Conceptual questions based on the first two domains of Bloom's taxonomy (remembering and understanding) on the exams</li> </ul>	
<ul style="list-style-type: none"> <li>LO-2 Students will be able to design or conduct an experiment or analysis suitable to test a</li> </ul>	<ul style="list-style-type: none"> <li>LO 3 - to develop laboratory skills and techniques along with data collection, data analysis and</li> </ul>	<ul style="list-style-type: none"> <li>Pre-lab quizzes, data analysis and conclusion reports submitted after every laboratory</li> </ul>	

<p>scientific hypothesis and be able to interpret the results.</p> <ul style="list-style-type: none"> <li>LO-1 Through application-based experiences utilizing the scientific method, students will be able to identify problems, make observations, analyze data, interpret data, and develop models or explanations</li> </ul>	<p>interpretation.</p>	<p>experiment. Required participation in scheduled laboratory activities in person.</p>
<ul style="list-style-type: none"> <li>LO-3 Students will be able to solve problems described verbally, graphically, symbolically, or numerically.</li> </ul>	<ul style="list-style-type: none"> <li>LO 2- To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically.</li> <li>LO 4- To develop logical analytical skills which can be used in real life problem solving and analysis</li> </ul>	<ul style="list-style-type: none"> <li>Open ended quantitative problems on the exams.</li> <li>Online Homework assignments.</li> <li>Higher-order comprehensive numerical problems on the exam and online homework. These problems cannot be directly solved by plugging values into a standard equation. Students must critically analyze the problem and combine multiple concepts in a logical manner to solve the problem.</li> </ul>

#### Unit Links

[Unit 1: Matter and Change \(1127\)](#)

[Unit 2: Solutions and Gasses \(1127\)](#)

[Unit 3: Heat, Electronic Structure of the Atom, and Bonding \(1127\)](#)

[Unit 4: Liquids and Solids \(1127\)](#)

[Unit 5: Colligative Properties and Kinetics \(1128\)](#)

[Unit 6: Concepts of Equilibrium \(1128\)](#)

[Unit 7: Solubility equilibria, Thermodynamics, and Electrochemistry \(1128\)](#)

[Unit 8: Nuclear Chemistry \(1128\)](#)

<b>Unit Title:</b>	
Unit 1: Matter and Change (1127)	
<b>Relevant Standards: Bold indicates priority</b>	
<b>LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry.</b>	
LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically.	
<b>LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation.</b>	
LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>• What is matter, and how is it classified?</li> <li>• What are the properties of matter, and how can they be measured?</li> <li>• How does matter change and transform?</li> <li>• What is the atomic structure of matter, and how does it relate to its properties?</li> <li>• How do we model and predict changes in matter?</li> </ul>	<ul style="list-style-type: none"> <li>• Matter exists in various forms and states, each characterized by distinct properties and behaviors.</li> <li>• Classification of matter into elements, compounds, and mixtures helps us understand its composition and structure.</li> <li>• Physical properties such as mass, volume, and density are intrinsic to matter and can be quantitatively measured.</li> <li>• Understanding and measuring these properties allow for characterization and comparison of different substances.</li> <li>• Matter undergoes physical changes (like phase changes) and chemical changes (like reactions) that alter its properties.</li> <li>• Changes in matter can be observed through indicators such as color change, temperature change, or formation of new substances.</li> <li>• Matter is composed of atoms, which combine to form molecules with specific chemical and physical properties.</li> <li>• The structure and arrangement of atoms and molecules dictate the macroscopic properties and behavior of matter.</li> <li>• Models, such as particle models and atomic models, provide frameworks for understanding and predicting the behavior of matter.</li> <li>• Knowledge of matter's properties and changes enables the application of scientific principles to real-world scenarios and phenomena.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• UConn provided exams</li> <li>• UConn provided labs</li> <li>• Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	<ul style="list-style-type: none"> <li>• <a href="#">Thin Layer Chromatography</a> simulation for chemical separation lab</li> <li>• Spectrophotometer (Colorimeter) for aspirin synthesis</li> </ul>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
Math Connection:	<ul style="list-style-type: none"> <li>• Matter is only something solid and visible.</li> </ul>

<ul style="list-style-type: none"> <li>Unit conversions and dimensional analysis with math classes</li> </ul> <p>Science Connection:</p> <ul style="list-style-type: none"> <li>Structure of an atom and the periodic table from physical science.</li> </ul>	<ul style="list-style-type: none"> <li>All matter can be classified in the same way.</li> <li>Properties like color, size, or texture are only observable, and cannot be measured scientifically.</li> <li>Mass and weight are the same.</li> <li>All changes in matter involve chemical reactions.</li> <li>Matter only changes when it is heated or cooled.</li> <li>Atoms are solid and indivisible particles.</li> <li>All atoms of an element are identical in their arrangement of subatomic particles.</li> <li>Changes in matter can always be predicted based on appearance or basic knowledge.</li> <li>Models of matter are always accurate representations of reality.</li> </ul>
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### Differentiation through *Universal Design for Learning*

#### UDL Indicator

#### Teacher Actions:

#### Representation:

*I can name and write formulas for compounds*

- Use diagrams and charts to illustrate chemical structures and formulas. This can include molecular models or flowcharts showing the naming conventions for compounds.
- Incorporate videos that demonstrate chemical reactions and the formation of compounds, allowing students to see the concepts in action.
- Provide written materials that include step-by-step guides for naming compounds, along with examples. Use clear, concise language and highlight key terms.

### Supporting Multilingual/English Learners

#### Related *CELP standards*:

#### Learning Targets:

#### **An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.**

*I can name and write formulas for compounds*

- Level 1: I can verbally describe the parts of a chemical formula
- Level 2: I can interpret and manipulate chemical formulas
- Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.
- Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.
- Level 5: I can synthesize information from multiple sources to solve real-world problems involving motion and explain my solutions effectively.

\*The CELP guidance is to **support the development of language**; access to course content expectations should not change as a result of MLL status.

Lesson Sequence	Learning Target	Success Criteria/Assessment/Resources
1	I can explain the concepts of matter, atoms, and molecules	<ul style="list-style-type: none"> <li>I can demonstrate how molecules and the atoms that compose them are represented by molecular models</li> <li>I can compare and contrast the different states of matter</li> <li>I can distinguish between elements compounds and mixture</li> </ul>
2	I can investigate the properties of matter	<ul style="list-style-type: none"> <li>I can distinguish between chemical and physical properties and changes.</li> <li>I can distinguish between intensive and extensive properties</li> <li>I can describe how filtration, distillation, and chromatography can be used to separate mixtures.</li> </ul>
3	I can measure and perform calculations according to the rules of uncertainty.	<ul style="list-style-type: none"> <li>I can convert between the 7 base units used in the metric system.</li> <li>I can convert between temperature units K, C, F</li> <li>I can interconvert among mass, volume and density</li> </ul>

		<ul style="list-style-type: none"> <li>• I can calculate energy in Joules</li> <li>• I can differentiate between exact and inexact numbers</li> <li>• I can explain the difference between accuracy and precision</li> <li>• I can demonstrate the use of significant figures in exponential notation and SI units in calculations</li> <li>• I can use dimensional analysis to perform calculations using conversion factors.</li> </ul>
4	I can investigate the formation of modern atomic structure	<ul style="list-style-type: none"> <li>• I can describe the structure of atoms</li> <li>• I can describe the historic discovery of atomic structure</li> <li>• I can describe early investigations to characterize the atom</li> </ul>
5	I can understand how to read and utilize the periodic table	<ul style="list-style-type: none"> <li>• I can describe and calculate the relationship between the atomic weight of an element, and the weights and abundances of a naturally occurring isotope of the same element.</li> <li>• I can infer an element's general properties from its location on the periodic table.</li> <li>• I can describe the differences between groups and periods.</li> <li>• I can relate an element's atomic number and atomic mass with the number of subatomic particles its atoms would contain.</li> </ul>
6	I can name and write formulas for compounds	<ul style="list-style-type: none"> <li>• I can name and write formulas for ions</li> <li>• I can write the formula for binary and ternary ionic compounds</li> <li>• I can name binary and ternary ionic compounds</li> <li>• I can write formulas for and name simple molecular compounds.</li> <li>• I can distinguish between molecular and empirical formulas.</li> </ul>
7	I can quantitatively study matter	<ul style="list-style-type: none"> <li>• I can calculate the molar mass of a compound and relate it to its formula weight.</li> <li>• I can define the mole is <math>6.022 \times 10^{23}</math></li> <li>• I can interconvert between grams, moles and molecules</li> <li>• I can calculate Empirical and Molecular formulas and percent composition of a compound</li> </ul>
8	I can understand chemical reactions in a quantitative manner	<ul style="list-style-type: none"> <li>• I can write and balance chemical equations</li> <li>• I can describe the proportional relationships between the substances involved in a chemical reaction.</li> <li>• I can describe and determine the limiting and excess reagents in a chemical reaction</li> <li>• I can perform calculations involving percent yield</li> </ul>

<b>Unit Title:</b>	
Unit 2: Solutions and Gasses (1127)	
<b>Relevant Standards: Bold indicates priority</b>	
LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry.	
<b>LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically.</b>	
LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation.	
LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>• What are solutions, and how do solutes interact with solvents?</li> <li>• How do we measure and describe the concentration of solutions?</li> <li>• What factors affect solubility, and how does it impact solution behavior?</li> <li>• What are the key properties of gasses, and how are they measured?</li> <li>• How do gas laws describe the behavior of gasses?</li> <li>• What factors influence the behavior of gasses, and what are their real-world applications?</li> </ul>	<ul style="list-style-type: none"> <li>• Solutions are mixtures where solutes dissolve in solvents to form homogeneous mixtures.</li> <li>• Concentration measures like molarity and percent composition describe how much solute is in a solution.</li> <li>• Solubility is influenced by temperature, pressure, and the nature of solute-solvent interactions.</li> <li>• Saturated, unsaturated, and supersaturated solutions have distinct stability and properties.</li> <li>• Gasses have properties like pressure, volume, and temperature, described by gas laws such as Boyle's, Charles's, and the Ideal Gas Law (<math>PV = nRT</math>).</li> <li>• Gas behavior is predictable under different conditions due to these laws.</li> <li>• Gasses diffuse rapidly and mix uniformly due to their high kinetic energy and lack of fixed volume or shape.</li> <li>• Understanding gas behavior is crucial in fields like meteorology, engineering, and environmental science.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• UConn provided exams</li> <li>• UConn provided labs</li> <li>• Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	<ul style="list-style-type: none"> <li>• pH probe and LabQuest device for gravimetric analysis lab</li> <li>• Pressure sensor and LabQuest device for gas behavior lab</li> </ul>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Math Connections:</p> <ul style="list-style-type: none"> <li>• Algebraic Relationships: Solving for variables in equations like the Ideal Gas Law uses skills from Algebra I and II (e.g., rearranging equations, working with formulas).</li> <li>• Ratios and Proportions: Calculating molarity and percent composition involves using ratios to express how much solute is present in a solution—aligned with standards in data analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Solutions are only formed by liquids dissolving in other liquids.</li> <li>• The solute is always completely dissolved in the solvent.</li> <li>• Solvents are always liquid.</li> <li>• Solute and solvents mix without any change in their properties.</li> <li>• Solubility is the same for all substances at any temperature.</li> </ul>

and problem solving. Science Connection: <ul style="list-style-type: none"> <li>Diffusion and Particle Motion: High school physics explores motion and forces—concepts that relate to how gas particles move and spread out quickly in open spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Gases do not have mass or volume.</li> </ul>
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**Differentiation through *Universal Design for Learning***

<b>UDL Indicator</b>	<b>Teacher Actions:</b>
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<b>Representation:</b> <i>I can describe the composition of solutions, qualitatively and quantitatively.</i> <ul style="list-style-type: none"> <li>Use diagrams and images to show different types of solutions (e.g., homogeneous vs. heterogeneous) and their components. This can include labeled diagrams illustrating solutes and solvents.</li> <li>Incorporate videos demonstrating how solutions are made, showing real-life examples of solutes dissolving in solvents, which can help students visualize the process.</li> <li>Provide written explanations with clear definitions of key terms such as "solute," "solvent," "concentration," and "dilution." Use straightforward language and highlight important concepts.</li> </ul>
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**Supporting Multilingual/English Learners**

<b>Related <i>CELP standards:</i></b>	<b>Learning Targets:</b>
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<b>An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.</b> <i>I can describe the composition of solutions, qualitatively and quantitatively.</i> <ul style="list-style-type: none"> <li>Level 1: I can verbally describe the parts of a solution</li> <li>Level 2: I can interpret and manipulate solutions</li> <li>Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.</li> <li>Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.</li> <li>Level 5: I can synthesize information from multiple sources to solve real-world problems involving solutions and explain my solutions effectively.</li> </ul>
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\*The *CELP* guidance is to **support the development of language**; access to course content expectations should not change as a result of MLL status.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can describe the composition of solutions, qualitatively and quantitatively.	<ul style="list-style-type: none"> <li>I can recognize that substances dissolved in water exist as ions, molecules or a mixture of the two.</li> <li>I can describe electrolytes and nonelectrolytes</li> <li>I can describe the concentration of particles in solution using units of molarity</li> <li>I can dilute a solution to create a new solution of known molarity</li> </ul>	
2	I can describe acid/base reactions	<ul style="list-style-type: none"> <li>I can explore reactions in which protons, H<sup>+</sup> ions are transferred from one reactant to another</li> <li>I can perform an acid/base titration to determine the concentration of a solution</li> </ul>	
3	I can describe precipitation reactions	<ul style="list-style-type: none"> <li>I can write complete and net ionic equations.</li> <li>I can define spectator ions.</li> <li>I can predict if two solutions will form a precipitate when mixed.</li> <li>I can perform stoichiometric calculations on precipitation reactions</li> </ul>	
4	I can describe oxidation and reduction reactions	<ul style="list-style-type: none"> <li>I can determine the oxidation numbers of elements in a compound</li> <li>I can identify which species are oxidized and reduced in a redox reaction. (and the oxidizing and reducing agents)</li> <li>I can write oxidations and reduction half reactions</li> </ul>	

		<ul style="list-style-type: none"> <li>I can write full redox equations in acidic and basic medium</li> </ul>
5	I can connect the kinetic molecular theory of gasses to the concept of pressure	<ul style="list-style-type: none"> <li>I can describe how the properties of gasses differ from those of solids and liquids</li> <li>I can define gas pressure and how manometers work,</li> <li>I can interconvert between units of pressure</li> </ul>
6	I can qualitatively and quantitatively use the gas laws	<ul style="list-style-type: none"> <li>I can define a direct and indirect relationship in reference to gas behavior</li> <li>I can relate the ideal gas law to Boyle's, Charle's, and Avogadro's Laws.</li> <li>I can use the ideal gas law to calculate any variable in the ideal gas equation.</li> <li>I can perform gas density and molar mass calculations</li> <li>I can explain avogadro's and molar volume at STP</li> <li>I can qualitatively and quantitatively describe gas mixtures using Dalton's Law of partial pressures</li> <li>I can qualitatively and quantitatively describe gas effusion and diffusion using Graham's Law.</li> </ul>

<b>Unit Title:</b>	
Unit 3: Heat, Electronic Structure of the Atom , and Bonding (1127)	
<b>Relevant Standards: Bold indicates priority</b>	
<b>LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry.</b>	
LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically.	
<b>LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation.</b>	
LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>• What is heat, and how does it transfer between objects or substances?</li> <li>• What factors influence the transfer of heat, and how is it measured?</li> <li>• How does heat energy affect the properties and states of matter?</li> <li>• What are the basic components of an atom, and how are they organized?</li> <li>• How do electrons occupy energy levels (shells) around the nucleus of an atom?</li> <li>• What determines the stability and reactivity of atoms based on their electron configurations?</li> <li>• What are chemical bonds, and how do atoms form bonds to become stable?</li> <li>• What are the differences between ionic, covalent, and metallic bonds?</li> <li>• How does the type of bonding affect the properties of substances, such as their strength, conductivity, and melting points?</li> </ul>	<ul style="list-style-type: none"> <li>• Heat is energy transferred between objects or substances due to temperature differences.</li> <li>• Heat transfer occurs through conduction, convection, and radiation.</li> <li>• Heat energy influences the physical properties and changes of matter, such as phase transitions and chemical reactions.</li> <li>• Atoms consist of a nucleus containing protons and neutrons, surrounded by electrons in energy levels (shells).</li> <li>• Electrons occupy specific energy levels and orbitals around the nucleus according to principles such as the Aufbau principle, Pauli exclusion principle, and Hund's rule.</li> <li>• The arrangement of electrons determines the chemical properties and reactivity of elements.</li> <li>• Chemical bonds form between atoms to achieve stability by filling electron shells or achieving a stable electron configuration.</li> <li>• Ionic bonds involve transfer of electrons between atoms, covalent bonds involve sharing of electrons, and metallic bonds involve a sea of delocalized electrons.</li> <li>• The type of bonding influences the properties of substances, including their strength, conductivity, and melting points.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• UConn provided exams</li> <li>• UConn provided labs</li> <li>• Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	<ul style="list-style-type: none"> <li>• Calorimeter and temperature probe for thermochemistry lab</li> <li>• Digital barometer for vapor pressure lab</li> </ul>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Math Connections:</p> <ul style="list-style-type: none"> <li>• Calorimetry Equation: Understanding and applying the calorimetry equation involves algebraic manipulation, reinforcing skills in solving equations and working with variables.</li> </ul>	<ul style="list-style-type: none"> <li>• Heat is the same as temperature.</li> <li>• Heat transfer only depends on the temperature difference between objects.</li> <li>• All substances change state at the same temperature.</li> </ul>

<ul style="list-style-type: none"> <li>Graph Interpretation: Determining if a reaction is endothermic or exothermic using data or graphs requires skills in data analysis and interpretation of visual information, linking math with scientific inquiry.</li> <li>Quantitative Descriptions: Describing relationships between speed, frequency, wavelength, and energy of light waves involves using formulas and calculations, which reinforces mathematical concepts such as ratios and direct proportionality.</li> </ul> <p>ELA Connection:</p> <ul style="list-style-type: none"> <li>Creating Lewis Structures: Writing out and explaining Lewis structures necessitates precise language use and can involve persuasive writing if students need to argue for the most favorable structure based on formal charge or resonance.</li> </ul>	<ul style="list-style-type: none"> <li>Electrons are located on the surface of atoms.</li> <li>Electrons orbit the nucleus in fixed paths.</li> <li>All bonds are identical in strength.</li> </ul>
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**Differentiation through *Universal Design for Learning***

<b>UDL Indicator</b>	<b>Teacher Actions:</b>
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**Representation:**  
*I can use the Bohr model and quantum mechanical model of the atom.*

- Use diagrams and illustrations of both the Bohr model and quantum mechanical model. Include labeled parts to highlight key features, such as energy levels in the Bohr model and electron clouds in the quantum model.
- Incorporate videos and animations that explain both models, demonstrating how electrons behave in each model, and showcasing their historical context and development.
- Provide clear, concise written descriptions of both models, emphasizing their differences and similarities. Use bullet points or tables to compare key features.

**Supporting Multilingual/English Learners**

<b>Related <i>CELP standards:</i></b>	<b>Learning Targets:</b>
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**An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.**  
*I can use the Bohr model and quantum mechanical model of the atom.*

- Level 1: I can verbally describe the parts of an atom
- Level 2: I can interpret and manipulate atomic models
- Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.
- Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.
- Level 5: I can synthesize information from multiple sources to solve real-world problems involving more modern models of the atom (quantum mechanical model) and explain my solutions effectively.

*\*The CELP guidance is to **support the development of language**; access to course content expectations should not change as a result of MLL status.*

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can use calorimetry concepts to study the heat of a chemical reaction	<ul style="list-style-type: none"> <li>I can define heat as a measurement of energy, and distinguish it from temperature</li> <li>I can use the calorimetry equation to solve for any of its equations.</li> <li>I can determine, from data or from a graph, if a reaction is endothermic or exothermic</li> </ul>	
2	I can use Hess's law	<ul style="list-style-type: none"> <li>I can describe the enthalpy of formation from the enthalpy of reaction.</li> <li>I can calculate the enthalpy of a reaction using the enthalpy of formation values.</li> </ul>	
3	I can describe the wave nature of light	<ul style="list-style-type: none"> <li>I can qualitatively and quantitatively describe the relationship between the speed frequency and wavelength and energy of the light waves</li> </ul>	

		<ul style="list-style-type: none"> <li>I can describe the electromagnetic spectrum and order the waves based on energy</li> </ul>
4	I can use the Bohr model and quantum mechanical model of the atom.	<ul style="list-style-type: none"> <li>I can describe electronic transitions and qualitatively and quantitatively predict properties of light emitted or absorbed</li> <li>I can state the name, symbols, and allowed combinations of quantum numbers</li> <li>I can determine the electron configuration (including abbreviated and orbital diagrams) for any atom or ion on the periodic table</li> <li>I can predict atomic radius, electronegativity, electron affinity, ion size, and ionization energy for an element based on its periodic table location.</li> </ul>
5	I can describe the structure and bonding of covalent compounds	<ul style="list-style-type: none"> <li>I can describe the types of atoms that participate in covalent bonding.</li> <li>I can use electronegativity to describe bond polarity and dipole moments.</li> <li>I can describe the polarity and partial ionic character of a covalent bond</li> </ul>
6	I can create and evaluate Lewis structures	<ul style="list-style-type: none"> <li>I can use the total number of valence electrons in a formula and the octet rule to determine the appropriate lewis structure</li> <li>I can create Lewis structures for compounds that are exceptions to the octet rule.</li> <li>I can calculate formal charge and use it to determine the more likely structure.</li> <li>I can describe the concept of resonance</li> </ul>
7	I can describe the geometry of covalent compounds.	<ul style="list-style-type: none"> <li>I can describe VSEPR theory</li> <li>I can use VSEPR theory to predict and name, shapes,, bond angles, and hybridization</li> <li>I can differentiate between pi and sigma bonds</li> </ul>

<b>Unit Title:</b>	
Unit 4: Liquids and Solids (1127)	
<b>Relevant Standards: Bold indicates priority</b>	
LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry. LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically. LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation. <b>LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>• What are intermolecular forces, and how do they affect the properties of substances?</li> <li>• What are the different types of intermolecular forces (e.g., London dispersion forces, dipole-dipole interactions, hydrogen bonding)?</li> <li>• How do intermolecular forces influence physical properties such as boiling point, melting point, and solubility?</li> </ul>	<ul style="list-style-type: none"> <li>• Intermolecular forces are attractive forces between molecules that determine their physical state and behavior.</li> <li>• London dispersion forces arise from temporary fluctuations in electron distribution and exist between all molecules.</li> <li>• Dipole-dipole interactions occur between polar molecules due to permanent dipoles.</li> <li>• Hydrogen bonding is a special type of dipole-dipole interaction where hydrogen atoms bonded to highly electronegative atoms (such as nitrogen, oxygen, or fluorine) exhibit a strong attraction to lone pairs on neighboring molecules.</li> <li>• Intermolecular forces increase with molecular size and polarity, affecting properties such as boiling point (higher forces require more energy to overcome), melting point, and solubility (like dissolves like principle).</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• UConn provided exams</li> <li>• UConn provided labs</li> <li>• Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	N/A
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Math Connection:</p> <ul style="list-style-type: none"> <li>• Quantitative Relationships: Relating vapor pressure to the heat of vaporization using the Clausius-Clapeyron equation involves algebraic manipulation and logarithmic calculations, enhancing students' skills in applying mathematical concepts to real-world scenarios.</li> </ul> <p>ELA Connection:</p> <ul style="list-style-type: none"> <li>• Descriptive Writing: Describing hydrogen bonding and differentiating between bond and molecular polarity require students to articulate complex scientific concepts succinctly, enhancing their descriptive writing skills.</li> </ul>	<ul style="list-style-type: none"> <li>• Intermolecular forces are the same as chemical bonds.</li> <li>• All intermolecular forces are equally strong.</li> </ul>
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	

UDL Indicator		Teacher Actions:	
<b>Representation:</b> <i>I can relate Intermolecular forces of attraction to physical properties and molecular structures.</i> <ul style="list-style-type: none"> <li>Use diagrams and charts to illustrate different types of intermolecular forces (e.g., hydrogen bonding, dipole-dipole interactions, London dispersion forces) and how they relate to molecular structures and physical properties like boiling point, melting point, and solubility.</li> <li>Incorporate videos that explain intermolecular forces, showcasing real-life examples of how these forces affect the properties of substances, such as the behavior of water versus oil.</li> <li>Provide written explanations that define key terms and concepts, using clear and straightforward language. Include examples that connect intermolecular forces to observable physical properties.</li> </ul>			
Supporting Multilingual/English Learners			
Related <u>CELP standards:</u>		Learning Targets:	
<b>An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.</b> <i>I can relate Intermolecular forces of attraction to physical properties and molecular structures.</i> <ul style="list-style-type: none"> <li>Level 1: I can verbally describe intermolecular forces</li> <li>Level 2: I can interpret and manipulate molecular structures</li> <li>Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.</li> <li>Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.</li> <li>Level 5: I can synthesize information from multiple sources to solve real-world problems involving IMFs and their effect on physical properties, and explain my solutions effectively.</li> </ul> <p><i>*The CELP guidance is to <b>support the development of language</b>; access to course content expectations should not change as a result of MLL status.</i></p>			
Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can relate Intermolecular forces of attraction to physical properties and molecular structures.	<ul style="list-style-type: none"> <li>I can differentiate between bond and molecular polarity</li> <li>I can use bond polarity and molecular geometry to determine the polarity of the molecule.</li> <li>I can compare the strength of intermolecular forces given different structures</li> <li>I can describe hydrogen bonding</li> <li>I can relate intermolecular forces to freezing point, boiling point, melting point, and vapor pressure.</li> <li>I can quantitatively relate vapor pressure to the heat of vaporization using the Clausius-Clapeyron</li> <li>I can read and interpret phase diagrams</li> </ul>	

<b>Unit Title:</b>	
Unit 5: Colligative Properties and Kinetics (1128)	
<b>Relevant Standards: Bold indicates priority</b>	
LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry. LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically. <b>LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation.</b> <b>LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>What are colligative properties, and how do they depend on the number of solute particles in a solution?</li> <li>What are the common colligative properties (e.g., vapor pressure lowering, boiling point elevation, freezing point depression), and how are they calculated?</li> <li>How do colligative properties affect practical applications, such as in freezing point depression in antifreeze or boiling point elevation in cooking?</li> <li>What is chemical kinetics, and how does it relate to reaction rates?</li> <li>What factors influence the rate of chemical reactions (e.g., concentration, temperature, catalysts)?</li> <li>How are reaction mechanisms and rate laws used to describe and predict reaction rates?</li> </ul>	<ul style="list-style-type: none"> <li>Colligative properties depend solely on the number of solute particles present, not on their identity.</li> <li>Vapor pressure lowering, boiling point elevation, and freezing point depression are directly proportional to the solute concentration in a solution.</li> <li>Colligative properties are important in various industrial and everyday applications, such as in pharmaceuticals, food science, and automotive fluids</li> <li>Chemical kinetics studies the speed at which chemical reactions occur and the factors that influence reaction rates.</li> <li>Reaction rates increase with higher concentrations of reactants, higher temperatures, and the presence of catalysts.</li> <li>Rate laws and reaction mechanisms describe how reactants transform into products over time, providing insights into reaction pathways and controlling reaction rates in practical applications.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>UConn provided exams</li> <li>UConn provided labs</li> <li>Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	N/A
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Math Connections:</p> <ul style="list-style-type: none"> <li>Calculations of Concentration: Expressing concentrations using mole fraction and molality involves mathematical calculations, reinforcing skills in ratios and proportions, which are fundamental in solving real-world problems in chemistry.</li> <li>Equations and Graphing: Using mathematical equations to describe colligative effects, such as the van't Hoff factor, requires students to perform algebraic manipulations and graph relationships between variables like solute concentration and boiling point.</li> </ul>	<ul style="list-style-type: none"> <li>Boiling point elevation and freezing point depression only occur with ionic solutes, not molecular ones.</li> <li>Adding more solute always results in a greater change in freezing or boiling points.</li> <li>Colligative properties only have an impact in extreme conditions, not in everyday life.</li> <li>Chemical kinetics is only concerned with the speed of reactions, not with the factors influencing it.</li> <li>Reaction rates only depend on temperature and not on other factors such as concentration or catalysts.</li> <li>Catalysts change the equilibrium of a reaction.</li> <li>The rate law is only relevant for complex reactions, not for simple ones.</li> </ul>

<ul style="list-style-type: none"> <li>Reaction Rate Calculations: Calculating reaction rates from experimental data involves applying statistical analysis and understanding rates of change, emphasizing the importance of quantitative reasoning in scientific inquiry.</li> </ul> <p>ELA Connection:</p> <ul style="list-style-type: none"> <li>Descriptive Explanations: Explaining why some solutions produce or absorb heat when they form requires students to articulate complex scientific concepts clearly, enhancing their ability to write detailed and coherent explanations.</li> </ul>	
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**Differentiation through *Universal Design for Learning***

<b>UDL Indicator</b>	<b>Teacher Actions:</b>
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**Representation:**

*I can use rate and concentration data to identify reaction orders and derive rate laws.*

- Use graphs to illustrate how concentration changes over time during a reaction. Different reaction orders can be represented visually (e.g., linear graphs for first-order reactions) to highlight the relationship between concentration and reaction rate.
- Incorporate videos that demonstrate the process of analyzing rate and concentration data, including examples of how to identify reaction orders and derive rate laws from experimental results.
- Use simulations that allow students to manipulate concentration values and observe the effects on reaction rates and graphs, providing a hands-on understanding of the concepts.

**Supporting Multilingual/English Learners**

<b>Related <i>CELP standards:</i></b>	<b>Learning Targets:</b>
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**An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.**

*I can use rate and concentration data to identify reaction orders and derive rate laws*

- Level 1: I can verbally describe what is meant by rate of a chemical reaction
- Level 2: I can interpret data to determine rate laws
- Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.
- Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.
- Level 5: I can synthesize information from multiple sources to solve real-world problems involving reaction rates and rate laws and explain my solutions effectively.

\*The CELP guidance is to **support the development of language**; access to course content expectations should not change as a result of MLL status.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can describe the basic properties of solutions and how they form	<ul style="list-style-type: none"> <li>Predict whether a given mixture will yield a solution based on molecular properties of its components</li> <li>I can explain why some solutions either produce or absorb heat when they form</li> <li>I can define and give examples of electrolytes</li> <li>I can distinguish between the physical and chemical changes that accompany dissolution of ionic and covalent electrolytes</li> <li>I can relate electrolyte strength to solute-solvent attractive forces</li> <li>I can describe the effects of temperature and pressure on solubility</li> <li>I can state Henry's law and use it in calculations involving the solubility of a gas in a liquid</li> <li>I can describe the idea of "like dissolves like"</li> <li>I can use the term miscible appropriately</li> </ul>	

2	I can qualitatively and quantitatively describe the colligative properties of solutions	<ul style="list-style-type: none"> <li>• I can express concentrations of solution components using mole fraction and molality</li> <li>• I can describe the effect of solute concentration on various solution properties (vapor pressure, boiling point, freezing point, and osmotic pressure)</li> <li>• I can perform calculations using the mathematical equations that describe these various colligative effects, including the van't Hoff factor</li> <li>• I can describe the process of distillation and its practical applications</li> <li>• I explain the process of osmosis</li> </ul>
3	I can calculate and describe how to manipulate reaction rates	<ul style="list-style-type: none"> <li>• I can define chemical reaction rate</li> <li>• I can derive rates from the balanced equation for a given chemical reaction</li> <li>• I can calculate reaction rates from experimental data</li> <li>• I can describe and explain using collision theory the effects of chemical nature, physical state, temperature, concentration, and catalysis on reaction rates</li> <li>• I can define the concepts of activation energy and transition states, and relate them to a potential energy graph</li> <li>• I can use the Arrhenius equation in calculations</li> </ul>
4	I can determine and utilize the rate law and the integrated rate law of a reaction	<ul style="list-style-type: none"> <li>• I can explain the form and function of a rate law</li> <li>• I can use rate laws to calculate reaction rates</li> <li>• I can use rate and concentration data to identify reaction orders and derive rate laws</li> <li>• I can explain the form and function of an integrated rate law</li> <li>• I can perform integrated rate law calculations for zero-, first-, and second-order reactions</li> <li>• I can define half-life and carry out related calculations</li> <li>• I can identify the order of a reaction from concentration/time data</li> </ul>

<b>Unit Title:</b>	
Unit 6: Concepts of Equilibrium (1128)	
<b>Relevant Standards: Bold indicates priority</b>	
LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry.	
<b>LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically.</b>	
LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation.	
LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>• What is chemical equilibrium?</li> <li>• How do we express equilibrium in terms of the equilibrium constant (K)?</li> <li>• What factors affect the position of equilibrium?</li> <li>• How do we calculate equilibrium concentrations or pressures?</li> <li>• How does equilibrium relate to acids and bases?</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical equilibrium is a dynamic state where the rate of the forward reaction equals the rate of the reverse reaction, resulting in no net change in the concentrations of reactants and products over time.</li> <li>• The equilibrium constant (K) expresses the ratio of product concentrations (or partial pressures) to reactant concentrations (or partial pressures) at equilibrium, with each raised to the power of their respective stoichiometric coefficients.</li> <li>• Factors such as concentration, pressure (for gasses), and temperature influence the position of equilibrium according to Le Chatelier's Principle.</li> <li>• Equilibrium concentrations (or pressures) can be calculated using the equilibrium expression and known initial conditions of reactants and products.</li> <li>• Equilibrium concepts apply to acids and bases through the acid dissociation constant <math>K_a</math> and base dissociation constant <math>K_b</math> which quantify the strength of acids and bases in aqueous solutions.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• UConn provided exams</li> <li>• UConn provided labs</li> <li>• Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	<ul style="list-style-type: none"> <li>• LabQuest and SpectroVis for K of a chemical reaction lab</li> <li>• LabQuest and pH probe for pH measurements lab</li> </ul>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Math Connections:</p> <ul style="list-style-type: none"> <li>• Equilibrium Calculations: Calculating equilibrium concentrations and constants involves algebraic manipulations and applying mathematical formulas, reinforcing students' skills in solving equations and working with variables.</li> <li>• Reaction Quotient and Equilibrium Expressions: Deriving expressions for reaction quotients and equilibrium constants requires understanding ratios and exponents, which enhances students' mathematical reasoning and comprehension of proportional relationships.</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical equilibrium means that the concentrations of reactants and products are equal.</li> <li>• At equilibrium, the reaction stops and no further changes occur.</li> <li>• Chemical equilibrium is a one-time event, rather than a dynamic process.</li> <li>• The equilibrium constant (K) is always the same, regardless of temperature or pressure.</li> <li>• Only changes in concentration can affect the position of equilibrium.</li> <li>• The equilibrium constant and rate constant are the same.</li> </ul>

<ul style="list-style-type: none"> <li>pH Calculations: Calculating the pH of buffer solutions and performing titration calculations involves logarithmic functions and understanding concentration, providing practical applications of math in chemistry.</li> </ul> <p>ELA Connection:</p> <ul style="list-style-type: none"> <li>Technical Documentation: Writing equations for acid and base ionization reactions and discussing the behavior of amphiprotic substances helps students develop their ability to document scientific processes accurately, enhancing their technical writing skills.</li> </ul>	<ul style="list-style-type: none"> <li>Acids and bases do not reach equilibrium in water because they dissociate completely.</li> </ul>
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### Differentiation through *Universal Design for Learning*

UDL Indicator	Teacher Actions:
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#### Representation:

*I can interpret titration curves for strong and weak acid-base systems and compute sample pH at important stages of a titration.*

- Provide clear, labeled graphs of titration curves for strong and weak acids, illustrating the changes in pH at different stages of the titration. Highlight key points such as the equivalence point, buffer region, and initial and final pH values.
- Use diagrams to depict the chemical reactions occurring during titration, showing how the acid and base interact and change in concentration.
- Incorporate videos that explain titration processes, including how to read titration curves and how to calculate pH at various stages. Visual demonstrations can enhance understanding of the concepts.

### Supporting Multilingual/English Learners

Related <i>CELP standards</i> :	Learning Targets:
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#### An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.

*I can interpret titration curves for strong and weak acid-base systems and compute sample pH at important stages of a titration.*

- Level 1: I can verbally describe the parts of a titration curve
- Level 2: I can interpret and manipulate the graph to match specific titrations
- Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.
- Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.
- Level 5: I can synthesize information from multiple sources to solve real-world problems involving titration curves and explain my solutions effectively.

\*The CELP guidance is to **support the development of language**; access to course content expectations should not change as a result of MLL status.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can qualitatively and quantitatively describe reversible chemical reactions	<ul style="list-style-type: none"> <li>I can describe the reversible and dynamic nature of equilibrium systems</li> <li>I can derive expressions for reaction quotients and equilibrium expressions</li> <li>I can calculate values of reaction quotients and equilibrium constants, using concentrations and pressures</li> <li>I can relate the magnitude of an equilibrium constant to properties of the chemical system</li> <li>I can describe the ways in which an equilibrium system can be stressed</li> <li>I can predict the response of a stressed equilibrium using Le Châtelier's principle</li> </ul>	

		<ul style="list-style-type: none"> <li>• I can identify the changes in concentration or pressure that occur for chemical species in equilibrium systems when a stress is applied.</li> <li>• I can calculate equilibrium concentrations or pressures and equilibrium constants, using various algebraic approaches</li> </ul>
2	I can qualitatively and quantitatively describe acid base equilibria	<ul style="list-style-type: none"> <li>• I can identify acids, bases, and conjugate acid-base pairs according to the Brønsted-Lowry and Lewis definitions.</li> <li>• I can write equations for acid and base ionization reactions</li> <li>• I can describe the acid-base behavior of amphiprotic substances</li> <li>• I can assess the relative strengths of acids and bases according to their ionization constants</li> <li>• I can rationalize trends in acid-base strength in relation to molecular structure*</li> <li>• Carry out equilibrium calculations for weak acid-base systems</li> <li>• I can predict whether a salt solution will be acidic, basic, or neutral</li> <li>• I can extend previously introduced equilibrium concepts to acids and bases that may donate or accept more than one proton</li> </ul>
3	I can perform acid-base titrations(including weak acids and bases) and qualitatively and quantitatively explain the concept of buffers	<ul style="list-style-type: none"> <li>• I can describe the composition and function of acid-base buffers</li> <li>• I can calculate the pH of a buffer before and after the addition of added acid or base</li> <li>• I can interpret titration curves for strong and weak acid-base systems</li> <li>• I can compute sample pH at important stages of a titration</li> <li>• I can explain the function of acid-base indicators and choose appropriate indicators for particular acid base titrations.</li> <li>• I can describe how the presence of a common ion will effect an acid /base solutions</li> <li>• I can understand the concept of buffer capacity</li> </ul>

<b>Unit Title:</b>	
Unit 7: Solubility equilibria, Thermodynamics, and Electrochemistry (1128)	
<b>Relevant Standards: Bold indicates priority</b>	
<b>LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry.</b>	
LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically.	
<b>LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation.</b>	
LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>• What factors affect the solubility of a compound in a solvent?</li> <li>• How do we express the solubility of a compound in quantitative terms?</li> <li>• How do we calculate the solubility of a compound given its <math>K_{sp}</math>?</li> <li>• How does Le Chatelier's Principle apply to solubility equilibria?</li> <li>• What is the fundamental concept of thermodynamics?</li> <li>• How do we calculate changes in internal energy, enthalpy, and entropy?</li> <li>• What is Gibbs free energy (<math>\Delta G</math>) and how is it used to predict spontaneity?</li> <li>• How does thermodynamics apply to phase equilibria and chemical equilibria?</li> <li>• What are redox reactions, and how are they represented?</li> <li>• How do we measure the spontaneity and extent of redox reactions?</li> <li>• What is the relationship between <math>\Delta G</math> and <math>E_{cell}</math>?</li> <li>• What are galvanic cells?</li> </ul>	<ul style="list-style-type: none"> <li>• Solubility of a compound in a solvent is influenced by temperature, pressure (for gasses), pH, and the presence of common ions.</li> <li>• Solubility can be expressed quantitatively</li> <li>• Le Chatelier's Principle predicts how changes in concentration, temperature, or pressure affect solubility equilibrium.</li> <li>• Thermodynamics deals with energy transformations within a system and between the system and its surroundings.</li> <li>• Gibbs free energy (<math>\Delta G</math>) quantifies the spontaneity of a process; <math>\Delta G &lt; 0</math> indicates spontaneity under standard conditions.</li> <li>• <math>\Delta G</math> helps predict the feasibility of reactions and phase changes at constant temperature and pressure</li> <li>• Redox reactions involve electron transfer between species, where oxidation involves loss of electrons and reduction involves gain.</li> <li>• <math>\Delta G = -nFE_{cell}</math></li> <li>• Galvanic cells (electrochemical cells) convert chemical energy into electrical energy through redox reactions</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• UConn provided exams</li> <li>• UConn provided labs</li> <li>• Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	<ul style="list-style-type: none"> <li>• LabQuest and temperature probe for thermodynamic measurements lab.</li> <li>• Labquest and voltage meter for voltaic cell lab</li> </ul>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Math Connections:</p> <ul style="list-style-type: none"> <li>• Equilibrium Computations: Carrying out equilibrium computations involving solubility, equilibrium expressions, and solute concentrations requires algebraic manipulation and understanding of ratios, reinforcing students' mathematical skills in solving equations.</li> <li>• Entropy and Free Energy Calculations: Calculating</li> </ul>	<ul style="list-style-type: none"> <li>• Balancing chemical equations is simply about having the same number of atoms on each side, without understanding the conservation of mass and charge.</li> <li>• Misunderstand the common ion effect, thinking that the presence of a common ion always increases solubility, rather than recognizing that it can actually decrease solubility for certain salts.</li> <li>• Confuse entropy with disorder and think that a</li> </ul>

<p>entropy changes for phase transitions and chemical reactions, as well as calculating free energy changes using formation values, involves applying mathematical formulas and principles, enhancing quantitative reasoning.</p> <ul style="list-style-type: none"> <li>Nernst Equation: Using the Nernst equation to determine cell potentials under nonstandard conditions involves logarithmic calculations, emphasizing the application of math in real-world chemistry scenarios.</li> </ul> <p>ELA Connection:</p> <ul style="list-style-type: none"> <li>Technical Writing Skills: Writing chemical equations and equilibrium expressions necessitates careful attention to detail and accuracy in scientific notation, enhancing students' technical writing skills.</li> </ul>	<p>process with higher entropy is always "messier," not understanding that it is a measure of the number of microstates and energy dispersal.</p> <ul style="list-style-type: none"> <li>Believe that spontaneity means a reaction occurs quickly, rather than understanding that it refers to the thermodynamic favorability of a reaction.</li> <li>That electrode mass increases at both the anode and cathode, not realizing that oxidation occurs at the anode (mass decreases) and reduction occurs at the cathode (mass increases).</li> <li>That standard cell potentials apply in all conditions without considering the effects of concentration and temperature, leading to confusion when applying the Nernst equation.</li> </ul>
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### Differentiation through [Universal Design for Learning](#)

#### UDL Indicator

#### Teacher Actions:

#### Representation:

*I can carry out equilibrium computations involving solubility, equilibrium expressions, and solute concentrations.*

- Use diagrams to illustrate the concept of chemical equilibrium, showing the forward and reverse reactions, along with visual representations of solubility products and concentration changes.
- Create flowcharts that outline the steps for calculating solubility, equilibrium expressions, and solute concentrations, making the process clearer and more accessible.
- Incorporate videos that explain equilibrium concepts, including solubility and the calculation of equilibrium expressions. Visual aids can help clarify complex ideas and computations.

### Supporting Multilingual/English Learners

#### Related [CELP standards:](#)

#### Learning Targets:

#### **An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.**

*I can carry out equilibrium computations involving solubility, equilibrium expressions, and solute concentrations.*

- Level 1: I can verbally describe a saturated solution
- Level 2: I can interpret and manipulate the  $K_{sp}$  expression
- Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.
- Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.
- Level 5: I can synthesize information from multiple sources to solve real-world problems involving  $K_{sp}$  and saturated solutions and explain my solutions effectively.

\*The CELP guidance is to **support the development of language**; access to course content expectations should not change as a result of MLL status.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can qualitatively and quantitatively describe the equilibria of saturated solutions	<ul style="list-style-type: none"> <li>I can write chemical equations and equilibrium expressions representing solubility equilibria</li> <li>I can carry out equilibrium computations involving solubility, equilibrium expressions, and solute concentrations</li> <li>I can qualitatively and quantitatively describe how the presence of a common ion will affect the solubility of a salt.</li> <li>I can use <math>K_{sp}</math> to predict precipitation.</li> </ul>	
2	I can qualitatively and quantitatively describe entropy, and gibbs free energy.	<ul style="list-style-type: none"> <li>I can distinguish between spontaneous and nonspontaneous processes</li> <li>I can differentiate between order and disorder</li> <li>I can define entropy</li> </ul>	

		<ul style="list-style-type: none"> <li>• I can explain the relationship between entropy and the number of microstates</li> <li>• I can predict the sign of the entropy change (both system and surroundings) for chemical and physical processes</li> <li>• I can state and explain the second and third laws of thermodynamics</li> <li>• I can calculate entropy changes for phase transitions and chemical reactions under standard conditions</li> <li>• I can define Gibbs free energy, and describe its relation to spontaneity</li> <li>• I can calculate free energy change for a process using free energies of formation for its reactants and products</li> <li>• I can calculate free energy change for a process using enthalpies of formation and the entropies for its reactants and products</li> <li>• I can explain how temperature affects the spontaneity of some processes</li> <li>• I can relate standard free energy changes to equilibrium constants</li> </ul>
3	I can qualitatively and quantitatively describe electrochemistry	<ul style="list-style-type: none"> <li>• I can describe defining traits of redox chemistry</li> <li>• I can identify what has been oxidized/reduced/oxidizing agent / reducing agent.</li> <li>• I can balance chemical equations for redox reactions using the half-reaction method</li> <li>• I can describe the function of a galvanic cell and its components, and any changes in electrode mass</li> <li>• I can use cell notation to symbolize the composition and construction of galvanic cells</li> <li>• I can describe and relate the definitions of electrode and cell potentials</li> <li>• I can calculate cell potentials</li> <li>• I can qualitatively and quantitatively explain the relations between potential, free energy change, and equilibrium constants</li> <li>• I can use the Nernst equation to determine cell potentials under nonstandard conditions</li> <li>• I can describe the process of electrolysis</li> <li>• I can perform stoichiometric calculations for electrolytic processes</li> </ul>

<b>Unit Title:</b>	
Unit 8: Nuclear Chemistry (1128)	
<b>Relevant Standards: Bold indicates priority</b>	
<b>LO 1: To explain and apply basic principles, definitions, laws and theories of chemistry.</b>	
<b>LO 2: To apply basic principles to solve real world problems described verbally, graphically, symbolically or numerically.</b>	
<b>LO 3: To develop laboratory skills and techniques along with data collection, data analysis and interpretation.</b>	
LO 4: To develop logical analytical skills which can be used in real life problem solving and analysis.	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ul style="list-style-type: none"> <li>• What is radioactivity, and what causes it?</li> <li>• How do we quantify radioactive decay?</li> <li>• What factors influence nuclear stability?</li> <li>• What are nuclear reactions, and how do they differ from chemical reactions?</li> </ul>	<ul style="list-style-type: none"> <li>• Radioactivity arises from the instability of atomic nuclei, leading to the emission of radiation in the form of alpha particles, beta particles, and gamma rays.</li> <li>• Radioactive decay follows exponential decay kinetics described by the decay laws</li> <li>• Nuclear stability is influenced by the balance between nuclear forces (strong force binding protons and neutrons) and the electrostatic repulsion between protons (Coulomb force)</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• UConn provided exams</li> <li>• UConn provided labs</li> <li>• Teacher created assignments</li> </ul>	Approximately 20 classes
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview ECE Chemistry</a>	N/A
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<a href="#">Unit Specific Vocabulary ECE Chemistry</a>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Math Connections:</p> <ul style="list-style-type: none"> <li>• Calculating Mass Defect and Binding Energy: Calculating mass defect and binding energy for nuclei involves applying mathematical formulas and performing unit conversions, reinforcing students' skills in quantitative reasoning and algebra.</li> <li>• Kinetic Parameters: Calculating half-life and other kinetic parameters for decay processes requires an understanding of exponential functions and logarithms, illustrating the mathematical principles behind radioactive decay.</li> <li>• Balancing Nuclear Equations: Writing and balancing nuclear equations necessitates an understanding of conservation laws and numerical relationships, enhancing students' abilities in algebraic manipulation and problem-solving.</li> </ul> <p>ELA Connections:</p> <ul style="list-style-type: none"> <li>• Descriptive Writing: Describing nuclear structure in terms of protons, neutrons, and electrons requires clear and precise language, helping students develop their ability to convey complex</li> </ul>	<ul style="list-style-type: none"> <li>• Think that binding energy is always a positive quantity and do not recognize that it represents the energy required to disassemble a nucleus into its individual protons and neutrons.</li> <li>• Believe that all radioactive decay processes are the same, failing to recognize the differences between alpha decay, beta decay, and gamma decay, and their respective characteristics.</li> <li>• Have difficulty writing or balancing decay equations, believing they can ignore the conservation of mass and charge, leading to incorrect representations of nuclear reactions.</li> </ul>

<p>scientific concepts effectively.</p> <ul style="list-style-type: none"> <li>Interpreting Nuclear Decay Reactions: Writing and interpreting nuclear decay equations enhances reading comprehension and analytical skills, as students must understand the implications of nuclear changes and the particles involved.</li> </ul>	
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**Differentiation through *Universal Design for Learning***

<b>UDL Indicator</b>	<b>Teacher Actions:</b>
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<p><b>Representation:</b>  <i>I can qualitatively and quantitatively describe nuclear chemistry.</i></p> <ul style="list-style-type: none"> <li>Provide information in various formats, such as videos, infographics, and interactive simulations. For example, using animations to illustrate nuclear decay processes helps visualize complex concepts.</li> <li>Use diagrams, charts, and models to represent nuclear structures, decay equations, and energy changes. Visual aids can help students grasp abstract concepts and enhance understanding.</li> <li>Offer bilingual materials or glossaries that include key terms in both English and the students' native languages. This support ensures comprehension of scientific vocabulary essential for qualitative and quantitative descriptions.</li> </ul>
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**Supporting Multilingual/English Learners**

<b>Related <i>CELP standards:</i></b>	<b>Learning Targets:</b>
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<p><b>An EL can conduct research and evaluate and communicate findings to answer questions or solve problems.</b>  <i>I can identify common particles and energies involved in nuclear reactions</i></p> <ul style="list-style-type: none"> <li>Level 1: I can verbally describe the parts of a nuclear chemical reaction</li> <li>Level 2: I can interpret nuclear chemical reaction</li> <li>Level 3: I can analyze scenarios (word problems) and choose appropriate equations to solve problems independently. I can explain my problem-solving process and justify my choices of equations.</li> <li>Level 4: I can critique and refine problem-solving strategies based on verbal or written feedback.</li> <li>Level 5: I can synthesize information from multiple sources to solve real-world problems involving nuclear equations and reactions and explain my solutions effectively.</li> </ul>
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\*The CELP guidance is to **support the development of language**; access to course content expectations should not change as a result of MLL status.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can qualitatively and quantitatively describe nuclear chemistry	<ul style="list-style-type: none"> <li>I can describe nuclear structure in terms of protons, neutrons, and electrons</li> <li>I can calculate mass defect and binding energy for nuclei</li> <li>I can Identify common particles and energies involved in nuclear reactions</li> <li>I can write and balance nuclear equations</li> <li>I can recognize common modes of radioactive decay</li> <li>I can Identify common particles and energies involved in nuclear decay reactions</li> <li>I can write and balance nuclear decay equations</li> <li>I can calculate kinetic parameters for decay processes, including half-life</li> </ul>	

Course Title:	Content Area:	Credit (if applicable)
Cooperative Work Experience 50/100	CTE	CWE 50 Hours: 0.50 credit CWE 100 Hours: 1.00 credit

**Course Description:**  
 The Career Work Experience course provides students with the opportunity to gain real-world experience through a 50- or 100-hour internship in a career field of interest. Students will apply academic knowledge and develop essential workplace skills such as communication, teamwork, time management, and problem-solving. Through hands-on learning, students will gain a better understanding of professional expectations, workplace safety, and ethical responsibilities. They will engage in meaningful reflection to identify their strengths, areas for growth, and future career goals. Students will also create and maintain a career portfolio to support their career readiness. This course helps students connect classroom learning to real-world applications, build confidence, and prepare for life beyond high school.

Aligned Core Resources:	Connection to the <i>BPS Vision of the Graduate</i>
Work Based Learning Software - Tracking internship hours and job placements	Meaningfully Contribute to a Global Society <ul style="list-style-type: none"> <li>• Collaboration</li> <li>• Social and Cross-Cultural Skills</li> <li>• Empathy</li> </ul> Effectively Communicate in a Global Society <ul style="list-style-type: none"> <li>• Communication</li> <li>• Technology Literacy</li> </ul> Successfully Employ Skills for Self-Sufficiency <ul style="list-style-type: none"> <li>• Goal Directed</li> </ul>

Additional Course Information:	Link to <i>Completed Equity Audit</i>
<b>Knowledge/Skill Dependent courses/prerequisites</b>  Prerequisite BPS Course: Introduction to Cooperative Work Experience - successful completion with a course grade of 75% or better and teacher recommendation	<a href="#">CWE 50/100 Equity Curriculum Review</a>

Standard Matrix	
District Learning Expectations and Standards NBEA National Standards 2023	Internship
<b>Career Development</b>	
<b>4. School-to-Career Transition</b> Develop strategies to effectively transition from school to career	<b>X</b>
<b>5. Lifelong Learning</b> Relate the importance of lifelong learning to personal career success.	<b>X</b>
<b>Communication</b>	
<b>1. Foundations of Communication</b> Listen actively, use the communication, read and research information, and integrate technology to enhance communication effectiveness.	<b>X</b>
<b>2. Interpersonal Skills</b> Apply interpersonal skills in personal and professional environments to communicate effectively.	<b>X</b>
<b>3. Written Communication</b> Prepare clear, complete, concise, correct, and courteous written messages for personal and professional uses.	<b>X</b>
<b>4. Spoken Communication</b> Demonstrate professional speaking techniques and strategies.	<b>X</b>

**Unit Links**  
[Internship](#)

**Unit Title:**

Internship

**Relevant Standards: Bold indicates priority**

**NBEA Standards 2023**

Career Development

4. School-to-Career Transition

Develop strategies to effectively transition from school to career

5. Lifelong Learning

Relate the importance of lifelong learning to personal career success.

Communication

1. Foundations of Communication

Listen actively, use the communication, read and research information, and integrate technology to enhance communication effectiveness.

2. Interpersonal Skills

Apply interpersonal skills in personal and professional environments to communicate effectively.

3. Written Communication

Prepare clear, complete, concise, correct, and courteous written messages for personal and professional uses.

4. Spoken Communication

Demonstrate professional speaking techniques and strategies.

**Essential Question(s):**

- What skills are essential in the workplace, and how can I develop them?
- How can I apply what I have learned in school to real-world situations?
- What are my strengths and areas for growth in the workplace, and how can I improve?
- What are ethical considerations I should be aware of in the workplace?
- How can I evaluate my internship experience and use it to inform my future career goals?

**Enduring Understanding(s):**

- Students will participate in an internship within their chosen career.
- Students will demonstrate language arts & mathematics knowledge and skills as applicable in their individual internship placements.
- Students will use a variety of communication techniques in their individual internship placements.
- Students will effectively communicate with their co-workers and supervisors through oral, written, and nonverbal communication.
- Students will employ proper grammar, punctuation, and spelling in all written communications and documents.
- Students will demonstrate critical thinking and problem solving skills as needed in individual internship placements.
- Students will use technology as appropriate for their individual workplace internships.
- Students will demonstrate proper use of workplace technology as applicable.
- Students will be able to describe the nature of the business they are in.
- Students will demonstrate personal safety.
- Students will follow all jobsite safety rules and regulations.
- Students will be able to describe all emergency procedures.
- Students will demonstrate leadership and teamwork skills at their individual placements.
- Students will develop working professional relationships with their colleagues.
- Students will be able to identify ethical and legal requirements within their individual internship placements.
- Students will demonstrate positive behaviors and employability skills throughout their internship placement.

	<ul style="list-style-type: none"> <li>• Students will maintain a career portfolio.</li> <li>• Students will identify requirements for maintaining a position and furthering their career.</li> <li>• Students will identify professional development opportunities in their career field.</li> <li>• Students will research licensing, certification, and credentialing requirements.</li> <li>• Students will use information management techniques and strategies in the workplace to assist in decision-making in their individual internship placements.</li> <li>• Students will employ time management skills in their internship placements.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• Internship</li> <li>• Supervisor Evaluation</li> <li>• Teacher Evaluation</li> <li>• Self-Reflection</li> <li>• Portfolio</li> <li>• Weekly journal entries</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing - entirety of semester <ul style="list-style-type: none"> <li>○ 50 hours (average 4-6 hours per week)</li> <li>○ 100 hours (average 6-8 hours per week)</li> </ul> </li> </ul>
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">CWE 50/100 Family Overview</a> <a href="#">CWE 50/100 Family Overview - Spanish</a>	<p>Students will use Google Classroom and Google Docs to complete journal entries weekly.</p> <p>Students will use technology to create their portfolio. They can use among multiple Google tools: Sites, Sheets, Docs, or Slides</p>
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
<p>Internship, career, knowledge, skills, communication, strategies, active listening, grammar, punctuation, spelling, oral, nonverbal, critical thinking, solutions, problem solving, technology, applications, organizations, scope, OSHA, Safety, Health, Emergency, Rules, Regulations, leadership, teamwork, ethics, legal, policies, procedures, employability skills, career portfolio, professional development, licensing, certification, credentials, decision-making, information management, time management,</p>	N/A
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>
<p>Students will participate in an internship in their career field of choice. Students will be exposed to learning beyond the classroom.</p>	<ul style="list-style-type: none"> <li>• Working in an internship/job is easy and requires minimal skill level.</li> <li>• Internships are just about completing basic tasks.</li> <li>• Students think they know everything before they start.</li> <li>• Students will not make an impact on the business.</li> <li>• Students will get a job offer at the end of the internship.</li> <li>• Students will only learn technical skills, not soft skills.</li> </ul>
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
N/A	N/A
<b>Differentiation through <i>Universal Design for Learning</i></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>

<p><i>Engagement</i></p> <ul style="list-style-type: none"> <li>● 7.1 Optimize choice and autonomy</li> <li>● 7.2 Optimize relevance, value, and authenticity</li> </ul> <p><i>Representation</i></p> <ul style="list-style-type: none"> <li>● 3.1 Connect prior knowledge to new learning</li> </ul> <p><i>Action/Expression</i></p> <ul style="list-style-type: none"> <li>● 6.1 Set meaningful goals</li> <li>● 6.2 Anticipate and plan for challenges</li> <li>● 6.3 Enhance capacity for monitoring progress</li> </ul>	<p><i>Engagement</i></p> <ul style="list-style-type: none"> <li>● 7.1 Teachers will ensure students explore a field of interest and design a collaborative approach to design learning goals and activities</li> <li>● 7.2 Teachers will ensure activities are personalized, age, ability appropriate for the learners' lives; invite self-reflection to activities</li> </ul> <p><i>Representation</i></p> <ul style="list-style-type: none"> <li>● 3.1 Teachers will analyze student journal entries to understand their learning and help build connections between what was taught in the Introduction to Cooperative Work Experience course.</li> <li>● 3.1 Guide students in developing a portfolio that they can take with them post high school.</li> </ul> <p><i>Action/Expression</i></p> <ul style="list-style-type: none"> <li>● 6.1 - 6.3 Teacher will guide students in the development of goals and planning for their future through self-reflection and the development of their career portfolio.</li> </ul>
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**Supporting Multilingual/English Learners**

<b>Related <u>CELP standards</u></b>	<b>Learning Targets</b>
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<p><b>Communicate effectively in written and orally in a professional manner.</b></p> <ul style="list-style-type: none"> <li>● I understand and can apply essential workplace skills, including communication, teamwork, and problem-solving. <ul style="list-style-type: none"> <li>○ Level 1: I can understand and use basic workplace phrases and vocabulary to ask simple questions and follow instructions in team activities.</li> <li>○ Level 2: I can use basic workplace language to participate in short conversations and ask for clarification or help when working with a team.</li> <li>○ Level 3: I can communicate effectively in the workplace by sharing my ideas, asking questions and working with others to solve problems.</li> <li>○ Level 4: I can use workplace-specific language to actively participate in team discussions, provide feedback, and solve problems independently and with others.</li> <li>○ Level 5: I can confidently communicate and collaborate in the workplace, solve complex problems, and lead team discussions using advanced language skills.</li> </ul> </li> <li>● I can gain insights into industry-specific practices, trends, and challenges relevant to the internship field. <ul style="list-style-type: none"> <li>○ Level 1: I can recognize and understand basic industry-related vocabulary and phrases related to the internship field.</li> <li>○ Level 2: I can understand and use basic language to discuss industry practices, trends, and challenges in simple terms.</li> <li>○ Level 3: I can explain basic industry practices, trends, and challenges using appropriate language, and begin to understand how they apply to the internship.</li> <li>○ Level 4: I can analyze and explain industry-specific trends, practices, and challenges in more detail, using appropriate vocabulary and examples from my internship experience.</li> <li>○ Level 5: I can critically evaluate industry-specific trends, practices, and challenges, and clearly explain their implications in the context of the internship field.</li> </ul> </li> <li>● I can learn to manage time effectively, prioritize tasks, and contribute to team projects. <ul style="list-style-type: none"> <li>○ Level 1: I can understand and follow basic instructions related to time management and team tasks.</li> <li>○ Level 2: I can use basic language to talk about time management and working on tasks as part of a team.</li> <li>○ Level 3: I can manage my time by following instructions to complete tasks and contribute to team projects.</li> <li>○ Level 4: I can manage my time effectively, prioritize tasks, and contribute meaningfully to team projects.</li> <li>○ Level 5: I can independently manage my time, prioritize tasks, and take a leadership role in team projects.</li> </ul> </li> <li>● I can develop the ability to assess personal strengths and areas for improvement based on feedback and experiences. <ul style="list-style-type: none"> <li>○ Level 1: I can understand basic feedback and recognize simple strengths and areas for improvement with support.</li> <li>○ Level 2: I can express simple thoughts about my strengths and areas of improvement based on feedback.</li> <li>○ Level 3: I can reflect on feedback and describe my strengths and areas for improvement.</li> </ul> </li> </ul>
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- Level 4: I can assess my own strengths and weaknesses based on feedback and set goals to improve.
- Level 5: I can independently assess my strengths and areas for growth, set clear improvement goals, and reflect on progress

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
Ongoing	I can understand and apply essential workplace skills, including communication, teamwork, and problem-solving.	<ul style="list-style-type: none"> <li>● I can demonstrate effective verbal and written communication skills in daily interactions.</li> <li>● I can actively contribute to team projects, showing the ability to collaborate and share responsibilities.</li> <li>● I can resolve conflicts or misunderstandings with peers using appropriate problem-solving techniques.</li> <li>● I can receive constructive feedback from supervisors on professional behavior and engagement.</li> </ul>	
Ongoing	I can gain insights into industry-specific practices, trends, and challenges relevant to the internship field.	<ul style="list-style-type: none"> <li>● I can complete a research project that includes key industry trends, terminology, and best practices.</li> <li>● I can engage in discussions about industry trends and apply insights to tasks.</li> <li>● I can shadow professionals in the field and summarize key takeaways in a reflective journal.</li> </ul>	
Ongoing	I can learn to manage time effectively, prioritize tasks, and contribute to team projects.	<ul style="list-style-type: none"> <li>● I can develop and submit a personal time management plan.</li> <li>● I can maintain a calendar, either on paper or electronically.</li> <li>● I complete all tasks on time and am accountable to my peers and employer.</li> </ul>	
Ongoing	I can develop the ability to assess personal strengths and areas for improvement based on feedback and experiences.	<ul style="list-style-type: none"> <li>● I can maintain a reflective journal documenting experiences, challenges, and learning outcomes.</li> <li>● I can submit a final self-assessment that includes goals achieved, skills developed, and plans for future growth.</li> </ul>	

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
PLTW Principles of Engineering	CTE: Engineering and Technology	9-12	1 High School Credit 3 College Credits via UNH upon meeting UNH criteria

**Course Description:**

Principles of Engineering is a full-year course designed to be a high school student's second exposure to the PLTW Engineering program and is appropriate for students in grades 9-12. In Principles of Engineering, students explore a broad range of engineering disciplines, careers, and design and solve real-world engineering problems.

This course introduces students to engineering concepts that are applicable to a variety of engineering disciplines and empowers them to develop technical skills through the use of engineering tools such as 3-D modeling software, hands-on prototyping equipment, programming software, and robotics hardware to bring their solutions to life. Students apply the engineering design process to solve real-world problems across a breadth of engineering fields such as mechanical, robotics, infrastructure, environmental sustainability, and product design and development.

Using PLTW's activity-, project-, problem-based (APB) instructional approach, students advance from completing structured activities to solving open-ended projects and problems that provide opportunities to develop planning and technical documentation skills, as well as in-demand, transportable skills such as problem solving, critical thinking, collaboration, communication, and ethical reasoning. The last is particularly important as the course encourages students to consider the impacts of engineering decisions.

Through individual and collaborative team activities, projects, and problems, students create solutions to problems as they practice common engineering design and development protocols, such as experimental design, testing, project management, and peer review.

**Aligned Core Resources:**

- [PLTW Online](#) (some elements require PLTW login credentials)
- [Course Outline - Principles of Engineering](#)
- Common Core State Standards for English Language Arts Anchor Standards
- Common Core State Standards for Mathematics
- Next Generation Science Standards
- Standards for Technological and Engineering Literacy

**Connection to the *BPS Vision of the Graduate***

- Meaningfully contribute to a global society:**  
Collaboration
- Effectively communicate in a global society:**  
Communications and Technology Literacy
- Demonstrate Academic Knowledge and Skills:**  
Critical Thinking and Problem Solving

**Additional Course Information:**  
**Knowledge/Skill Dependent courses/prerequisites**

**Link to [Completed Equity Audit](#)**

Concurrent enrollment in grade appropriate math class.

[Equity Curriculum Review - PLTW Principles of Engineering \(2024-25\)](#)

**Standard Matrix**

See [Standards Alignment - Principles of Engineering](#) for alignment to:

- Common Core State Standards for English Language Standards (Page 2)
  - Anchor Standards: Research to Build and Present Knowledge
  - Writing: Text Types and Purposes
  - Reading Informational Text: Key Ideas and Details
- Common Core State Standards for Mathematics (Page 7)
  - Geometry: Visualization and Spatial Reasoning
  - Statistics and Probability: Interpreting Categorical and Quantitative Data
  - Statistics and Probability: Making Inferences and Justifying Conclusions
  - Number and Quantity: Quantities
- Next Generation Science Standards (Page 12)
  - Engineering Design: Developing Possible Solutions
  - Engineering Design: Evaluating Solutions
  - Engineering Design: Analyzing and Interpreting Data
  - Engineering Design: Optimizing the Design Solution
  - Engineering Design: Developing and Using Models
- Standards for Technological and Engineering Literacy (Page 25)

- Creativity and Innovation
- Communication and Collaboration
- Understanding and Applying Engineering Concepts
- Global Awareness in Engineering
- Technology and Engineering in Design
- Collaboration and Teamwork

## Unit Links

[Unit 0: Introduction to Product Design and Development](#)

[Unit 1: Mechanical Design](#)

[Unit 2: Application of Robotics](#)

[Unit 3: Energy in Action](#)

[Unit 4: Designing Infrastructure and Developing Sustainability](#)

<b>Unit Title:</b>	
Unit 0: Introduction to Product Design and Development	
<b>Relevant Standards: Bold indicates priority</b>	
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards <b>Standards for Technological and Engineering Literacy</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
0.1 - 1 How does a design team know what problem to solve? 0.1 - 2 Why is empathy an important skill in engineering design? 0.1 - 3 How do engineers communicate designs and solutions? 0.1 - 4 What is a decision matrix and why is it used? 0.2 - 1 What techniques do engineers use to visually present design ideas? 0.2 - 2 What advantages does Computer-Aided Design (CAD) provide over traditional paper and pencil design? 0.2 - 3 What advantages does paper and pencil design provide over CAD? 0.2 - 4 What would happen if engineers did not follow accepted dimensioning standards and guidelines, but instead, used their own individual dimensioning methods? 0.2 - 5 What are the differences between manufacturing processes? 0.3 - 1 What properties should be considered when evaluating material choice for a product? 0.3 - 2 What data should be collected in a testing process? 0.3 - 3 How is material testing data useful? 0.3 - 4 How does an engineer predict the performance and safety of a selected material? 0.3 - 5 What is the difference between the independent variable and the dependent variable in experimental design? 0.4 - 1 What are two possible ways that a team could come to a consensus in a disagreement over a solution to a problem? 0.4 - 2 Why is it important for the team to come to a consensus on the issues that arise? What are some reasons that the team leader should not dictate the direction of the group? 0.4 - 3 How can you design a product that meets the needs of a user?	<ul style="list-style-type: none"> <li>Engineers define problems by understanding user needs, identifying constraints, and analyzing real-world contexts.</li> <li>Empathy is essential to engineering design because it helps create solutions that are meaningful, inclusive, and user-centered.</li> <li>Effective communication through sketches, models, CAD, and standardized drawings ensures ideas are clearly shared and understood.</li> <li>Decision-making tools, like decision matrices, help engineers evaluate design options objectively and collaboratively.</li> <li>Both manual sketching and CAD play important roles in visualizing and refining design ideas, each offering unique advantages.</li> <li>Following industry-standard drawing and dimensioning practices is critical to ensure consistency, accuracy, and manufacturability.</li> <li>Engineers choose materials and processes based on performance data, testing results, and intended product use.</li> <li>Teamwork, respectful collaboration, and shared decision-making are key to solving problems effectively and developing successful designs.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>Written documents, Formative and Summative Assessment, Hands on activities</li> <li>Student teams take on the role of a product development team using the engineering design process to solve problems and create value for others.</li> </ul>	16 Class Periods
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>

<a href="#">Family Overview - PLTW Principles of Engineering</a> <a href="#">Family Overview - PLTW Principles of Engineering (Spanish)</a>			N/A
<b>Unit-specific Vocabulary:</b>			<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Problem Statement Design Brief Constraints Criteria Empathy User-Centered Design Stakeholder Sketching	Tolerance Standardization Decision Matrix Prototype Material Properties Stress/Strain Projection Dimensioning CAD (Computer-Aided Design)	Testing Manufacturing Process Consensus Collaboration Iteration Communication Feasibility Orthographic Technical Drawing	N/A
<b>Opportunities for Interdisciplinary Connections:</b>			<b>Anticipated misconceptions:</b>
<ul style="list-style-type: none"> <li>Students apply math skills when using measurement, precision, and tolerances in sketching and CAD work, as well as when analyzing data from material testing and decision matrices.</li> <li>The scientific method and experimentation are reinforced as students test materials, define variables, collect data, and evaluate results to predict material performance and safety.</li> <li>Through technical and informational writing, students strengthen their ability to clearly document and communicate design ideas, write reports, and present solutions to both technical and non-technical audiences.</li> <li>Exploring the ethics and impact of design allows students to consider real-world implications, such as accessibility, sustainability, and cultural relevance, connecting engineering decisions to broader social and historical contexts.</li> </ul>			<ul style="list-style-type: none"> <li>Students may think the problem is always clearly defined or given to them.</li> <li>Students may believe empathy is only about "being nice" and not relevant to engineering.</li> <li>Students may think rough sketches or personal styles are enough for communicating technical ideas.</li> <li>Students may think CAD is always better than sketching.</li> <li>Students may believe a decision matrix will always give the "correct" answer.</li> <li>Students may assume the strongest material is always the best choice.</li> <li>Students may think testing is just a final step to prove the design works.</li> <li>Students may confuse independent and dependent variables, or think all variables are tested at once.</li> <li>Students may believe consensus means everyone gets exactly what they want.</li> <li>Students may assume the team leader should always make final decisions.</li> </ul>
<b>Connections to Prior Units:</b>			<b>Connections to Future Units:</b>
N/A			<ul style="list-style-type: none"> <li>The foundational skills in sketching, CAD, and dimensioning from Unit 0 are directly applied when students model and refine mechanical parts in Unit 1.</li> <li>The problem-solving and iterative design process introduced in Unit 0 is critical as students develop and refine robotic systems in Unit 2.</li> <li>The scientific testing process and data analysis techniques from Unit 0 are essential when evaluating energy systems and material performance in Unit 3.</li> <li>The user-centered design principles from Unit 0 inform how students consider environmental and societal impacts when designing sustainable infrastructure in Unit 4.</li> </ul>
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>			

UDL Indicator	Teacher Actions:
<p><b>Learning Target 1:</b> I can identify and define a clear problem based on user needs, constraints, and criteria.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Representation:</b> Present students with an authentic, ill-defined problem rooted in a real-world context (perhaps a challenge facing their school or community). This inherently engages their interest and necessitates exploring user needs and constraints to even begin defining the problem.</li> </ul> <p><b>Learning Target 3:</b> I can communicate my design ideas using sketches, models, presentations, and technical documentation.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Action &amp; Expression:</b> Provide opportunities for students to communicate their design ideas for different purposes and to diverse audiences (e.g., peers for feedback, experts for critique, younger students to explain a concept). This emphasizes the importance of tailoring communication methods.</li> </ul> <p><b>Learning Target 4:</b> I can use a decision matrix to evaluate and select the best solution among alternatives.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Representation:</b> Engage students in a group process to define the criteria for evaluating potential solutions, assigning weights based on importance. Then, collaboratively apply the decision matrix to the generated alternatives. This fosters ownership and understanding of the selection process.</li> </ul> <p><b>Learning Target 5:</b> I can use sketching, orthographic projections, and 3D models to present design ideas.</p> <ul style="list-style-type: none"> <li>● <b>Action &amp; Expression and Representation:</b> Provide structured instruction and practice for each representation method. Then, offer students choices in which methods they use to present different aspects of their design, allowing them to leverage their strengths and the most appropriate tool for the task.</li> </ul> <p><b>Learning Target 6:</b> I can explain and demonstrate the advantages of CAD software in the design process.</p> <ul style="list-style-type: none"> <li>● <b>Action &amp; Expression and Representation:</b> Provide direct access to CAD software and guide students through tasks that highlight its advantages (e.g., easy modification, precise dimensioning, generating multiple views) by comparing the time and effort required to do the same tasks manually.</li> </ul> <p><b>Learning Target 7:</b> I can describe when hand sketching is more effective than CAD in the design process.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Action &amp; Expression:</b> Engage students in rapid ideation challenges where quick sketching is essential for exploring numerous concepts quickly. Follow this with discussions comparing the efficiency of sketching versus CAD for early-stage design.</li> </ul> <p><b>Learning Target 8:</b> I can follow accepted dimensioning rules to ensure accurate communication of designs.</p> <ul style="list-style-type: none"> <li>● <b>Action &amp; Expression and Representation:</b> Provide students with examples of technical drawings (both correct and incorrect) from industry or practical scenarios and have them analyze and correct the dimensioning errors. This makes the rules more meaningful.</li> </ul> <p><b>Learning Target 9:</b> I can compare different manufacturing processes and choose the best method for a given product.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Representation:</b> Have students examine existing products and research the likely manufacturing processes used. This allows them to connect design features to manufacturing constraints and advantages.</li> </ul> <p><b>Learning Target 10:</b> I can evaluate materials based on mechanical, thermal, and physical properties.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Representation:</b> Engage students in either physical or virtual testing of different materials to observe and collect data on their properties. Analyzing this firsthand data makes the properties more tangible and relevant.</li> </ul> <p><b>Learning Target 11:</b> I can identify and collect accurate data during material or product testing.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Action &amp; Expression:</b> Guide students in designing their own simple experiments, emphasizing the identification of variables and the development of a clear data collection plan. Incorporate peer review of these plans before testing to ensure accuracy and validity.</li> </ul> <p><b>Learning Target 12:</b> I can use test data to make informed decisions about material selection and safety.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Action &amp; Expression:</b> Present students with design scenarios and provide them with sets of test data for different materials. Require them to justify their material selection based on the data and safety considerations.</li> </ul> <p><b>Learning Target 13:</b> I can use material properties and testing results to predict how a material will perform.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Representation:</b> Use software or simulations that allow students to input material properties and predict performance under various conditions. Where possible, connect these predictions to real-world examples.</li> </ul> <p><b>Learning Target 14:</b> I can correctly identify variables in an experiment and control them to ensure valid results.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Action &amp; Expression:</b> Present students with simple, observable phenomena (the "mystery box"). Challenge them to design experiments to investigate the phenomena, explicitly requiring them to identify and justify their choice of independent, dependent, and control variables.</li> </ul> <p><b>Learning Target 15:</b> I can apply collaborative strategies to reach group consensus on a design solution.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Action &amp; Expression:</b> Assign specific roles within design teams and provide structured protocols for collaborative activities (e.g., brainstorming rules, decision-making frameworks). Follow up with individual and group reflections on the effectiveness of their collaboration.</li> </ul> <p><b>Learning Target 16:</b> I can explain why shared decision-making is essential in team engineering projects.</p> <ul style="list-style-type: none"> <li>● <b>Engagement and Representation:</b> Examine real-world engineering projects where the presence or absence of effective shared decision-making significantly impacted the outcome (both positively and negatively). This provides compelling context for the importance of collaboration.</li> </ul>	
<b>Supporting Multilingual/English Learners</b>	
Related <b>CELP standards:</b>	<b>Learning Targets:</b>

CELP Standard	LT1	LT2	LT3	LT4	LT5	LT6	LT7	LT8	LT9	LT10	LT11	LT12	LT13	LT14	LT15	LT16	LT17
1. Construct meaning from oral presentations and literary and informational text	X	X				X	X		X	X	X	X	X	X		X	X
2. Participate in grade-appropriate oral and written exchanges of information, ideas, and analyses	X	X	X	X	X	X	X		X		X	X		X	X	X	X
3. Speak and write about grade-appropriate complex literary and informational texts and topics			X			X	X		X	X		X	X	X		X	X
4. Construct grade-appropriate oral and written claims and support them with reasoning and evidence	X			X		X	X		X	X		X	X	X		X	X
5. Conduct research and evaluate and communicate findings to answer questions or solve problems	X	X							X	X	X	X	X	X			X
6. Analyze and critique the arguments of others orally and in writing				X		X	X		X			X	X	X	X	X	X
7. Adapt language choices to purpose, task, and audience when speaking and writing			X		X	X	X	X	X	X	X	X	X				X
8. Determine the meaning of words and phrases in oral presentations and literary and informational text	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9. Create clear and coherent grade-appropriate speech and text	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10. Make accurate use of standard English to communicate in grade appropriate speech and writing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can identify and define a clear problem based on user needs, constraints, and criteria.	<ul style="list-style-type: none"> <li>I can conduct research or interviews to discover user needs.</li> <li>I can write a clear and concise problem statement.</li> <li>I can identify constraints (e.g., cost, materials, safety).</li> <li>I can explain how the problem aligns with real-world needs.</li> </ul>	
2	I can demonstrate empathy to understand user perspectives and needs in the design process.	<ul style="list-style-type: none"> <li>I can use user feedback to guide design decisions.</li> <li>I can ask questions that reveal pain points or challenges.</li> <li>I can consider diverse viewpoints and accessibility in my designs.</li> <li>I can reflect user needs in my final solution.</li> </ul>	
3	I can communicate my design ideas using sketches, models, presentations, and technical documentation.	<ul style="list-style-type: none"> <li>I can create annotated sketches or technical drawings.</li> <li>I can present ideas clearly using visuals and spoken explanation.</li> </ul>	

		<ul style="list-style-type: none"> <li>• I can use appropriate vocabulary to describe engineering decisions.</li> <li>• I can collaborate and give constructive feedback.</li> </ul>
4	I can use a decision matrix to evaluate and select the best solution among alternatives.	<ul style="list-style-type: none"> <li>• I can identify multiple design solutions.</li> <li>• I can select appropriate criteria and assign weights.</li> <li>• I can score and compare solutions based on objective data.</li> <li>• I can justify the final decision using matrix results.</li> </ul>
5	I can use sketching, orthographic projections, and 3D models to present design ideas.	<ul style="list-style-type: none"> <li>• I can create freehand sketches with labels and dimensions.</li> <li>• I can draw isometric and orthographic views.</li> <li>• I can build 3D models to communicate form and function.</li> <li>• I can use visual tools to express design intent.</li> </ul>
6	I can explain and demonstrate the advantages of CAD software in the design process.	<ul style="list-style-type: none"> <li>• I can create a digital 3D model of a design.</li> <li>• I can modify and test designs quickly in CAD.</li> <li>• I can use CAD tools to measure and evaluate dimensions.</li> <li>• I can explain how CAD supports manufacturing and prototyping.</li> </ul>
7	I can describe when hand sketching is more effective than CAD in the design process.	<ul style="list-style-type: none"> <li>• I can quickly communicate initial ideas using sketches.</li> <li>• I can capture design thinking during brainstorming.</li> <li>• I can create rough visualizations without software tools.</li> <li>• I can combine sketches with written notes for ideation..</li> </ul>
8	I can follow accepted dimensioning rules to ensure accurate communication of designs.	<ul style="list-style-type: none"> <li>• I can apply ANSI or ISO standards when dimensioning.</li> <li>• I can dimension all critical features of a part clearly.</li> <li>• I can avoid redundant or conflicting dimensions.</li> <li>• I can explain how poor dimensioning leads to manufacturing errors.</li> </ul>
9	I can compare different manufacturing processes and choose the best method for a given product.	<ul style="list-style-type: none"> <li>• I can describe common manufacturing processes (e.g., casting, milling, 3D printing, injection molding).</li> <li>• I can match materials to compatible processes.</li> <li>• I can consider cost, complexity, and volume in decision-making.</li> <li>• I can justify process selection based on product requirements.</li> </ul>
10	I can evaluate materials based on mechanical, thermal, and physical properties.	<ul style="list-style-type: none"> <li>• I can compare tensile strength, elasticity, hardness, etc.</li> <li>• I can match material properties to function and environment.</li> <li>• I can consider cost, weight, durability, and recyclability.</li> <li>• I can choose materials based on performance data.</li> </ul>
11	I can identify and collect accurate data during material or product testing.	<ul style="list-style-type: none"> <li>• I can define independent, dependent, and control variables.</li> <li>• I can record force, stress, strain, deflection, etc.</li> <li>• I can use proper measurement tools and techniques.</li> <li>• I can organize data in charts, tables, or graphs.</li> </ul>
12	I can use test data to make informed decisions about material selection and safety.	<ul style="list-style-type: none"> <li>• I can analyze data to find trends and failure points.</li> <li>• I can compare materials based on test results.</li> <li>• I can identify safety margins and tolerances.</li> </ul>

		<ul style="list-style-type: none"> <li>• I can use results to improve future designs.</li> </ul>
13	I can use material properties and testing results to predict how a material will perform.	<ul style="list-style-type: none"> <li>• I can use stress-strain curves and material specs.</li> <li>• I can apply factors of safety in designs.</li> <li>• I can predict failure modes under real-world conditions.</li> <li>• I can make recommendations for safe use of materials.</li> </ul>
14	I can correctly identify variables in an experiment and control them to ensure valid results.	<ul style="list-style-type: none"> <li>• I can define and label independent, dependent, and control variables.</li> <li>• I can design fair tests that isolate variables.</li> <li>• I can explain how each variable affects results.</li> <li>• I can analyze how changing one variable influences the outcome.</li> </ul>
15	I can apply collaborative strategies to reach group consensus on a design solution.	<ul style="list-style-type: none"> <li>• I can use structured discussion or voting.</li> <li>• I can weigh evidence and consider all viewpoints.</li> <li>• I can compromise when necessary to move forward.</li> <li>• I can respect all team members' contributions.</li> </ul>
16	I can explain why shared decision-making is essential in team engineering projects.	<ul style="list-style-type: none"> <li>• I can describe how consensus leads to stronger, more inclusive designs.</li> <li>• I can identify the risks of a leader dominating the process.</li> <li>• I can encourage input from all team members.</li> <li>• I can reflect on how team dynamics affect project success.</li> </ul>
17	I can use user feedback and data to design a product that effectively solves a real problem.	<ul style="list-style-type: none"> <li>• I can identify user needs and constraints.</li> <li>• I can design a solution that fits those needs.</li> <li>• I can collect feedback and test with users.</li> <li>• I can improve the design based on real input.</li> </ul>

<b>Unit Title:</b>		
Unit 1: Mechanical Design		
<b>Relevant Standards: Bold indicates priority</b>		
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards <b>Standards for Technological and Engineering Literacy</b>		
<b>Essential Question(s):</b>		<b>Enduring Understanding(s):</b>
1.1 - 1 How do engineers quantify the mechanical advantage of a system? 1.1 - 2 How do engineers apply their knowledge of simple machines to solve problems? 1.1 - 3 How do engineers quantify energy, work, and power? 1.1 - 4 How do engineers apply their knowledge of energy, work, and power to solve problems? 1.2 - 1 How are mechanisms used to convert one type of motion to another? 1.2 - 2 How do engineers manipulate motion to solve design problems? 1.3 - 1 How can you apply your understanding of machines and mechanisms to solve an authentic problem?		Engineers apply principles of mechanical advantage, energy, work, power, and motion to design efficient systems that solve real-world problems. By understanding and manipulating simple machines and mechanisms, they can convert and control different types of motion to create innovative, functional, and efficient solutions.
<b>Demonstration of Learning:</b>		<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>Written documents, Formative and Summative Assessment, Hands on activities</li> <li>Students end the unit by working collaboratively and applying their knowledge to solve a real-world agricultural problem.</li> </ul>		17 Class Periods
<b>Family Overview (link below)</b>		<b>Integration of Technology:</b>
<a href="#">Family Overview - PLTW Principles of Engineering</a> <a href="#">Family Overview - PLTW Principles of Engineering (Spanish)</a>		N/A
<b>Unit-specific Vocabulary:</b>		<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Simple Machines	Mechanical	Friction
Force	Advantage	Load Distance
Work	Kinetic Energy	Effort Distance
Power	Potential Energy	Rotary Motion
Energy	Mechanical	Linear Motion
Input Force /	Efficiency	Gear Ratio
Output Force	Torque	Linkage
Effort / Load	Velocity	Crank
Pulley	Moment of Inertia	Work-Energy
Lever	Screw	Theorem
Inclined Plane	Wedge	Wheel and Axle
		N/A
<b>Opportunities for Interdisciplinary Connections:</b>		<b>Anticipated misconceptions:</b>

<ul style="list-style-type: none"> <li>Energy, Work, and Power: Understanding how mechanical systems involve the transfer of energy, work done, and the relationship between force, distance, and energy directly ties to physics principles such as motion and thermodynamics.</li> <li>Mechanical Advantage and Force Calculations: Calculating mechanical advantage, force, and efficiency involves applying algebraic equations and ratios, helping students practice mathematical problem-solving skills.</li> </ul>	<ul style="list-style-type: none"> <li>A higher mechanical advantage always means a more efficient system.</li> <li>Energy and work are the same thing.</li> </ul>
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<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
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<ul style="list-style-type: none"> <li>The problem-solving and empathy learned in Unit 0 are foundational for students as they design mechanical systems in Unit 1.</li> <li>The tools and strategies for defining problems, brainstorming solutions, and testing prototypes in Unit 0 are directly applied when considering mechanical advantage, efficiency, and system optimization in Unit 1.</li> <li>Both units emphasize a user-centered approach, with Unit 0 focusing on the broader problem and context, while Unit 1 applies that understanding to design efficient mechanical systems that solve real-world problems.</li> </ul>	<ul style="list-style-type: none"> <li>In Unit 2 (Application of Robotics), the principles of mechanical design are used to create and control robotic systems.</li> <li>In Unit 3 (Energy in Action), students build on mechanical principles to explore energy conversion and optimization.</li> <li>In Unit 4 (Designing Infrastructure and Developing Sustainability), mechanical design knowledge is applied to develop sustainable infrastructure that is efficient and energy-conscious.</li> </ul>
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<b>Differentiation through <a href="#">Universal Design for Learning</a></b>
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<b>UDL Indicator</b>	<b>Teacher Actions:</b>
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Engagement <ul style="list-style-type: none"> <li>Allow students to explore different mechanical design concepts (e.g., levers, pulleys, gears) through hands-on activities, simulations, or real-world case studies. Students can choose how they wish to engage with the material: through physical models, digital simulations, or problem-based learning activities.</li> </ul>
Action & Expression <ul style="list-style-type: none"> <li>Offer multiple ways to present complex mechanical design concepts, such as using visuals (diagrams, 3D models), providing interactive online tools (e.g., CAD software), and offering scaffolded explanations for technical terms. Provide glossaries and translated resources for English language learners (ELLs) to understand the specialized vocabulary used in mechanical design.</li> </ul>

<b>Supporting Multilingual/English Learners</b>
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<b>Related <a href="#">CELP standards:</a></b>	<b>Learning Targets:</b>
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CELP Standard	LT 1	LT 2	LT 3	LT 4	LT 5	LT 6	LT 7
1. Construct meaning from oral presentations and literary and informational text	X	X	X	X	X	X	X
2. Participate in grade-appropriate oral and written exchanges of information, ideas, and analyses	X	X	X	X	X	X	X
3. Speak and write about grade-appropriate complex literary and informational texts and topics	X	X	X	X	X	X	X
4. Construct grade-appropriate oral and written claims and support them with reasoning and evidence	X	X	X	X	X	X	X
5. Conduct research and evaluate and communicate findings to answer questions	X	X	X	X	X	X	X

or solve problems							
6. Analyze and critique the arguments of others orally and in writing	X	X	X	X	X	X	X
7. Adapt language choices to purpose, task, and audience when speaking and writing	X	X	X	X	X	X	X
8. Determine the meaning of words and phrases in oral presentations and literary and informational text	X	X	X	X	X	X	X
9. Create clear and coherent grade-appropriate speech and text	X	X	X	X	X	X	X
10. Make accurate use of standard English to communicate in grade appropriate speech and writing	X	X	X	X	X	X	X

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can calculate ideal and actual mechanical advantage using input and output forces or distances.	<ul style="list-style-type: none"> <li>I can correctly calculate IMA using distance ratios</li> <li>I can correctly calculate AMA using force measurements</li> <li>I can compare and explain differences between IMA and AMA</li> <li>I can identify real-world factors (like friction) that affect mechanical advantage</li> </ul>	
2	I can identify and apply simple machines to design systems that reduce effort or optimize mechanical advantage.	<ul style="list-style-type: none"> <li>I can identify the six types of simple machines in real mechanisms</li> <li>I can choose appropriate simple machines to solve a problem</li> <li>I can explain how a system of simple machines reduces force or changes motion</li> <li>I can create or analyze a design using two or more simple machines</li> </ul>	
3	I can calculate work, energy, and power using standard formulas and appropriate units.	<ul style="list-style-type: none"> <li>I can use formulas to calculate work (<math>W = F \times d</math>), power (<math>P = W/t</math>), and energy</li> <li>I can use correct units (joules, watts, newtons, etc.) in calculations</li> <li>I can create labeled diagrams showing force, distance, and energy transfer</li> <li>I can solve problems involving energy efficiency</li> </ul>	
4	I can apply energy principles to analyze and improve the performance of mechanical systems.	<ul style="list-style-type: none"> <li>I can analyze a system for energy input, output, and losses</li> <li>I can calculate power requirements for a machine or system</li> <li>I can recommend ways to improve system efficiency</li> <li>I can justify design choices based on energy and power calculations</li> </ul>	
5	I can explain how different mechanisms (cams, gears, linkages) convert one type of motion into another.	<ul style="list-style-type: none"> <li>I can describe different types of motion (linear, rotary, reciprocating, oscillating)</li> <li>I can identify mechanisms (like cams, cranks, rack and pinion) and explain their motion conversion</li> <li>I can illustrate input/output motion using diagrams</li> <li>I can match real-world devices to the appropriate motion transformation</li> </ul>	
6	I can design systems that manipulate speed, torque, or direction of motion using mechanical components.	<ul style="list-style-type: none"> <li>I can calculate gear ratios, torque, and speed changes in mechanisms</li> </ul>	

		<ul style="list-style-type: none"> <li>• I can modify a mechanism to meet design criteria (e.g., increase torque or speed)</li> <li>• I can build and test a prototype that controls or changes motion</li> <li>• I can explain design choices using mechanical reasoning</li> </ul>
7	I can use the engineering design process and my knowledge of machines and mechanisms to develop a functional solution to a real-world problem.	<ul style="list-style-type: none"> <li>• I can identify a real-world problem that can be addressed with mechanical systems</li> <li>• I can use the engineering design process to brainstorm, design, build, and test a solution</li> <li>• I can integrate knowledge of machines and mechanisms into my design</li> <li>• I can evaluate and refine the solution based on performance data</li> </ul>

<b>Unit Title:</b>		
Unit 2: Application of Robotics		
<b>Relevant Standards: Bold indicates priority</b>		
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards <b>Standards for Technological and Engineering Literacy</b>		
<b>Essential Question(s):</b>		<b>Enduring Understanding(s):</b>
2.1 - 1 What characteristics define a robot? 2.2 - 1 What practices do programmers use to write effective code? 2.2 - 2 How do engineers use sensors to solve design problems? 2.3 - 1 What is artificial intelligence, and how do engineers use it to solve problems? 2.3 - 2 What are some of the ethical implications of artificial intelligence? 2.4 - 1 How can you apply your understanding of mechanics and programming to solve a design problem?		Engineers integrate mechanical systems, programming, and sensors to design intelligent, responsive robots that solve real-world problems. By understanding how robots function, how to write efficient code, and how to apply artificial intelligence ethically and effectively, students are empowered to create solutions that interact with the physical world in meaningful and innovative ways.
<b>Demonstration of Learning:</b>		<b>Pacing for Unit</b>
- Written documents, Formative and Summative Assessment, Hands on activities		18 Class Periods
<b>Family Overview (link below)</b>		<b>Integration of Technology:</b>
<a href="#">Family Overview - PLTW Principles of Engineering</a> <a href="#">Family Overview - PLTW Principles of Engineering (Spanish)</a>		N/A
<b>Unit-specific Vocabulary:</b>		<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Automation Actuator Algorithm Artificial Intelligence (AI) Sensor Servo Motor Mechanical Engineering Programming Language	Feedback Loop End Effector Computer Vision Machine Learning Data Processing Binary Code Prototyping Simulation Microcontroller Control System	Torque Kinematics Feedback Mechanism Ethical Engineering Precision Engineering Human-Computer Interaction Cognitive Computing
<b>Opportunities for Interdisciplinary Connections:</b>		<b>Anticipated misconceptions:</b>
<ul style="list-style-type: none"> <li>Students can apply algebra and geometry concepts in programming logic, control systems, and sensor data processing (e.g., using equations to program motion paths or understand angular displacement in robotics).</li> </ul>		<ul style="list-style-type: none"> <li>Robots are only machines that look human.</li> <li>AI is a single, all-knowing system.</li> <li>Robots are always autonomous and do not need human control.</li> <li>Programming is only about writing code.</li> <li>All AI systems are the same.</li> </ul>

<ul style="list-style-type: none"> <li>Understanding of mechanics and physical forces (e.g., Newton's laws, force, and motion) can be applied to how robots interact with their environments, especially in designing robotic arms or autonomous vehicles.</li> <li>Exploring the societal and ethical implications of artificial intelligence, especially as it relates to job automation, privacy, and safety.</li> </ul>						
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>					
<ul style="list-style-type: none"> <li>Unit 2 builds on the product development process from Unit 0 by applying the design, prototyping, and testing concepts to robotics.</li> <li>Knowledge of user needs and concept sketches in Unit 0 are used to design functional robots in Unit 2.</li> <li>Unit 2 applies mechanical design principles from Unit 1 (e.g., force, motion, actuators) to build robotic systems.</li> <li>Students use mechanical design knowledge from Unit 1 to create the physical structures and movements of robots (e.g., joints, frames, gears).</li> </ul>	<ul style="list-style-type: none"> <li>Robotics systems in Unit 2 require energy management for powering actuators, sensors, and motors, which connects to energy principles explored in Unit 3.</li> <li>Robotics from Unit 2 can be applied to sustainable infrastructure projects, improving efficiency and reducing waste in sectors like construction and agriculture.</li> <li>Robotics plays a role in sustainable design by automating tasks and optimizing resource usage, which ties into the sustainability focus of Unit 4.</li> </ul>					
<b>Differentiation through <i>Universal Design for Learning</i></b>						
<b>UDL Indicator</b>	<b>Teacher Actions:</b>					
<p>Representation</p> <ul style="list-style-type: none"> <li>Provide a variety of learning materials such as videos, interactive simulations, diagrams, and hands-on activities (e.g., robot building, coding exercises) to engage different types of learners. Use accessible language and scaffolding techniques when explaining complex concepts like AI and programming.</li> </ul> <p>Engagement</p> <ul style="list-style-type: none"> <li>Allow students to choose a specific robot design problem or coding project based on their interests, encouraging creativity and autonomy. Provide real-world examples of how robotics and AI solve problems in various industries to emphasize relevance.</li> </ul> <p>Action &amp; Expression</p> <ul style="list-style-type: none"> <li>Encourage students to demonstrate their understanding of concepts through a variety of formats: presentations, videos, written reports, or building prototypes. For example, students could present a design proposal for a robot using diagrams and code, and explain its function to the class.</li> </ul>						
<b>Supporting Multilingual/English Learners</b>						
<b>Related <i>CELP standards:</i></b>	<b>Learning Targets:</b>					
<b>CELP Standard</b>	<b>LT 1</b>	<b>LT 2</b>	<b>LT 3</b>	<b>LT 4</b>	<b>LT 5</b>	<b>LT 6</b>
1. Construct meaning from oral presentations and literary and informational text	X	X	X	X	X	X
2. Participate in grade-appropriate oral and written exchanges of information, ideas, and analyses	X	X	X	X	X	X
3. Speak and write about grade-appropriate complex literary and informational texts and topics	X	X	X	X	X	X
4. Construct grade-appropriate oral and written claims and support them with reasoning and evidence	X	X	X	X	X	X
5. Conduct research and evaluate and communicate findings to answer questions or solve problems	X	X	X	X	X	X
6. Analyze and critique the arguments of others orally and in writing		X		X	X	
7. Adapt language choices to purpose, task, and	X	X	X	X	X	X

audience when speaking and writing						
8. Determine the meaning of words and phrases in oral presentations and literary and informational text	X	X	X	X	X	X
9. Create clear and coherent grade-appropriate speech and text	X	X	X	X	X	X
10. Make accurate use of standard English to communicate in grade appropriate speech and writing	X	X	X	X	X	X

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can explain the key characteristics that define a robot, including its ability to perform tasks autonomously or semi-autonomously through sensors, actuators, and programming.	<ul style="list-style-type: none"> <li>I can identify at least three characteristics that define a robot (e.g., sensors, actuators, programming).</li> <li>I can provide an example of a robot and explain how it fits the definition based on these characteristics.</li> <li>I can distinguish between robots and other automated machines.</li> </ul>	
2	I can describe best practices for writing effective code, including problem-solving techniques, debugging, and organizing code for efficiency and clarity.	<ul style="list-style-type: none"> <li>I can explain the steps of the programming process (e.g., planning, writing, testing, debugging).</li> <li>I can identify common practices like using comments, breaking down problems into smaller steps, and modularizing code.</li> <li>I can demonstrate debugging skills by identifying and fixing an error in a simple program.</li> </ul>	
3	I can explain how engineers use different types of sensors (e.g., temperature, pressure, motion) to collect data and solve design challenges.	<ul style="list-style-type: none"> <li>I can describe at least two types of sensors and their functions in a robotic system or engineering design.</li> <li>I can explain how sensor data informs decision-making in engineering projects (e.g., adjusting a robot's movement based on distance or obstacles).</li> <li>I can demonstrate how to use a sensor in a simple engineering project to collect and apply data to solve a problem.</li> </ul>	
4	I can define artificial intelligence and describe how engineers apply AI to solve real-world problems (e.g., automation, predictive modeling, autonomous vehicles).	<ul style="list-style-type: none"> <li>I can provide a clear definition of AI and distinguish it from basic programming or automation.</li> <li>I can explain at least two ways engineers use AI to solve problems (e.g., object recognition in autonomous robots).</li> </ul> <p>I can apply AI concepts to a practical scenario, such as designing an AI-driven robot or system.</p>	
5	I can identify and analyze the ethical implications of artificial intelligence, including issues like privacy, job displacement, and bias.	<ul style="list-style-type: none"> <li>I can list at least three ethical concerns related to AI (e.g., privacy violations, biased algorithms).</li> <li>I can discuss real-world examples where AI raised ethical questions.</li> <li>I can engage in a discussion or debate on the ethical considerations of implementing AI in society, presenting both sides of the argument.</li> </ul>	
6	I can integrate principles of mechanics (e.g., force, motion) and programming to develop a solution to a design problem, such as creating a functional prototype.	<ul style="list-style-type: none"> <li>I can apply mechanical principles (e.g., using pulleys, gears, levers) to design and build a working mechanism.</li> <li>I can write and test code to control a system or prototype (e.g., programming a robotic arm to move).</li> </ul>	

- |  |  |   |
|--|--|---|
|  |  | <ul style="list-style-type: none"><li>• I can troubleshoot and improve the functionality of my design by refining both the mechanical structure and the code.</li></ul> |
|--|--|---|

<b>Unit Title:</b>	
Unit 3: Energy in Action	
<b>Relevant Standards: Bold indicates priority</b>	
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards <b>Standards for Technological and Engineering Literacy</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<p>3.1 - 1 How do you differentiate between circuit types? 3.1 - 2 How do you model electrical circuits? 3.1 - 3 How do you test circuit parameters? 3.1 - 4 What are the mathematical relationships between circuit parameters? 3.1 - 5 Why are Kirchhoff's Laws important to engineers and designers of electrical circuits? 3.2 - 1 What impact does fluid power have on our everyday lives? 3.2 - 2 What devices or systems might be improved with the use of fluid power? 3.2 - 3 What are the similarities and differences of mechanical advantage in simple machines? 3.2 - 4 Why are Pascal's Law, the perfect gas laws, Bernoulli's Principle, and other similar rules important to engineers and designers of fluid power systems? 3.3 - 1 How do we graph and analyze motion? 3.3 - 2 What equations govern how objects move? 3.3 - 3 How do we predict where projectiles will land?</p>	<ul style="list-style-type: none"> <li>The behavior of electrical circuits can be understood and predicted through mathematical relationships like Ohm's Law and Kirchhoff's Laws. These laws are essential for designing and analyzing electrical systems.</li> <li>Kirchhoff's Laws are critical for solving complex electrical circuits, ensuring the conservation of current and voltage. They are fundamental for engineers when working with circuits that have multiple components.</li> <li>Fluid power systems (hydraulic and pneumatic) are essential in industries and everyday devices, offering powerful solutions for tasks requiring force multiplication and control. Understanding fluid dynamics helps engineers design efficient systems.</li> <li>Simple machines, like levers and pulleys, use mechanical advantage to reduce the amount of force needed to accomplish tasks. Understanding this principle helps engineers design systems that maximize efficiency.</li> <li>Fluid dynamics principles, such as Pascal's Law and Bernoulli's Principle, are foundational for designing and optimizing hydraulic and pneumatic systems used in a wide range of applications.</li> <li>The motion of objects is governed by physical laws that can be described and predicted with mathematical equations. Understanding these laws is key to designing systems involving movement, like in mechanical and transportation engineering.</li> <li>The behavior of projectiles can be predicted using kinematic equations, which account for both horizontal and vertical motion. Engineers use this to design systems that require trajectory planning, such as in robotics or aerospace.</li> </ul>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>Written documents, Formative and Summative Assessment, Hands on activities</li> </ul>	17 Class Periods
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>
<a href="#">Family Overview - PLTW Principles of Engineering</a> <a href="#">Family Overview - PLTW Principles of Engineering (Spanish)</a>	N/A
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology</b>

			(beyond core resources):
Voltage	Inductance	Mechanical	N/A
Current	Kirchhoff's	Advantage	
Resistance	Current Law (KCL)	Simple Machines	
Ohm's Law	Kirchhoff's	Force	
Circuit	Voltage Law (KVL)	Velocity	
Series Circuit	Fluid Power	Acceleration	
Parallel Circuit	Hydraulic Systems	Projectile Motion	
Power (in circuits)	Pneumatic	Kinematics	
Capacitance	Systems	Work-Energy	
Pascal's Law	Bernoulli's	Theorem	
	Principle		
Opportunities for Interdisciplinary Connections:			Anticipated misconceptions:
<ul style="list-style-type: none"> <li>Understanding the mathematical relationships in circuits (Ohm's Law, Kirchhoff's Laws) requires algebra, and graphing motion involves geometric concepts (such as the trajectory of projectiles).</li> <li>Fluid power systems rely on principles from fluid dynamics, such as Pascal's Law and Bernoulli's Principle, while motion analysis draws on kinematics and forces.</li> </ul>			<ul style="list-style-type: none"> <li>In a series circuit, the current is different across each component.</li> <li>Hydraulic and pneumatic systems work the same way because both use pressure.</li> <li>The mechanical advantage of a machine is always greater than 1.</li> <li>Projectiles move in a straight line when thrown.</li> <li>Resistance always increases with temperature in a circuit.</li> </ul>
Connections to Prior Units:			Connections to Future Units:
<ul style="list-style-type: none"> <li>Unit 3 builds on the design process from Unit 0 by applying energy principles to create functional and efficient products.</li> <li>Knowledge from Unit 0 about prototyping and iterative testing informs how energy-efficient systems are tested and improved in Unit 3.</li> <li>Energy principles in Unit 3 complement mechanical design concepts from Unit 1, where energy is transferred and converted within mechanical systems.</li> <li>Understanding mechanical components, such as gears, pulleys, and levers from Unit 1, is essential for analyzing energy flow and efficiency in systems like engines or machines in Unit 3.</li> <li>Unit 3 connects to Unit 2 as robotics systems often rely on energy sources, including electrical power and mechanical energy, to function.</li> <li>Understanding how energy is used in robotics, such as motors and sensors, from Unit 2 ties directly into the energy analysis and optimization discussed in Unit 3.</li> </ul>			<ul style="list-style-type: none"> <li>In Unit 3, energy principles are directly applied to energy-efficient systems, which ties into the sustainability focus of Unit 4. Students will learn how to design sustainable infrastructure that uses energy more effectively and reduces waste.</li> <li>Energy systems discussed in Unit 3, such as renewable energy sources, will be foundational for creating sustainable infrastructure in Unit 4.</li> </ul>
Differentiation through <a href="#">Universal Design for Learning</a>			
UDL Indicator		Teacher Actions:	
Representation			
<ul style="list-style-type: none"> <li>Use diagrams, circuit simulations, and interactive models to visually represent circuit behavior. Include verbal explanations of the key concepts while encouraging hands-on experiments to demonstrate circuit testing and fluid power systems.</li> </ul>			
Engagement			

- Provide students with choices in project topics, such as designing a fluid power system or creating a working electrical circuit. Relate activities to real-world applications like hydraulics in construction or electrical circuits in electronics.

Action & Expression

- Allow students to present their findings in various formats, such as diagrams, written reports, or presentations. Encourage group work where students can build a physical prototype and explain its function in front of the class.

**Supporting Multilingual/English Learners**

**Related CELP standards:**

**Learning Targets:**

CELP Standard	LT 1	LT 2	LT 3	LT 4	LT 5	LT 6	LT 7	LT 8	LT 9	LT 10	LT 11	LT 12
1. Construct meaning from oral presentations and literary and informational text	X	X	X	X	X	X	X	X	X	X	X	X
2. Participate in grade-appropriate oral and written exchanges of information, ideas, and analyses	X	X	X	X	X	X	X	X	X	X	X	X
3. Speak and write about grade-appropriate complex literary and informational texts and topics	X	X	X	X	X	X	X	X	X	X	X	X
4. Construct grade-appropriate oral and written claims and support them with reasoning and evidence	X	X	X	X	X	X	X	X	X	X	X	X
5. Conduct research and evaluate and communicate findings to answer questions or solve problems	X	X	X	X	X	X	X	X	X	X	X	X
6. Analyze and critique the arguments of others orally and in writing	X		X	X	X		X	X	X	X	X	X
7. Adapt language choices to purpose, task, and audience when speaking and writing	X	X	X	X	X	X	X	X	X	X	X	X
8. Determine the meaning of words and phrases in oral presentations and literary and informational text	X	X	X	X	X	X	X	X	X	X	X	X
9. Create clear and coherent grade-appropriate speech and text	X	X	X	X	X	X	X	X	X	X	X	X
10. Make accurate use of standard English to communicate in grade appropriate speech and writing	X	X	X	X	X	X	X	X	X	X	X	X

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can identify and explain the differences between series and parallel circuits based on their electrical properties and behavior.	<ul style="list-style-type: none"> <li>• I can distinguish between series and parallel circuits. I can explain how current and voltage behave differently in each type of circuit.</li> </ul>	
2	I can create accurate diagrams of electrical circuits using standard symbols and explain the components and their connections.	<ul style="list-style-type: none"> <li>• I can draw a circuit diagram that follows proper electrical symbols. I can explain the function of each component in a circuit diagram.</li> </ul>	
3	I can measure voltage, current, and resistance in a circuit and analyze the results.	<ul style="list-style-type: none"> <li>• I can use a multimeter to measure voltage, current, and resistance. I can interpret the measurements to identify problems or optimize circuit performance.</li> </ul>	
4	I can apply Ohm's Law and other mathematical equations to calculate and	<ul style="list-style-type: none"> <li>• I can calculate voltage, current, and resistance in a circuit using Ohm's Law.</li> </ul>	

	analyze circuit parameters.	<ul style="list-style-type: none"> <li>I can apply Kirchhoff's Laws to solve for unknown circuit parameters.</li> </ul>
5	I can explain the importance of Kirchhoff's Current and Voltage Laws in analyzing complex circuits.	<ul style="list-style-type: none"> <li>I can apply Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL) to solve circuit problems.</li> <li>I can explain how these laws ensure that circuits are designed correctly and safely.</li> </ul>
6	I can identify how fluid power systems are used in everyday devices and industries.	<ul style="list-style-type: none"> <li>I can list at least three devices or systems that use fluid power.</li> <li>I can explain the benefits of fluid power in industrial application</li> </ul>
7	I can describe how fluid power can improve the performance and efficiency of mechanical systems.	<ul style="list-style-type: none"> <li>I can identify a system or device that can be improved by fluid power.</li> <li>I can explain how the use of fluid power improves system performance.</li> </ul>
8	I can compare and contrast the mechanical advantage in simple machines (e.g., levers, pulleys).	<ul style="list-style-type: none"> <li>I can define mechanical advantage and explain how it works in different simple machines.</li> <li>I can calculate the mechanical advantage in various simple machine systems.</li> </ul>
9	I can explain the role of fundamental fluid dynamics principles (Pascal's Law, Bernoulli's Principle) in fluid power systems.	<ul style="list-style-type: none"> <li>I can explain Pascal's Law and Bernoulli's Principle in the context of fluid power systems.</li> <li>I can describe how these principles are used to design efficient fluid power systems.</li> </ul>
10	I can graph and interpret the motion of objects, including displacement, velocity, and acceleration.	<ul style="list-style-type: none"> <li>I can create motion graphs (e.g., position vs. time, velocity vs. time).</li> <li>I can analyze the graphs to describe the object's motion.</li> </ul>
11	I can apply kinematic equations to solve problems involving the motion of objects.	<ul style="list-style-type: none"> <li>I can use the kinematic equations to calculate displacement, velocity, and acceleration.</li> <li>I can explain how these equations relate to the real-world motion of objects.</li> </ul>
12	I can apply projectile motion equations to predict the landing location of a projectile.	<ul style="list-style-type: none"> <li>I can use the horizontal and vertical motion equations to solve projectile motion problems.</li> <li>I can predict the range of a projectile given its initial velocity and angle of launch.</li> </ul>

Unit Title:	
Unit 4: Designing Infrastructure and Developing Sustainability	
Relevant Standards: Bold indicates priority	
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards <b>Standards for Technological and Engineering Literacy</b>	
Essential Question(s):	Enduring Understanding(s):
<p>4.1 - 1 What factors impact beam deflection? 4.1 - 2 Why is the value of beam deflection useful? 4.1 - 3 What are the properties of structural members and why are they useful? 4.1 - 4 What is a centroid and how is it applied in structural members? 4.1 - 5 Why is it crucial for designers and engineers to construct accurate free body diagrams of the parts and structures that they design? 4.1 - 6 Why must designers and engineers calculate forces acting on bodies and structures? 4.1 - 7 What are the differences between stress and strain? 4.1 - 8 Why are stress and strain important factors to consider when designing? 4.1 - 9 How does the stress-strain curve help engineers during tensile testing? 4.1 - 7 What is a moment and how does it help solve problems in static structures? 4.1 - 8 When solving truss forces, why is it important to know that the structure is statically determinate? 4.1 - 9 How is the method of joints used to determine internal forces in trusses? 4.1 - 10 How do material properties affect structural stability, internal forces, and cost? 4.2 - 1 What are renewable and nonrenewable resources and how do humans use them? 4.2 - 2 In what innovative ways could the efficiency of electricity production using solar cells be maximized throughout the day? 4.3 - 1 What factors affect the rate of flow on a roadway? 4.3 - 2 How is the optimum speed limit determined for a roadway? 4.3 - 3 In your opinion, what type of intersection is prone to the most accidents? What can be done to maximize safety at this type of intersection? 4.4 - 1 What role does creativity have in the engineering design process? 4.4 - 2 What do engineers do to clearly document and communicate their work? Why is this important? 4.4 - 3 How are different elements of infrastructure related?</p>	<ul style="list-style-type: none"> <li>● Beam deflection is influenced by material properties, geometry, and load distribution, and understanding these factors is essential for designing stable and functional structures.</li> <li>● Beam deflection is a critical parameter that ensures structures perform without excessive bending or failure, aiding in the optimization of design for strength and safety.</li> <li>● The properties of structural members, such as strength, elasticity, and stiffness, determine their performance under load and are essential for safe and efficient design.</li> <li>● The centroid is essential for structural analysis, helping determine the distribution of forces and moments, enabling more efficient and balanced design.</li> <li>● Free body diagrams are vital tools for understanding and calculating the forces and moments acting on structures, ensuring accurate and reliable design analysis.</li> <li>● Calculating forces is fundamental to structural design, allowing engineers to ensure stability and prevent failure under expected load conditions.</li> <li>● Stress and strain describe how materials respond to forces, and understanding their relationship is key to selecting appropriate materials and ensuring structural integrity.</li> <li>● The stress-strain curve aids in understanding material behavior under tension, helping engineers choose materials that are best suited for specific structural requirements.</li> <li>● Creativity is integral to the engineering design process, enabling innovative solutions to complex problems and contributing to the development of efficient, sustainable designs.</li> <li>● Different infrastructure systems are interrelated, requiring an integrated approach to design to ensure that transportation, energy, and other systems function together effectively.</li> </ul>
Demonstration of Learning:	Pacing for Unit

<ul style="list-style-type: none"> <li>Written documents, Formative and Summative Assessment, Hands on activities</li> <li>Students work collaboratively in teams to develop solutions to structural design problems, sustainable approaches, and transportation design needs that have a lasting impact on local and global communities.</li> <li>Students conclude their career exploration by examining the future of different careers and how they will be affected by the adoption of artificial intelligence.</li> </ul>	20 Class Periods																																				
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>																																				
<a href="#">Family Overview - PLTW Principles of Engineering</a> <a href="#">Family Overview - PLTW Principles of Engineering (Spanish)</a>	N/A																																				
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>																																				
<table border="1"> <tr> <td>Reaction Force</td> <td>Moment</td> <td>Shear Force</td> </tr> <tr> <td>Stress</td> <td>Truss</td> <td>Bending Moment</td> </tr> <tr> <td>Strain</td> <td>Statically</td> <td>Axial Force</td> </tr> <tr> <td>Tensile Testing</td> <td>Determinate</td> <td>Plastic</td> </tr> <tr> <td>Stress-Strain</td> <td>Method of Joints</td> <td>Deformation</td> </tr> <tr> <td>Curve</td> <td>Internal Forces</td> <td>Ultimate Strength</td> </tr> <tr> <td>Elasticity</td> <td>Material</td> <td>Elastic</td> </tr> <tr> <td>Modulus of</td> <td>Properties</td> <td>Deformation</td> </tr> <tr> <td>Elasticity</td> <td>Structural</td> <td>Beam Deflection</td> </tr> <tr> <td>Free Body</td> <td>Member</td> <td>Load Distribution</td> </tr> <tr> <td>Diagram (FBD)</td> <td>Centroid</td> <td></td> </tr> <tr> <td>Force</td> <td></td> <td></td> </tr> </table>	Reaction Force	Moment	Shear Force	Stress	Truss	Bending Moment	Strain	Statically	Axial Force	Tensile Testing	Determinate	Plastic	Stress-Strain	Method of Joints	Deformation	Curve	Internal Forces	Ultimate Strength	Elasticity	Material	Elastic	Modulus of	Properties	Deformation	Elasticity	Structural	Beam Deflection	Free Body	Member	Load Distribution	Diagram (FBD)	Centroid		Force			N/A
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<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>																																				
<ul style="list-style-type: none"> <li>The principles of force, moment, and stress/strain tie directly into basic mechanics. Students will apply these concepts when analyzing and solving problems in both static and dynamic systems.</li> <li>Calculating beam deflection, moments, and force distributions involves algebra and calculus to solve equations that model physical systems.</li> <li>Concepts from structural analysis in Unit 4 can be connected to renewable energy systems, particularly in the design and analysis of structures like wind turbines and solar panels.</li> </ul>	<ul style="list-style-type: none"> <li>Beam deflection is always proportional to the load applied.</li> <li>Stress and strain are the same thing. If a structure doesn't fail immediately under a load, it's safe. Free body diagrams are only for static systems. Material properties are the same for all applications.</li> </ul>																																				
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>																																				
<ul style="list-style-type: none"> <li>Unit 4 builds on the product design process from Unit 0, applying it to the design of sustainable infrastructure and energy-efficient systems, emphasizing real-world application and iterative testing.</li> <li>The principles of mechanical design from Unit 1 are used to ensure the structural integrity and functionality of infrastructure systems in Unit 4, including material selection and load distribution.</li> <li>Robotics concepts from Unit 2 connect to infrastructure design in Unit 4, where automation</li> </ul>	N/A																																				

and robotic systems could be integrated into the construction and maintenance of infrastructure for increased efficiency.

- Unit 4 extends the energy principles explored in Unit 3, focusing on renewable energy sources and sustainable design practices, such as wind, solar, and energy-efficient building methods.

**Differentiation through *Universal Design for Learning***

**UDL Indicator** | **Teacher Actions:**

- Representation
- Use diagrams and interactive models to demonstrate how forces act on beams and structures. Encourage students to use physical models or simulations to test different loads and observe beam deflection.
- Engagement
- Provide students with project options that connect to real-world applications, such as designing a bridge or analyzing the forces on a building. This helps engage students by showing the relevance of structural analysis to everyday life.
- Action & Expression
- Allow students to express their understanding through various formats, such as written reports, presentations, or physical prototypes. This supports different learning styles and helps students engage with the material in diverse ways.

**Supporting Multilingual/English Learners**

**Related *CELP standards:*** | **Learning Targets:**

CELP Standard	LT 1	LT 2	LT 3	LT 4	LT 5	LT 6	LT 7	LT 8	LT 9	LT 10	LT 11	LT 12
1. Construct meaning from oral presentations and literary and informational text	X	X	X	X	X	X	X	X	X	X	X	X
2. Participate in grade-appropriate oral and written exchanges of information, ideas, and analyses	X	X	X	X	X	X	X	X	X	X	X	X
3. Speak and write about grade-appropriate complex literary and informational texts and topics	X	X	X	X	X	X	X	X	X	X	X	X
4. Construct grade-appropriate oral and written claims and support them with reasoning and evidence	X	X	X	X	X	X	X	X	X	X	X	X
5. Conduct research and evaluate and communicate findings to answer questions or solve problems	X	X	X	X	X	X	X	X	X	X	X	X
6. Analyze and critique the arguments of others orally and in writing	X	X	X	X	X	X	X	X	X	X	X	X
7. Adapt language choices to purpose, task, and audience when speaking and writing	X	X	X	X	X	X	X	X	X	X	X	X
8. Determine the meaning of words and phrases in oral presentations and literary and informational text	X	X	X	X	X	X	X	X	X	X	X	X
9. Create clear and coherent grade-appropriate speech and text	X	X	X	X	X	X	X	X	X	X	X	X
10. Make accurate use of standard English to communicate in grade appropriate speech and writing	X	X	X	X	X	X	X	X	X	X	X	X

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
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1	I can identify and explain the factors that influence beam deflection, including material properties, load distribution, and beam geometry.	<ul style="list-style-type: none"> <li>I can list factors affecting beam deflection and explain their impact using examples.</li> </ul>
2	I can explain why beam deflection is a critical parameter in structural design.	<ul style="list-style-type: none"> <li>I can discuss how deflection affects the performance and safety of structures.</li> </ul>
3	I can identify and explain the material properties (strength, stiffness, elasticity) that influence the performance of structural members.	<ul style="list-style-type: none"> <li>I can describe how material properties affect design decisions in structural engineering.</li> </ul>
4	I can explain what a centroid is and how it is used in calculating moments and load distributions.	<ul style="list-style-type: none"> <li>I can calculate the centroid of simple shapes and apply it to structural analysis.</li> </ul>
5	I can describe the purpose and process of creating free body diagrams for structural analysis.	<ul style="list-style-type: none"> <li>I can create a free body diagram for a simple structure and use it to solve for unknown forces.</li> </ul>
6	I can explain the importance of calculating forces in the design and safety of structures.	<ul style="list-style-type: none"> <li>I can calculate the forces acting on a structure using known loads and support conditions.</li> </ul>
7	I can explain the difference between stress and strain and describe how they are related.	<ul style="list-style-type: none"> <li>I can apply the concepts of stress and strain to real-world materials and structural problems.</li> </ul>
8	I can explain why considering stress and strain is crucial for material selection and ensuring structural integrity.	<ul style="list-style-type: none"> <li>I can use the concepts of stress and strain to evaluate whether a material is suitable for a specific application.</li> </ul>
9	I can interpret the stress-strain curve and explain how it helps engineers assess material performance during tensile testing.	<ul style="list-style-type: none"> <li>I can identify key points on a stress-strain curve (yield strength, ultimate strength) and explain their significance.</li> </ul>
10	I can define a moment and explain its role in solving problems involving static structures.	<ul style="list-style-type: none"> <li>I can calculate moments acting on a structure and use them to determine the stability of the system.</li> </ul>
11	I can explain the concept of statically determinate structures and why it is important for solving truss forces.	<ul style="list-style-type: none"> <li>I can identify whether a truss is statically determinate and explain how this impacts the solution process.</li> </ul>
12	I can analyze how different material properties (e.g., strength, elasticity) affect structural stability and cost.	<ul style="list-style-type: none"> <li>I can select appropriate materials for a structure based on their properties and the requirements of the design.</li> </ul>

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
PLTW Introduction to Engineering and Design	CTE: Engineering and Technology	9-12	1 Credit 2 College credits through University of New Haven upon meeting UNH criteria

**Course Description:**

Introduction to Engineering Design (IED) is a high school engineering course in the PLTW Engineering Program. In IED, students explore engineering tools and apply a common approach to the solution of engineering problems, an engineering design process. Utilizing the activity-project-problem-based (APB) teaching and learning pedagogy, students progress from completing structured activities to solving open-ended projects and problems that require them to plan, document, communicate, and develop other professional skills.

Through both individual and collaborative team activities, projects, and problems, students apply systems thinking and consider various aspects of engineering design including material selection, human-centered design, manufacturability, assemblability and sustainability. Students develop skills in technical representation and documentation especially through 3D computer modeling using a Computer Aided Design (CAD) application. As part of the design process, students produce precise 3D-printed engineering prototypes using an additive manufacturing process. Student-developed testing protocols drive decision-making and iterative design improvements.

To inform design and problem solutions addressed in IED, students apply computational methods to inform design by developing algorithms, performing statistical analyses, and developing mathematical models. Students build competency in professional engineering practices including project management, peer review, and environmental impact analysis as part of a collaborative design team. Ethical issues related to professional practice and product development are also presented.

**Aligned Core Resources:**

<ul style="list-style-type: none"> <li>● <a href="#">PLTW Online</a> (some elements require PLTW login credentials)</li> <li>● <a href="#">Course Outline - PLTW Intro to Engineering Design</a></li> <li>● Common Core State Standards for English Language Arts</li> <li>● Common Core State Standards for Mathematics</li> <li>● Next Generation Science Standards</li> <li>● Standards for Technological and Engineering Literacy</li> </ul>	<p><b>Connection to the <i>BPS Vision of the Graduate</i></b></p> <p><b>Meaningfully contribute to a global society:</b> Collaboration</p> <p><b>Effectively communicate in a global society:</b> Communications and Technology Literacy</p> <p><b>Demonstrate Academic Knowledge and Skills:</b> Critical Thinking and Problem Solving</p>
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**Additional Course Information:**  
*Knowledge/Skill Dependent courses/prerequisites*

Concurrent enrollment in grade-appropriate mathematics class.	Link to <a href="#">Completed Equity Audit</a> <a href="#">Equity Curriculum Review - PLTW Intro to Engineering Design (2024-25)</a>
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**Standard Matrix**

See [Standards Alignment - PLTW Intro to Engineering Design](#) for alignment to:

- Common Core State Standards for English Language Standards (Page 2)
  - Anchor Standards: Research to Build and Present Knowledge
  - Writing: Text Types and Purposes
  - Reading Informational Text: Key Ideas and Details
- Common Core State Standards for Mathematics (Page 12)
  - Geometry: Visualization and Spatial Reasoning
  - Statistics and Probability: Interpreting Categorical and Quantitative Data
  - Statistics and Probability: Making Inferences and Justifying Conclusions
  - Number and Quantity: Quantities
- Next Generation Science Standards (Page 19)
  - Engineering Design: Developing Possible Solutions
  - Engineering Design: Evaluating Solutions
  - Engineering Design: Analyzing and Interpreting Data
  - Engineering Design: Optimizing the Design Solution
  - Engineering Design: Developing and Using Models
- Standards for Technological and Engineering Literacy (Page 29)
  - Creativity and Innovation
  - Communication and Collaboration
  - Understanding and Applying Engineering Concepts
  - Global Awareness in Engineering

- Technology and Engineering in Design
- Collaboration and Teamwork

## Unit Links

[Unit 1: Design and Problem Solving](#)

[Unit 2: Assembly Design](#)

[Unit 3: Thoughtful Product Design](#)

[Unit 4: Making Things Move](#)

<b>Unit Title:</b>	
Unit 1: Design and Problem Solving	
<b>Unit Description:</b>	
Unit 1 provides an overview of the engineering design process and helps students develop an understanding of the purpose and practice of modeling in engineering communication. Students are introduced to modeling methods and practice modeling skills important to the design of mechanical systems including technical sketching, 3D solid modeling and technical drawing using Computer-Aided Design (CAD), statistical analysis, and prototyping. Emphasis is placed on building CAD skills applied throughout the course. In addition, students learn statistical techniques to evaluate design solutions and apply statistics to inform the design of a game.	
<b>Relevant Standards: Bold indicates priority</b>	
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards <b>Standards for Technological and Engineering Literacy</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ol style="list-style-type: none"> <li>1. What are effective ways to generate potential solutions to a problem?</li> <li>2. When solving an engineering problem, how can you reasonably ensure you have created the best solution possible?</li> <li>3. How is technical drawing similar to and different from artistic drawing?</li> <li>4. In what ways can technical drawings help or hinder communication in a global community?</li> <li>5. Why are spatial visualization skills crucial to engineering success?</li> <li>6. What advantages does Computer-Aided Design (CAD) provide over traditional paper and pencil design?</li> <li>7. What would happen if engineers did not follow accepted dimensioning standards and guidelines, but instead, used their own individual dimensioning methods?</li> <li>8. Why do engineers use models? How reliable is a model?</li> <li>9. Is it ever advantageous to create a design or solve a problem individually as opposed to using a team approach?</li> </ol>	<ol style="list-style-type: none"> <li>1. Generating potential solutions involves a variety of brainstorming techniques and collaborative methods that encourage creativity and diverse perspectives, allowing for a more comprehensive problem-solving process.</li> <li>2. Ensuring the best solution involves systematic evaluation through criteria such as feasibility, efficiency, cost-effectiveness, and sustainability, as well as iterative testing and feedback cycles.</li> <li>3. Recognize that while both technical and artistic drawings serve to communicate ideas, technical drawings prioritize precision, scale, and clarity to convey specific information, whereas artistic drawings focus on expression and visual interpretation.</li> <li>4. Technical drawings can enhance communication across cultures and languages by providing standardized symbols and dimensions, but may also hinder understanding if the audience lacks familiarity with technical standards.</li> <li>5. Spatial visualization skills are crucial for engineers as they allow for better understanding of complex designs and the ability to foresee potential issues in three-dimensional spaces.</li> <li>6. Computer-Aided Design (CAD) offers significant advantages over traditional methods, including enhanced accuracy, ease of modifications, streamlined collaboration, and the ability to simulate and visualize designs in a virtual environment.</li> <li>7. Not following accepted dimensioning standards could lead to misinterpretation of designs, resulting in errors in construction or manufacturing, and potentially jeopardizing safety and project success.</li> <li>8. Engineers use models to simplify and test designs, but the reliability of a model can vary based on its fidelity to the real-world system it represents and the assumptions made during its creation.</li> <li>9. Recognize that while individual work can foster innovation and personal accountability, teamwork often leads to richer insights and more robust</li> </ol>

	solutions.																			
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>																			
Students demonstrate learning by applying the engineering design process to solve a real-world problem, showcasing their ability to identify design constraints, brainstorm solutions, create detailed sketches and technical drawings, build a prototype, test and iterate on their design, and effectively communicate their process and findings through written documentation and presentations; all while adhering to engineering ethics and professional practices.	40 Full Class Periods																			
<b>Family Overview (link below)</b>	<b>Integration of Technology:</b>																			
<a href="#">Family Overview - PLTW Intro to Engineering Design</a> <a href="#">Family Overview - PLTW Intro to Engineering Design (Spanish)</a>	MasterCam CAD Software																			
<b>Unit-specific Vocabulary:</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>																			
<table border="1"> <tr> <td>Design process</td> <td>Iterate</td> <td>Assess</td> </tr> <tr> <td>Design brief</td> <td>Research</td> <td>Justification</td> </tr> <tr> <td>Constraints</td> <td>Client</td> <td>Valid</td> </tr> <tr> <td>Criteria</td> <td>Design statement</td> <td>Product</td> </tr> <tr> <td>Problem identification</td> <td>Engineer</td> <td>CAD (Computer Aided Design)</td> </tr> <tr> <td>Brainstorm</td> <td>Innovation</td> <td>Prototype</td> </tr> </table>	Design process	Iterate	Assess	Design brief	Research	Justification	Constraints	Client	Valid	Criteria	Design statement	Product	Problem identification	Engineer	CAD (Computer Aided Design)	Brainstorm	Innovation	Prototype	N/A	
Design process	Iterate	Assess																		
Design brief	Research	Justification																		
Constraints	Client	Valid																		
Criteria	Design statement	Product																		
Problem identification	Engineer	CAD (Computer Aided Design)																		
Brainstorm	Innovation	Prototype																		
<b>Opportunities for Interdisciplinary Connections:</b>	<b>Anticipated misconceptions:</b>																			
<ul style="list-style-type: none"> <li>• Statistical Analysis: Students use mathematical concepts such as mean, standard deviation, and probability to evaluate design solutions and optimize game performance.</li> <li>• Geometric Principles: Applying concepts like transformations, symmetry, and coordinate geometry in CAD modeling and technical drawing.</li> <li>• Mechanics &amp; Forces: Understanding how forces affect mechanical systems and influence design choices.</li> <li>• Material Properties: Exploring the characteristics of materials used in prototyping and manufacturing, such as strength, durability, and flexibility.</li> <li>• Programming for CAD Automation: Using scripting and parametric design to create automated CAD models.</li> <li>• Data Analysis &amp; Visualization: Using spreadsheets or software to analyze statistical data related to design optimization.</li> <li>• Visual Communication: Developing technical sketching and drawing techniques to clearly communicate design intent.</li> <li>• Aesthetics &amp; User Experience: Considering color theory, ergonomics, and human-centered design principles in game development.</li> <li>• Product Development Process: Exploring how engineering designs transition from concept to production.</li> </ul>	<ul style="list-style-type: none"> <li>• Engineering follows a linear process rather than an iterative cycle of prototyping, testing, and refinement.</li> <li>• Simply using CAD guarantees a well-designed model, without understanding the importance of precise measurements, constraints, and iterative improvements.</li> <li>• Not appreciating freehand sketching to help with brainstorming, conceptualization, and quick problem-solving before using CAD software.</li> <li>• Struggle to see how statistical analysis informs design decisions, such as evaluating performance, optimizing features, and refining prototypes.</li> <li>• View failure as a negative outcome rather than a learning opportunity that leads to design improvements.</li> </ul>																			

<ul style="list-style-type: none"> <li>• Cost-Benefit Analysis: Evaluating manufacturing costs, material selection, and market demand when designing products.</li> </ul>	
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
N/A	<p><b>Unit 2: Assembly Design</b></p> <ul style="list-style-type: none"> <li>• The technical sketching, 3D solid modeling, and CAD skills developed in Unit 1 provide the foundation for creating and assembling multiple components in Unit 2. Students apply the engineering design process to understand how individual parts fit together into functional assemblies.</li> </ul> <p><b>Unit 3: Thoughtful Product Design</b></p> <ul style="list-style-type: none"> <li>• The problem-solving and iterative design skills from Unit 1 help students analyze user needs and constraints when designing products in Unit 3. Statistical techniques from Unit 1 will be used to evaluate product performance and optimize design solutions.</li> </ul> <p><b>Unit 4: Making Things Move</b></p> <ul style="list-style-type: none"> <li>• The modeling and prototyping techniques introduced in Unit 1 are essential for designing mechanical systems with moving parts in Unit 4. The foundational understanding of problem-solving and constraints from Unit 1 will help students develop functional and efficient mechanical designs.</li> </ul>
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<p>1. Representation</p> <ul style="list-style-type: none"> <li>• Visual Supports: Use diagrams, videos, and animations to illustrate engineering concepts and modeling techniques. This can help students better visualize complex ideas.</li> <li>• Text-to-Speech Tools: Incorporate software that reads technical documents and CAD instructions aloud, aiding comprehension for students with reading difficulties.</li> <li>• Graphical Organizers: Provide templates for students to organize information about the engineering design process, modeling techniques, and statistical methods visually.</li> <li>• Interactive Simulations: Utilize CAD software with simulation capabilities that allow students to manipulate models and visualize the effects of design changes in real-time.</li> </ul> <p>2. Engagement</p> <ul style="list-style-type: none"> <li>• Choice Boards: Create a menu of project options related to the engineering design process, allowing students to select projects that interest them and align with their strengths.</li> <li>• Collaborative Learning: Facilitate group projects where students can share ideas and work together on modeling and prototyping tasks. Encourage them to assign roles based on individual strengths.</li> <li>• Real-World Applications: Connect lessons to real-world engineering problems or current events, motivating students to see the relevance of what they are learning.</li> <li>• Gamification: Incorporate game elements into learning activities, such as competitions for the best design or innovative solution, to increase motivation and engagement.</li> </ul> <p>3. Action and Expression</p> <ul style="list-style-type: none"> <li>• Varied Project Formats: Allow students to choose how they demonstrate their learning, such as through presentations, videos, digital portfolios, or traditional reports.</li> <li>• Peer Review: Implement structured peer feedback sessions where students can share their CAD models and prototypes with classmates to receive constructive criticism and suggestions for improvement.</li> <li>• Reflection Journals: Encourage students to maintain a journal documenting their design process, challenges faced, and solutions found, promoting metacognitive skills and self-assessment.</li> <li>• Use of Technology: Provide access to various technical tools and software that allow students to express their designs and ideas creatively, whether through CAD, 3D printing, or digital modeling.</li> </ul>	

## Supporting Multilingual/English Learners

### Related CELP standards:

### Learning Targets:

1. I can apply brainstorming and structured problem-solving techniques to generate multiple possible solutions to an engineering problem.
  - Level 1: I can identify basic problem-solving techniques, such as brainstorming.
  - Level 2: I can use brainstorming to identify at least two possible solutions to an engineering problem.
  - Level 3: I can apply structured problem-solving methods to generate a variety of solutions for an engineering problem.
  - Level 4: I can evaluate and compare multiple solutions generated through brainstorming and problem-solving techniques.
  - Level 5: I can facilitate group brainstorming and structured problem-solving sessions, leading to innovative solutions for complex engineering problems.
2. I can use an iterative process to refine and improve design solutions based on data and testing.
  - Level 1: I can define what an iterative process is in engineering.
  - Level 2: I can explain the basic steps of an iterative design process.
  - Level 3: I can use an iterative process to make improvements to a design after testing and gathering data.
  - Level 4: I can integrate feedback from multiple iterations to refine a design.
  - Level 5: I can lead a team through a full iterative design process, using testing and data to continuously improve solutions.
3. I can explain the purpose and characteristics of technical drawings and how they differ from artistic drawings.
  - Level 1: I can identify the difference between technical and artistic drawings.
  - Level 2: I can describe the key characteristics of technical drawings, such as accuracy and precision.
  - Level 3: I can explain how technical drawings communicate detailed engineering information.
  - Level 4: I can discuss the role of technical drawings in ensuring safety and functionality in engineering.
  - Level 5: I can evaluate the effectiveness of technical drawings in communicating design intent.
4. I can analyze how standardized technical drawings enable clear communication across different cultures and industries.
  - Level 1: I can explain the concept of standardized technical drawings.
  - Level 2: I can describe how standardization ensures clear communication in technical drawings.
  - Level 3: I can analyze how standardized technical drawings help prevent misunderstandings across cultures and industries.
  - Level 4: I can explain how standardized technical drawings enable global collaboration in engineering projects.
  - Level 5: I can lead discussions on how standardized technical drawings facilitate seamless communication in complex, global engineering projects.
5. I can use spatial visualization techniques to interpret and create engineering drawings.
  - Level 1: I can define spatial visualization in the context of engineering.
  - Level 2: I can interpret simple 2D engineering drawings using spatial visualization techniques.
  - Level 3: I can use spatial visualization to interpret and create 3D models from engineering drawings.
  - Level 4: I can utilize advanced spatial visualization techniques to create detailed and accurate engineering drawings.
  - Level 5: I can integrate spatial visualization into collaborative design processes to ensure clear communication of ideas.
6. I can describe how CAD enhances accuracy, efficiency, and collaboration in engineering design.
  - Level 1: I can explain what CAD is and why it is used in engineering.
  - Level 2: I can describe how CAD improves the accuracy of engineering designs.
  - Level 3: I can explain how CAD enables collaboration between engineers by allowing for shared files and real-time editing.
  - Level 4: I can analyze the advantages and challenges of using CAD in engineering design.
  - Level 5: I can lead the implementation of CAD tools and practices in a collaborative engineering project.
7. I can explain the benefits of hand sketching in the engineering design process.
  - Level 1: I can describe what hand sketching is in engineering.
  - Level 2: I can explain how hand sketching can help visualize ideas quickly and communicate initial concepts.
  - Level 3: I can explain how hand sketching aids in brainstorming and iterative design.
  - Level 4: I can evaluate the role of hand sketching in the overall design process and compare it to digital methods.
  - Level 5: I can mentor others in effectively using hand sketching as part of an engineering design process.
8. I can explain the importance of standardized dimensioning in engineering.
  - Level 1: I can define what standardized dimensioning is in engineering.
  - Level 2: I can explain how standardized dimensioning ensures clarity and consistency in engineering drawings.
  - Level 3: I can describe how standardized dimensioning improves the manufacturing and construction process.
  - Level 4: I can analyze the consequences of not using standardized dimensioning in technical drawings.
  - Level 5: I can lead a team in creating engineering drawings with standardized dimensioning for complex projects.
9. I can identify and evaluate the limitations of physical and digital models in engineering.
  - Level 1: I can describe what physical and digital models are in engineering.
  - Level 2: I can explain how physical and digital models are used to represent engineering designs.
  - Level 3: I can evaluate the strengths and weaknesses of physical and digital models in different engineering contexts.
  - Level 4: I can compare and contrast the limitations of physical and digital models based on cost, accuracy, and time constraints.
  - Level 5: I can design an engineering process that integrates both physical and digital models to optimize design and prototyping.

10. I can evaluate how statistics can be used or misused in engineering analysis.  
 Level 1: I can define statistics and explain how they are used in engineering.  
 Level 2: I can describe how statistics help engineers make decisions based on data.  
 Level 3: I can evaluate the validity of statistical data used in engineering analysis.  
 Level 4: I can assess how statistical tools can be used to improve the accuracy of engineering designs.  
 Level 5: I can lead discussions on ethical considerations when using statistics in engineering.
11. I can analyze sources of measurement error and their impact on engineering design.  
 Level 1: I can identify common sources of measurement error in engineering.  
 Level 2: I can describe how measurement errors can affect engineering designs.  
 Level 3: I can analyze the impact of measurement errors on the performance and safety of an engineering product.  
 Level 4: I can evaluate the significance of different types of measurement errors in engineering analysis.  
 Level 5: I can lead a team in addressing measurement errors and their impact on complex engineering projects.
12. I can evaluate the role of models in engineering and assess their reliability.  
 Level 1: I can define what a model is in the context of engineering.  
 Level 2: I can explain the purpose of using models in engineering design.  
 Level 3: I can evaluate the reliability of a model based on its design, assumptions, and data.  
 Level 4: I can compare the reliability of different models based on engineering requirements and goals.  
 Level 5: I can lead the development and evaluation of engineering models, ensuring their reliability and effectiveness in addressing real-world problems.
13. I can compare the benefits and drawbacks of individual versus team-based problem-solving in engineering.  
 Level 1: I can explain what individual and team-based problem-solving are.  
 Level 2: I can describe when individual problem-solving is more effective and when teamwork is preferred.  
 Level 3: I can compare the effectiveness of individual versus team-based problem-solving in different engineering contexts.  
 Level 4: I can evaluate the benefits and drawbacks of individual and team-based problem-solving in complex engineering projects.  
 Level 5: I can lead a team in solving complex engineering problems, integrating individual and team-based approaches for optimal results.

Lesson Sequence	Learning Target	Success Criteria/ Assessment
<b>Lesson 1.1 Design Basics</b> In Lesson 1.1 students review and apply an engineering design process to collaboratively design a carnival game. As part of the design process, students practice the art of brainstorming and begin to develop skills in graphically representing ideas through concept sketching. Students also develop and test a solution and improve the design through iteration. In addition, students learn statistical techniques to evaluate design solutions and apply statistics to inform design decisions related to their game design.		
1	I can apply brainstorming and structured problem-solving techniques to generate multiple possible solutions to an engineering problem.	<ul style="list-style-type: none"> <li>● I can use brainstorming techniques such as mind mapping and SCAMPER to generate diverse ideas.</li> <li>● I can document and organize potential solutions using sketches and notes.</li> <li>● I can evaluate initial ideas using constraints and criteria to determine feasibility.</li> </ul>
2	I can use an iterative process to refine and improve design solutions based on data and testing.	<ul style="list-style-type: none"> <li>● I can compare multiple design iterations using criteria such as cost, performance, and sustainability.</li> <li>● I can analyze test results and adjust my design accordingly.</li> <li>● I can justify my final design choice using evidence from testing and analysis.</li> </ul>
<b>Lesson 1.2 Visualization and Solid Modeling</b> Lesson 1.2 focuses on building student spatial visualization skills. The role of modeling as a means to represent and communicate ideas, designs, and problem solutions is emphasized. Students are introduced to technical sketching and practice sketching isometric views and orthographic projections to represent three-dimensional objects. As part of the design process, students develop basic 3D solid models of simple designs and produce technical drawings using CAD. The lesson culminates in a design project in which students design and prototype a product using additive manufacturing (3D printing).		
3	I can explain the purpose and characteristics of technical drawings and how they differ from artistic drawings.	<ul style="list-style-type: none"> <li>● I can compare and contrast technical and artistic drawings based on precision, purpose, and audience.</li> <li>● I can describe how technical drawings use standardized symbols and annotations to communicate information.</li> </ul>

4	I can explain the purpose and characteristics of technical drawings and how they differ from artistic drawings.	<ul style="list-style-type: none"> <li>I can compare and contrast technical and artistic drawings based on precision, purpose, and audience.</li> <li>I can describe how technical drawings use standardized symbols and annotations to communicate information.</li> </ul>
<b>Lesson 1.3 CAD Fundamentals</b> Lesson 1.3 focuses on building CAD skills to develop 3D models and technical drawings. Students learn the importance of precision measurement and use dial calipers to make precise measurements, as they come to understand the concepts of precision and accuracy and their implication on engineering design and manufacturing. Students apply statistics to quantify the precision and accuracy of measurements and of measuring tools. Multiple CAD topics are introduced, and students apply the engineering design process and their new CAD skills to design and 3D print a protective case for a product.		
5	I can analyze how standardized technical drawings enable clear communication across different cultures and industries.	<ul style="list-style-type: none"> <li>I can explain how international drafting standards improve global collaboration.</li> <li>I can identify challenges that arise when technical drawings lack clarity or do not follow standards.</li> </ul>
6	I can use spatial visualization techniques to interpret and create engineering drawings.	<ul style="list-style-type: none"> <li>I can mentally rotate and visualize 3D objects from 2D drawings.</li> <li>I can sketch different views (orthographic, isometric) of an object accurately.</li> </ul>
7	I can describe how CAD enhances accuracy, efficiency, and collaboration in engineering design.	<ul style="list-style-type: none"> <li>I can identify key advantages of CAD, such as precision, editing capabilities, and 3D visualization.</li> <li>I can create basic 3D models in CAD and compare them to hand-drawn sketches.</li> </ul>
8	I can explain the benefits of hand sketching in the engineering design process.	<ul style="list-style-type: none"> <li>I can describe how hand sketching is useful for quick idea generation and early-stage design thinking.</li> <li>I can create clear technical sketches before transitioning to CAD.</li> </ul>
9	I can explain the importance of standardized dimensioning in engineering.	<ul style="list-style-type: none"> <li>I can apply standard dimensioning rules to technical drawings.</li> <li>I can analyze incorrect dimensioning and explain the potential consequences in manufacturing.</li> </ul>
10	I can identify and evaluate the limitations of physical and digital models in engineering.	<ul style="list-style-type: none"> <li>I can explain how models may not fully represent real-world conditions (e.g., material properties, scale limitations).</li> <li>I can justify when to use a model versus real-world testing.</li> </ul>
11	I can evaluate how statistics can be used or misused in engineering analysis.	<ul style="list-style-type: none"> <li>I can analyze how data can be manipulated to support different conclusions.</li> <li>I can use statistical methods to fairly interpret and validate design performance.</li> </ul>
<b>Lesson 1.4 Product Improvement</b> Students work within teams to apply the design process and the skills and knowledge gained in this unit to evaluate and improve the design of a consumer product to meet stakeholder needs. Students will learn effective presentation techniques and present their solutions to an audience.		
12	I can analyze sources of measurement error and their impact on engineering design.	<ul style="list-style-type: none"> <li>I can explain the difference between systematic and random errors.</li> <li>I can use appropriate precision and significant figures in engineering measurements.</li> </ul>
13	I can evaluate the role of models in engineering and assess their reliability.	<ul style="list-style-type: none"> <li>I can explain why engineers use models to test ideas before full-scale production.</li> <li>I can identify factors that influence the accuracy of a model.</li> </ul>
14	I can compare the benefits and drawbacks of individual versus team-based problem-solving in engineering.	<ul style="list-style-type: none"> <li>I can explain when individual work might be more efficient in engineering.</li> <li>I can describe how team collaboration improves complex problem-solving.</li> </ul>

<b>Unit Title:</b>	
Unit 2: Assembly Design	
<b>Unit Description:</b>	
Unit 2 emphasizes the design of systems of components. Students are introduced to the concept of reverse engineering and how to investigate and document the design of multi-component systems. Students learn various techniques used to connect components in a system, how systems are designed to allow desired interaction between components, and how to identify and select the materials from which products are made. They are also introduced to methods to improve the manufacturability of a product and reduce production costs. Students learn to apply two methods to create 3D assembly models in CAD and apply those techniques to design and document assemblies.	
<b>Relevant Standards: Bold indicates priority</b>	
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards <b>Standards for Technological and Engineering Literacy</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ol style="list-style-type: none"> <li>1. Is it necessary to indicate a tolerance for every dimension on a technical drawing?</li> <li>2. What are the benefits of working drawings when communicating the design of a consumer product?</li> <li>3. Beyond creating working drawings to document a design, how can CAD be used in and beyond the design process?</li> <li>4. Why is reverse engineering done?</li> <li>5. How is information gathered through product disassembly?</li> <li>6. When is it acceptable for a company to reverse engineer and reproduce a successful consumer product designed by another person/company?</li> <li>7. Why are many consumer product designs not commercially successful?</li> <li>8. How do you determine the properties of a material?</li> <li>9. How does the material chosen for a product impact the design of the product?</li> <li>10. How does an engineer predict the safety and reliability of a selected material?</li> <li>11. What strategy would you use to form a design team in order to obtain the best solution possible?</li> <li>12. Why is a design process so important to follow when creating a solution to a problem?</li> </ol>	<ol style="list-style-type: none"> <li>1. Students will understand when tolerances are necessary in technical drawings and how they impact fit and function.</li> <li>2. Students will recognize the benefits of working drawings in effectively communicating design intent and manufacturing details.</li> <li>3. Students will explore how CAD extends beyond technical drawings to include simulations, prototyping, and other engineering applications.</li> <li>4. Students will analyze the purpose of reverse engineering in improving products, solving problems, and driving innovation.</li> <li>5. Students will investigate how product disassembly provides insights into materials, manufacturing processes, and design decisions.</li> <li>6. Students will evaluate when it is ethically and legally acceptable for companies to reverse engineer and reproduce a product.</li> <li>7. Students will examine the reasons why many consumer product designs fail in the market.</li> <li>8. Students will learn how to determine the properties of materials through testing and analysis.</li> <li>9. Students will assess how material selection influences the design, functionality, and manufacturability of a product.</li> <li>10. Students will explore how engineers predict material safety and reliability using data, simulations, and real-world testing.</li> <li>11. Students will develop strategies for forming effective design teams to create innovative solutions.</li> <li>12. Students will understand the importance of following a structured design process to develop successful solutions to engineering challenges.</li> </ol>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>

<p>Students demonstrate learning by designing and creating a 3D CAD model of a functional assembly, utilizing proper engineering practices to join parts together, specifying tolerances, and documenting their design through assembly drawings; effectively showcasing their understanding of mechanical fasteners, fits, and the assembly process while applying these concepts to reverse engineer and improve a consumer product.</p>	<p>40 Full Class Periods</p>																					
<p><b>Family Overview (link below)</b></p>	<p><b>Integration of Technology:</b></p>																					
<p><a href="#">Family Overview - PLTW Intro to Engineering Design</a>  <a href="#">Family Overview - PLTW Intro to Engineering Design (Spanish)</a></p>	<p>MasterCam CAD Software</p>																					
<p><b>Unit-specific Vocabulary:</b></p>	<p><b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b></p>																					
<table border="1"> <tr> <td>Orthographic projection</td> <td>Dimensioning</td> <td>Edge</td> </tr> <tr> <td>Multiview drawing</td> <td>Leader line</td> <td>Ellipse</td> </tr> <tr> <td>Front view</td> <td>Dimension line</td> <td>Isometric sketch</td> </tr> <tr> <td>Top view</td> <td>Tolerance</td> <td>Oblique sketch</td> </tr> <tr> <td>Right side view</td> <td>Scale</td> <td>Auxiliary view</td> </tr> <tr> <td></td> <td>Hidden line</td> <td>Section view</td> </tr> <tr> <td></td> <td>Center line</td> <td>Detail view</td> </tr> </table>	Orthographic projection	Dimensioning	Edge	Multiview drawing	Leader line	Ellipse	Front view	Dimension line	Isometric sketch	Top view	Tolerance	Oblique sketch	Right side view	Scale	Auxiliary view		Hidden line	Section view		Center line	Detail view	<p>N/A</p>
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<p><b>Opportunities for Interdisciplinary Connections:</b></p>	<p><b>Anticipated misconceptions:</b></p>																					
<ul style="list-style-type: none"> <li>• Geometry &amp; Measurement: Apply geometric principles when creating technical drawings and calculating tolerances.</li> <li>• Statistics &amp; Probability: Analyze product failure rates and material testing data to predict reliability.</li> <li>• Algebra &amp; Calculus: Use equations to model forces, stress, and material properties in design.</li> <li>• Forces &amp; Motion: Analyze how forces impact product durability and safety.</li> <li>• Energy &amp; Thermodynamics: Investigate how heat affects materials and product performance.</li> <li>• Marketing &amp; Consumer Behavior: Study why some products fail and how market demand shapes design.</li> <li>• Intellectual Property &amp; Ethics: Discuss patents, copyrights, and ethical considerations in reverse engineering.</li> <li>• Cost Analysis: Evaluate how material selection and manufacturing affect product pricing.</li> <li>• Coding &amp; Automation: Explore programming in manufacturing and product testing.</li> <li>• Aesthetic Design: Examine how color, shape, and texture impact consumer product appeal.</li> <li>• User Experience (UX) &amp; Human-Centered Design: Explore how psychology and ergonomics influence product design.</li> <li>• Graphic Design: Create visually clear and effective technical drawings.</li> <li>• Global Trade &amp; Manufacturing: Investigate how supply chains and material sourcing affect product design.</li> </ul>	<ul style="list-style-type: none"> <li>• Tolerances are needed for every dimension on a technical drawing.</li> <li>• CAD is just for making drawings.</li> <li>• Reverse engineering is simply copying other products</li> <li>• The best material for a product is always the strongest one.</li> <li>• Once the design process is complete, it doesn't need to be revisited.</li> </ul>																					

<ul style="list-style-type: none"> <li>Ethics &amp; Sustainability: Examine environmental impacts of material choices and manufacturing methods.</li> </ul>	
<b>Connections to Prior Units:</b>	<b>Connections to Future Units:</b>
<b>Unit 1: Design and Problem Solving</b> <ul style="list-style-type: none"> <li>Unit 1 introduces foundational design thinking and problem-solving skills that are crucial for Unit 2 (Assembly Design). Students will apply these skills to understand how individual components fit together to create a functional assembly.</li> </ul>	<b>Unit 3: Thoughtful Product Design</b> <ul style="list-style-type: none"> <li>Unit 2 focuses on assembling parts efficiently. These skills will be essential in Unit 3 where students will design products with attention to aesthetics, usability, and material selection, ensuring the parts come together in a user-friendly way.</li> </ul> <b>Unit 4: Making Things Move</b> <ul style="list-style-type: none"> <li>The understanding of how components fit together in <b>Unit 2</b> is crucial for designing systems with mechanical movement. This supports students in Unit 4 where they will learn to incorporate moving parts into assemblies.</li> </ul>
<b>Differentiation through <i>Universal Design for Learning</i></b>	
<b>UDL Indicator</b>	<b>Teacher Actions:</b>
<p>1. Representation</p> <ul style="list-style-type: none"> <li>Visual Aids: Use flowcharts and diagrams to illustrate the components of multi-component systems and the reverse engineering process. This can help students understand system interactions visually.</li> <li>Video Tutorials: Provide access to video demonstrations of reverse engineering techniques and CAD assembly modeling. This allows students to learn at their own pace and revisit complex concepts as needed.</li> <li>Interactive Models: Utilize 3D models that students can manipulate digitally to understand how components fit together and interact. This hands-on experience can reinforce learning.</li> <li>Annotated Examples: Present annotated examples of successful assembly designs, highlighting how different components work together and the considerations for material selection.</li> </ul> <p>2. Engagement</p> <ul style="list-style-type: none"> <li>Choice in Investigation: Allow students to choose which product to reverse engineer based on their interests, promoting ownership of their learning process.</li> <li>Group Collaboration: Facilitate collaborative group work where students can share insights and strategies while reverse engineering and documenting their findings. This encourages teamwork and diverse perspectives.</li> <li>Guest Speakers: Invite industry professionals to speak about real-world applications of assembly design and reverse engineering, providing students with insights into the relevance of their work.</li> </ul> <p>3. Action and Expression</p> <ul style="list-style-type: none"> <li>Flexible Presentation Options: Allow students to present their reverse engineering findings and assembly designs in various formats, such as reports, presentations, or digital portfolios.</li> <li>Documentation Templates: Provide structured templates for students to document their reverse engineering process, including component analysis, material selection, and design improvements, ensuring clarity and organization.</li> <li>Hands-On Prototyping: Encourage students to build physical prototypes of their assembly designs using accessible materials. This tactile experience reinforces their understanding of assembly techniques and manufacturability.</li> <li>Feedback Mechanisms: Implement peer review sessions where students can share their documentation and assembly designs with classmates to receive feedback and suggestions for refinement.</li> </ul>	
<b>Related <i>CELP standards:</i></b>	<b>Learning Targets:</b>
<p>1. Students will understand the importance of tolerances in technical drawings and how they impact the manufacturing process.</p> <p>Level 1: I can define what tolerances are in technical drawings.</p> <p>Level 2: I can explain how tolerances affect the precision and fit of manufactured parts.</p> <p>Level 3: I can analyze the impact of tolerances on the manufacturing process and product performance.</p> <p>Level 4: I can assess the trade-offs between tighter and looser tolerances in terms of cost and performance.</p> <p>Level 5: I can design technical drawings with appropriate tolerances to meet engineering and manufacturing requirements.</p>	

2. Students will be able to explain the importance of working drawings in the design communication process.
  - Level 1: I can define what a working drawing is in engineering design.
  - Level 2: I can explain how working drawings communicate design details to manufacturers.
  - Level 3: I can describe the role of working drawings in ensuring the accuracy of construction or manufacturing.
  - Level 4: I can evaluate how working drawings facilitate clear communication among engineering teams, clients, and manufacturers.
  - Level 5: I can create detailed working drawings that effectively communicate the design intent and specifications.
3. Students will understand the expanded role of CAD in both the design and manufacturing processes.
  - Level 1: I can explain what CAD is and its basic uses in engineering.
  - Level 2: I can describe how CAD is used to create and modify designs in the engineering process.
  - Level 3: I can explain how CAD supports the manufacturing process through simulations and prototyping.
  - Level 4: I can assess the advantages of using CAD for both design and manufacturing processes, including cost and time savings.
  - Level 5: I can lead a design project that integrates CAD for both design development and the manufacturing process.
4. Students will understand the reasons behind reverse engineering and how it is applied in product development.
  - Level 1: I can define reverse engineering in the context of product development.
  - Level 2: I can explain why reverse engineering is used to understand existing products and improve designs.
  - Level 3: I can describe how reverse engineering is applied to analyze and recreate a product's components.
  - Level 4: I can assess how reverse engineering contributes to innovation and competitive advantage in product development.
  - Level 5: I can lead a reverse engineering project to analyze an existing product and use the insights to develop new design solutions.
5. Students will be able to describe the process of gathering data and insights through product disassembly.
  - Level 1: I can explain what product disassembly is and why it is important.
  - Level 2: I can describe the basic steps involved in disassembling a product for analysis.
  - Level 3: I can explain how data collected through disassembly is used to understand product design and function.
  - Level 4: I can analyze the information obtained from product disassembly to identify design improvements.
  - Level 5: I can manage a product disassembly process to gather detailed insights for product redesign and development.
6. Students will understand the ethical and legal boundaries of reverse engineering in the context of intellectual property.
  - Level 1: I can define intellectual property and reverse engineering.
  - Level 2: I can explain the basic legal and ethical considerations involved in reverse engineering.
  - Level 3: I can analyze situations where reverse engineering may violate intellectual property rights.
  - Level 4: I can evaluate the ethical implications of reverse engineering in the context of innovation and competition.
  - Level 5: I can lead discussions on how to navigate the legal and ethical boundaries of reverse engineering while respecting intellectual property rights.
7. Students will understand the factors that contribute to the commercial success or failure of consumer products.
  - Level 1: I can identify factors that influence the commercial success of a product, such as design and cost.
  - Level 2: I can explain how consumer needs, marketing, and design affect a product's success.
  - Level 3: I can analyze how the price, functionality, and usability of a product impact its commercial success.
  - Level 4: I can assess the role of competition, market trends, and customer feedback in the success or failure of consumer products.
  - Level 5: I can evaluate and design strategies to enhance the commercial success of consumer products in the marketplace.
8. Students will understand how to assess and select materials based on their properties for engineering applications.
  - Level 1: I can identify different types of materials used in engineering, such as metals and plastics.
  - Level 2: I can describe how the properties of materials, like strength and durability, influence their use in engineering.
  - Level 3: I can explain how to select materials based on their specific properties for a given engineering application.
  - Level 4: I can analyze the trade-offs between material properties to select the most appropriate material for a design.
  - Level 5: I can lead a process for selecting materials for a complex engineering project based on performance, cost, and environmental impact.
9. Students will understand the impact of material selection on the product's design, functionality, and manufacturing process.
  - Level 1: I can define how material selection affects a product's design and function.
  - Level 2: I can describe how the choice of material impacts manufacturing processes, such as cost and ease of production.
  - Level 3: I can explain how different materials can affect the performance and longevity of a product.
  - Level 4: I can analyze how material properties must be considered in both the design and manufacturing stages of a product.
  - Level 5: I can assess and optimize material selection in a design to balance cost, functionality, and manufacturability.
10. Students will understand the methods engineers use to predict and assess the safety and reliability of materials.
  - Level 1: I can identify common methods used to test the safety and reliability of materials.
  - Level 2: I can explain how engineers use testing to evaluate material strength, durability, and performance.
  - Level 3: I can describe how engineers use data and modeling to predict material failure under various conditions.
  - Level 4: I can assess the safety and reliability of materials based on testing and real-world applications.

Level 5: I can lead the development of testing protocols to predict and ensure the safety and reliability of materials in complex engineering designs.

11. Students will learn how to form effective design teams that can collaborate to find the best solutions.

Level 1: I can explain the basic concepts of team collaboration in engineering design.

Level 2: I can describe how different team roles contribute to effective design problem-solving.

Level 3: I can demonstrate how effective communication and teamwork lead to better design solutions.

Level 4: I can analyze how team dynamics influence the success of a design project and suggest improvements.

Level 5: I can lead and manage a multidisciplinary design team to collaborate on solving complex engineering challenges.

12. Students will understand the importance of following a structured design process to create effective solutions.

Level 1: I can define what a structured design process is in engineering.

Level 2: I can describe the steps involved in a structured design process, such as ideation and prototyping.

Level 3: I can explain how following a structured design process helps create effective and functional solutions.

Level 4: I can analyze how each step of the design process contributes to the final product's success.

Level 5: I can lead a design project, ensuring all steps of the structured design process are followed to develop a successful engineering solution.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
<p><b>Lesson 2.1 Put it Together</b></p> <p>Students continue to build skills in CAD. Methods to physically join parts into an assembly (including mechanical fasteners and adhesives as well as press fits and hinges) are presented. Interference and clearance fits are introduced, and students learn to apply tolerances to achieve desired fits between interacting parts. CAD assembly modeling is introduced, and students learn to create simple bottom-up assemblies that realistically simulate physical assemblies. Assemblies are documented in CAD with assembly drawings. Students are challenged to iterate on an earlier design project to incorporate skills and knowledge that they have learned in this lesson.</p>			
1	Students will understand the importance of tolerances in technical drawings and how they impact the manufacturing process.	<ul style="list-style-type: none"> <li>• Students can explain why tolerances are necessary for ensuring parts fit together and function as intended.</li> <li>• Students can describe the potential consequences of not indicating tolerances on a technical drawing.</li> <li>• Students can provide examples of how different tolerances are applied to different types of dimensions on technical drawings.</li> </ul>	
2	Students will be able to explain the importance of working drawings in the design communication process.	<ul style="list-style-type: none"> <li>• Students can identify key components of a working drawing and how they communicate detailed information.</li> <li>• Students can explain how working drawings improve collaboration between engineers, manufacturers, and clients.</li> <li>• Students can discuss how accurate and clear working drawings can prevent errors and ensure product quality.</li> </ul>	
3	Students will understand the expanded role of CAD in both the design and manufacturing processes.	<ul style="list-style-type: none"> <li>• Students can explain how CAD is used to create detailed models and simulations during the design process.</li> <li>• Students can identify how CAD tools can be used for testing, prototyping, and even generating manufacturing instructions.</li> <li>• Students can describe how CAD can be used for visualization, collaboration, and documentation beyond the initial design phase.</li> </ul>	

### Lesson 2.2 Take it Apart

Lesson 2.2 exposes students to the application of engineering principles and practices to reverse engineer a consumer product. Reverse engineering involves disassembling and analyzing a product or system in order to understand and document the visual, functional, and/or structural aspects of its design. In this lesson, students assess all three aspects of a product's design. Students are introduced to a second method of CAD assembly modeling, top-down modeling and use it to model the consumer product they have reverse-engineered.

Students will also conduct a case study of a common consumer product to identify ways to improve the manufacturability and ease of assembly of the product. Then they apply the design process again to design and prototype (3D print) an integrated accessory for the reversed engineered product and present the design.

4	Students will understand the reasons behind reverse engineering and how it is applied in product development.	<ul style="list-style-type: none"> <li>• Students can explain the primary reasons for reverse engineering, including understanding a competitor's product or improving an existing design.</li> <li>• Students can provide examples of industries or situations where reverse engineering is commonly used.</li> <li>• Students can discuss the ethical considerations associated with reverse engineering.</li> </ul>
5	Students will be able to describe the process of gathering data and insights through product disassembly.	<ul style="list-style-type: none"> <li>• Students can outline the steps involved in disassembling a product to learn about its components and design.</li> <li>• Students can identify specific types of information that can be obtained through disassembly (e.g., materials used, manufacturing techniques).</li> <li>• Students can explain how product disassembly aids in improving or replicating design features.</li> </ul>
6	Students will understand the ethical and legal boundaries of reverse engineering in the context of intellectual property.	<ul style="list-style-type: none"> <li>• Students can describe when reverse engineering is acceptable (e.g., for research, repair, or education).</li> <li>• Students can explain when it is illegal or unethical to reverse engineer a product (e.g., patent infringement or violation of copyrights).</li> <li>• Students can give examples of cases where reverse engineering has led to legal disputes.</li> </ul>
7	Students will understand the factors that contribute to the commercial success or failure of consumer products.	<ul style="list-style-type: none"> <li>• Students can identify common reasons why consumer products fail, such as poor market research, design flaws, or pricing issues.</li> <li>• Students can analyze the importance of understanding customer needs and market trends in designing successful products.</li> <li>• Students can discuss how failure to innovate or adapt to new technology impacts a product's commercial success.</li> </ul>

### Lesson 2.3 A Material World

Students investigate a variety of materials through experimentation to identify properties that determine material selection. The types of materials investigated include wood, metals, ceramics, plastics, and composites. Properties investigated may include density, conductivity, strength, flexibility, hardness, and so on. Students are then tasked with selecting materials to serve specific purposes. They learn how to assign specific materials to CAD model components and to differentiate between assigning the physical properties of a material to a part and only changing the visual appearance of the part. Finally, students work on a team to imagine the future through research of innovative materials and brainstorm a new consumer product composed of one or more advanced material.

8	Students will understand how to assess and select materials based on their properties for engineering applications.	<ul style="list-style-type: none"> <li>• Students can describe the key properties of materials (e.g., strength, flexibility, thermal conductivity, corrosion resistance).</li> <li>• Students can explain different methods for determining material properties, including testing and research.</li> <li>• Students can select a material based on its suitability for a given engineering project or design.</li> </ul>
9	Students will understand the impact of material selection on the product's design, functionality, and manufacturing process.	<ul style="list-style-type: none"> <li>• Students can explain how material properties affect a product's strength, weight, and durability.</li> <li>• Students can discuss how material selection influences manufacturing processes such as casting, molding, or machining.</li> <li>• Students can provide examples of how the wrong material choice can lead to design flaws or product failure.</li> </ul>
10	Students will understand the methods engineers use to predict and assess the safety and reliability of materials.	<ul style="list-style-type: none"> <li>• Students can describe methods used to test material strength and reliability, such as stress tests or fatigue testing.</li> <li>• Students can explain how engineers use data to predict how a material will behave under different conditions.</li> </ul>

		<ul style="list-style-type: none"> <li>Students can identify the importance of safety standards and regulations in selecting reliable materials for products.</li> </ul>
<b>Lesson 3.3 Solve a Problem</b> In teams, students act as an engineering consultant group to solve a problem from a list of problems gathered from school and/or community stakeholders. As part of the design process, the team applies the engineering design process to develop a sustainable solution that includes consideration of material choices and the life cycle of the design solution. As part of the design process students meet with the client to understand user needs, develop effective design criteria to inform the design and create a project design brief. Students also practice important project management skills including developing a task and delivery schedule to manage and monitor project work and periodically reporting out on project process.		
11	Students will learn how to form effective design teams that can collaborate to find the best solutions.	<ul style="list-style-type: none"> <li>Students can describe the roles and responsibilities of different team members in a design team.</li> <li>Students can explain how to identify the strengths and weaknesses of team members to create a balanced team.</li> <li>Students can discuss how communication, collaboration, and conflict resolution contribute to the success of a design team.</li> </ul>
12	Students will understand the importance of following a structured design process to create effective solutions.	<ul style="list-style-type: none"> <li>Students can explain the steps of a standard design process (e.g., define the problem, brainstorm solutions, prototype, test).</li> <li>Students can describe how following the design process helps ensure thorough problem-solving and efficient use of resources.</li> <li>Students can provide examples of how skipping steps in the design process can lead to poor design outcomes.</li> </ul>

<b>Unit Title:</b>	
Unit 3: Thoughtful Product Design	
<b>Unit Description:</b>	
Unit 3 introduces students to a broader interpretation of the word design to include universal principles that contribute to successful product design. Students are exposed to design principles (other than the visual design principles presented in Unit 2) that can impact the appeal, usability, safety, and sustainability of a product. Design topics that are introduced or reinforced include product life-cycle, sustainability, manufacturability, human centered design, and systems thinking.	
<b>Relevant Standards: Bold indicates priority</b>	
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards	
<b>Standards for Technological and Engineering Literacy</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ol style="list-style-type: none"> <li>1. What does it mean to be ethical in your work?</li> <li>2. How do ethics impact the manufacturing of products?</li> <li>3. How do design criteria and constraints limit material choices for a design?</li> <li>4. What are the benefits of human-centered design?</li> <li>5. Why is it important to have clear, accurate, and detailed communication among all involved in the design, manufacturing, and distribution process?</li> <li>6. Why is it important to study a product's life cycle?</li> <li>7. What are team norms and why do they matter?</li> <li>8. What questions should you ask yourself before beginning a project?</li> </ol>	<ol style="list-style-type: none"> <li>1. Students will understand that being ethical means making choices that are fair, honest, and responsible in their work and in their impact on others.</li> <li>2. Students will recognize that ethics affect the manufacturing process by influencing decisions about sustainability, labor practices, safety, and the environmental impact of products.</li> <li>3. Students will understand that design criteria and constraints, like cost, function, and user needs, limit the types of materials that can be used in a product.</li> <li>4. Students will recognize that human-centered design focuses on creating products that meet the needs and preferences of the people who will use them.</li> <li>5. Students will understand that clear, accurate, and detailed communication ensures that everyone involved in the design, manufacturing, and distribution process is on the same page, preventing mistakes and delays.</li> <li>6. Students will recognize that studying a product's life cycle helps identify its environmental impact and guides decisions on how to make more sustainable choices.</li> <li>7. Students will understand that team norms are rules or guidelines that help teams work well together, promoting respect, responsibility, and effective collaboration.</li> <li>8. Students will ask important questions, like "What problem am I solving?" and "What resources do I need?" to ensure that they are ready and focused before starting a project.</li> </ol>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>

<p>Students demonstrate learning by applying design principles and systems thinking to solve a real-world problem, showcasing their understanding through detailed sketches, comprehensive design documentation, a well-developed prototype, and a presentation that clearly communicates their design process, rationale, and justification for design decisions, while incorporating feedback from user testing and considering sustainability factors throughout the project.</p>	<p>40 Full Class Periods</p>			
<p><b>Family Overview (link below)</b></p>	<p><b>Integration of Technology:</b></p>			
<p><a href="#">Family Overview - PLTW Intro to Engineering Design</a>  <a href="#">Family Overview - PLTW Intro to Engineering Design (Spanish)</a></p>	<p>MasterCam CAD Software</p>			
<p><b>Unit-specific Vocabulary:</b></p>	<p><b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b></p>			
<table border="1"> <tr> <td> <p>Measurement units (inches, centimeters, millimeters) Precision Accuracy Mean Median</p> </td> <td> <p>Mode Standard deviation Data analysis Scatter plot Correlation</p> </td> <td> <p>Statistical inference Sample size Margin of error Tolerance Dimensioning Design constraints</p> </td> </tr> </table>	<p>Measurement units (inches, centimeters, millimeters) Precision Accuracy Mean Median</p>	<p>Mode Standard deviation Data analysis Scatter plot Correlation</p>	<p>Statistical inference Sample size Margin of error Tolerance Dimensioning Design constraints</p>	<p>N/A</p>
<p>Measurement units (inches, centimeters, millimeters) Precision Accuracy Mean Median</p>	<p>Mode Standard deviation Data analysis Scatter plot Correlation</p>	<p>Statistical inference Sample size Margin of error Tolerance Dimensioning Design constraints</p>		
<p><b>Opportunities for Interdisciplinary Connections:</b></p>	<p><b>Anticipated misconceptions:</b></p>			
<ul style="list-style-type: none"> <li>Ethical Design and Social Studies: Connect ethical design principles to discussions about social responsibility, fairness, and human rights in social studies, exploring how engineering impacts society and aligns with ethical considerations in global contexts.</li> <li>Communication and English/Language Arts: Integrate clear, detailed communication with writing and speaking skills, emphasizing the importance of conveying complex technical information effectively in reports, presentations, and discussions.</li> <li>Life Cycle Analysis and Environmental Science: Link the study of a product's life cycle to environmental science concepts like sustainability, resource conservation, and ecological impact, emphasizing the importance of considering long-term environmental effects during the design process.</li> <li>Design Constraints and Mathematics/Physics: Connect design constraints to mathematical problem-solving and physics principles, helping students understand how measurements, calculations, and material properties influence design decisions related to forces, weight, and cost.</li> </ul>	<ul style="list-style-type: none"> <li>Ethical design only concerns personal integrity and doesn't need to account for the environmental or societal impacts of a product.</li> <li>Communication among team members doesn't need to be very detailed as long as everyone knows their individual tasks.</li> <li>The life cycle of a product only involves its time in use and disposal, ignoring the environmental and social effects during manufacturing.</li> <li>Design constraints are just restrictions that limit creativity, so they should be avoided whenever possible to allow for more freedom in design.</li> <li>Human-centered design only focuses on making products look good or user-friendly, but doesn't need to consider the practicality or functionality of the design.</li> </ul>			
<p><b>Connections to Prior Units:</b></p>	<p><b>Connections to Future Units:</b></p>			
<p><b>Unit 1: Design and Problem Solving</b></p> <ul style="list-style-type: none"> <li>Unit 3 builds on the problem-solving and creative thinking skills learned in Unit 1 by guiding students to apply those skills in developing thoughtful and functional product designs. It</li> </ul>	<p><b>Unit 4: Making Things Move</b></p> <ul style="list-style-type: none"> <li>Unit 3 lays the groundwork for Unit 4 by encouraging students to think about how their designs can incorporate movement and mechanical functionality. It introduces concepts</li> </ul>			

<p>encourages students to consider not only the technical aspects but also user needs and ethical implications, expanding on the foundation of problem-solving.</p> <p><b>Unit 2: Assembly Design</b></p> <ul style="list-style-type: none"> <li>Unit 3 connects to Unit 2 by focusing on the integration of individual parts into a well-thought-out product design. While Unit 2 emphasized how components fit together, Unit 3 teaches students to consider factors like usability, sustainability, and overall design coherence, making the assembly process more intentional.</li> </ul>	<p>related to forces, materials, and energy, which will be crucial when students begin to explore how to create moving components in Unit 4.</p>
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**Differentiation through *Universal Design for Learning***

UDL Indicator	Teacher Actions:
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<p>1. Representation</p> <ul style="list-style-type: none"> <li>Case Studies: Provide case studies of successful products that exemplify universal design principles. Analyze these examples in class to highlight how different factors influence product success.</li> <li>Interactive Simulations: Use simulations to demonstrate the product life cycle and the impact of design choices on sustainability and manufacturability. This allows students to see the consequences of their decisions in a virtual environment.</li> <li>Resource Libraries: Compile a collection of articles, videos, and other resources that explore various aspects of thoughtful product design. This allows students to explore topics that interest them at their own pace.</li> </ul> <p>2. Engagement</p> <ul style="list-style-type: none"> <li>Design Challenges: Present students with real-world problems that require thoughtful product design solutions. Encourage them to apply design principles to develop innovative ideas, fostering creativity and critical thinking.</li> <li>Cross-Disciplinary Connections: Integrate lessons with other subjects, such as environmental science or ethics, to show the relevance of design principles across disciplines and increase student interest.</li> <li>Peer Collaboration: Encourage collaborative projects where students can work in teams to design a product that meets specific criteria related to usability and sustainability. This promotes teamwork and diverse perspectives.</li> <li>Community Involvement: Involve local stakeholders or community members to provide input on design projects, allowing students to understand the impact of their designs on real users.</li> </ul> <p>3. Action and Expression</p> <ul style="list-style-type: none"> <li>Diverse Project Formats: Allow students to express their understanding of design principles through various formats, such as presentations, prototypes, reports, or digital media projects. This enables them to showcase their strengths.</li> <li>Reflective Journals: Encourage students to maintain a reflective journal throughout the unit, documenting their design process, challenges faced, and lessons learned related to product design principles. This promotes metacognition and self-assessment.</li> <li>User Testing: Incorporate user testing into the design process, allowing students to gather feedback on their prototypes or concepts from peers or community members. This helps them refine their designs based on real user experiences.</li> </ul>
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**Supporting Multilingual/English Learners**

Related <i>CELP standards:</i>	Learning Targets:
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<p>1. Students will understand what it means to be ethical in their work and how ethics guide decision-making in engineering.</p> <p>Level 1: I can define ethics and explain why they are important in engineering.</p> <p>Level 2: I can describe how ethical considerations influence decision-making in engineering projects.</p> <p>Level 3: I can analyze how ethical issues can affect the outcomes of engineering designs and decisions.</p> <p>Level 4: I can evaluate the impact of ethical decision-making on the long-term success of engineering projects.</p> <p>Level 5: I can lead discussions on how engineers can navigate ethical challenges and make responsible decisions in complex projects.</p> <p>2. Students will understand how ethics impact the manufacturing of products.</p> <p>Level 1: I can explain what ethical issues may arise in manufacturing.</p> <p>Level 2: I can describe how unethical practices in manufacturing can affect product quality and safety.</p>
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- Level 3: I can explain how ethical considerations, such as labor practices and environmental impact, influence manufacturing decisions.
- Level 4: I can evaluate how companies can implement ethical practices in the manufacturing process to improve outcomes.
- Level 5: I can lead initiatives that ensure ethical practices are integrated into the manufacturing process across projects.
3. Students will understand how design criteria and constraints limit material choices for a design.
- Level 1: I can define design criteria and constraints in engineering.
- Level 2: I can describe how design criteria, such as strength and cost, impact material selection.
- Level 3: I can explain how constraints, like weight and environmental impact, limit material choices in a design.
- Level 4: I can analyze how different design constraints interact and affect material selection in complex projects.
- Level 5: I can make material recommendations based on specific design criteria and constraints to meet project goals.
4. Students will understand the benefits of human-centered design.
- Level 1: I can explain what human-centered design is.
- Level 2: I can describe how human-centered design focuses on user needs and experiences.
- Level 3: I can analyze the benefits of human-centered design in creating products that are functional and user-friendly.
- Level 4: I can evaluate how human-centered design improves product satisfaction and user engagement.
- Level 5: I can apply human-centered design principles to lead the creation of innovative, user-focused engineering solutions.
5. Students will understand the importance of clear, accurate, and detailed communication among all involved in the design, manufacturing, and distribution process.
- Level 1: I can explain why clear communication is important in the engineering process.
- Level 2: I can describe how accurate and detailed communication helps reduce errors in design and manufacturing.
- Level 3: I can explain how effective communication among teams improves the overall efficiency of a project.
- Level 4: I can analyze the consequences of poor communication on the design, manufacturing, and distribution of a product.
- Level 5: I can implement strategies to enhance communication across all stages of design, manufacturing, and distribution.
6. Students will understand why it is important to study a product's life cycle.
- Level 1: I can define what a product life cycle is.
- Level 2: I can explain the stages of a product's life cycle, from design to disposal.
- Level 3: I can describe how studying the product life cycle helps engineers identify environmental and economic impacts.
- Level 4: I can analyze how different stages of the product life cycle influence the sustainability and cost-effectiveness of a product.
- Level 5: I can lead a life cycle analysis for a product to identify areas for improvement in sustainability and efficiency.
7. Students will understand the concept of team norms and why they matter.
- Level 1: I can define what team norms are.
- Level 2: I can describe how team norms help improve collaboration and productivity.
- Level 3: I can explain the role of team norms in creating a respectful and efficient working environment.
- Level 4: I can evaluate how well-established team norms contribute to successful team performance and conflict resolution.
- Level 5: I can facilitate the development and enforcement of team norms to foster a collaborative, effective team environment.
8. Students will understand the key questions to ask themselves before beginning a project.
- Level 1: I can identify basic questions to ask before starting a project.
- Level 2: I can describe why it's important to ask questions like "What is the goal of the project?"
- Level 3: I can explain how asking the right questions at the beginning of a project helps clarify objectives and scope.
- Level 4: I can analyze the impact of asking key questions on project success and avoiding potential pitfalls.
- Level 5: I can lead a team in formulating and addressing critical questions before starting complex engineering projects.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
<p>Lesson 3.1 Responsible Design</p> <p>Lesson 3.1 begins with students reverse engineering a multi-material consumer product, then identifying and researching the component materials and the material properties that likely contribute to their selection for use in the product. Students are introduced to life cycle analysis and the principles of sustainable development then compare the life cycle of common competing products. The importance of identifying measurable design criteria to define a successful solution and that can be used to evaluate a potential solution is emphasized in this lesson.</p>			
1	I can understand what it means to be ethical in their work and how ethics guide decision-making in engineering.	<ul style="list-style-type: none"> <li>I can explain the concept of ethics and its application to the engineering profession.</li> <li>I can identify examples of ethical and unethical behavior in product design and manufacturing.</li> <li>I can discuss how ethical considerations impact their decisions and actions in an engineering context.</li> </ul>	
2	I can understand how ethics impact the manufacturing of products.	<ul style="list-style-type: none"> <li>I can explain how ethical issues, such as labor practices, environmental impact, and product safety, influence manufacturing decisions.</li> </ul>	

		<ul style="list-style-type: none"> <li>I can describe the consequences of unethical practices in manufacturing.</li> <li>I can identify strategies for ensuring ethical manufacturing processes.</li> </ul>
3	I can understand how design criteria and constraints limit material choices for a design.	<ul style="list-style-type: none"> <li>I can explain how factors such as cost, durability, weight, and environmental impact affect material selection.</li> <li>I can discuss how design constraints like size or strength influence the choice of materials for a product.</li> <li>I can identify examples where design criteria directly impacted material selection.</li> </ul>
<p><b>Lesson 3.2 More Than Parts</b></p> <p>Students are introduced to the concept of human-centered design as they are led through a design experience focused on user needs, perceptions and behaviors and the design trade-offs necessary in every design process. Students also apply systems thinking to engineering design and consider the ethical implications of engineering decisions. A modern CAD feature, generative design is introduced as a tool to optimize design solutions. Students use the output from a generative design algorithm to explore and select a design alternative. Finally in pairs, students identify a product and apply human-centered design principles and systems thinking to design a product as they practice collaboration and communication skills. Final products are presented through a short commercial.</p>		
4	I can understand the benefits of human-centered design.	<ul style="list-style-type: none"> <li>I can explain what human-centered design is and why it focuses on the end user's needs.</li> <li>I can identify how human-centered design improves product usability, accessibility, and overall user experience.</li> <li>I can provide examples of products that were enhanced by using human-centered design principles.</li> </ul>
5	I can understand the importance of clear, accurate, and detailed communication among all involved in the design, manufacturing, and distribution process.	<ul style="list-style-type: none"> <li>I can describe how communication impacts the efficiency and success of the design and manufacturing process.</li> <li>I can identify potential issues that can arise from poor communication in product development.</li> <li>I can explain how accurate documentation, such as technical drawings and specifications, helps avoid misunderstandings.</li> </ul>
6	I can understand why it is important to study a product's life cycle.	<ul style="list-style-type: none"> <li>I can explain the concept of a product life cycle and its stages (design, manufacturing, use, disposal).</li> <li>I can discuss the environmental, economic, and social impacts of each stage of the product life cycle.</li> <li>I can analyze how understanding a product's life cycle can lead to more sustainable design choices.</li> </ul>
<p><b>Lesson 3.3 Solve a Problem</b> In teams, students act as an engineering consultant group to solve a problem from a list of problems gathered from school and/or community stakeholders. As part of the design process, the team applies the engineering design process to develop a sustainable solution that includes consideration of material choices and the life cycle of the design solution. As part of the design process students meet with the client to understand user needs, develop effective design criteria to inform the design and create a project design brief. Students also practice important project management skills including developing a task and delivery schedule to manage and monitor project work and periodically reporting out on project process.</p>		
7	I can understand the concept of team norms and why they matter.	<ul style="list-style-type: none"> <li>I can define team norms and explain how they contribute to team collaboration and productivity.</li> <li>I can identify examples of positive and negative team norms in a design team setting.</li> <li>I can describe how adhering to team norms helps maintain a healthy, efficient working environment.</li> </ul>
8	I can understand the key questions to ask themselves before beginning a project.	<ul style="list-style-type: none"> <li>I can identify critical questions to ask before starting a project, such as "What is the problem?" and "Who is the end user?"</li> <li>I can explain how these questions guide the planning and design phases of a project.</li> <li>I can describe how answering these questions helps focus the project's objectives and leads to better design outcomes.</li> </ul>

<b>Unit Title:</b>	
Unit 4: Making Things Move	
<b>Unit Description:</b>	
Unit 4 builds students' basic engineering knowledge related to simple mechanical and electrical systems and the use of mathematical models to represent design ideas and to inform design decisions. Students will apply their new knowledge in the design of an electromechanical solution. Students also learn advanced CAD skills to support the design, documentation, and communication of engineering solutions.	
<b>Relevant Standards: Bold indicates priority</b>	
Common Core State Standards for English Language Arts Common Core State Standards for Mathematics Next Generation Science Standards	
<b>Standards for Technological and Engineering Literacy</b>	
<b>Essential Question(s):</b>	<b>Enduring Understanding(s):</b>
<ol style="list-style-type: none"> <li>1. What are the benefits of parametric modeling?</li> <li>2. How can you use a graph to describe motion?</li> <li>3. How are force and motion related?</li> <li>4. How can friction be helpful in a vehicle?</li> <li>5. How are current, voltage, and resistance related in an electrical circuit?</li> <li>6. Why is safety of the utmost importance when working with electricity or electronics?</li> <li>7. What is the difference between a DC and AC circuit?</li> <li>8. How should one decide what information and/or artifacts to include in a portfolio?</li> <li>9. Why should a portfolio include documentation of the complete design process?</li> </ol>	<ol style="list-style-type: none"> <li>1. Students will understand that parametric modeling allows for easy changes to designs by adjusting key dimensions, which automatically updates the rest of the model, improving efficiency and flexibility in design.</li> <li>2. Students will recognize that a graph can visually show how an object moves over time, helping to analyze speed, direction, and acceleration.</li> <li>3. Students will understand that force and motion are connected—force causes objects to move, and motion can be measured and analyzed to understand the effect of different forces.</li> <li>4. Students will recognize that friction can be useful in vehicles by providing the necessary grip for tires to move safely, control speed, and stop effectively.</li> <li>5. Students will understand that in an electrical circuit, current, voltage, and resistance are related through Ohm's Law, which helps determine how electricity flows through a circuit.</li> <li>6. Students will understand that safety is critical when working with electricity or electronics to prevent accidents, injuries, and damage to equipment due to electrical hazards.</li> <li>7. Students will differentiate between DC (direct current) and AC (alternating current) circuits, understanding how each type of current flows and its uses in different applications.</li> <li>8. Students will understand that when creating a portfolio, it's important to choose artifacts that show the process, challenges, and solutions in their design, demonstrating growth and learning.</li> <li>9. Students will recognize that a portfolio should include documentation of the complete design process to show how they arrived at a solution, reflecting their creativity, problem-solving, and decision-making.</li> </ol>
<b>Demonstration of Learning:</b>	<b>Pacing for Unit</b>
Students demonstrate learning by applying their understanding of mechanical systems and mathematical modeling to design and build an electromechanical solution, showcasing their knowledge through detailed	40 Full Class Periods

engineering drawings, calculations, a functional prototype, and a comprehensive presentation explaining their design process and reasoning; this typically involves using CAD software to create detailed models, conducting experiments to test their design, and effectively communicating their findings to an audience.			
<b>Family Overview (link below)</b>			<b>Integration of Technology:</b>
<a href="#">Family Overview - PLTW Intro to Engineering Design</a> <a href="#">Family Overview - PLTW Intro to Engineering Design (Spanish)</a>			MasterCam CAD Software
<b>Unit-specific Vocabulary:</b>			<b>Aligned Unit Materials, Resources, and Technology (beyond core resources):</b>
Assembly	Degree of freedom	Solid modeling	N/A
Assembly drawing	Extrusion	Subassembly	
Component	Geometric constraint	Translation	
CAD (Computer-Aided Design)	Model	Working drawing	
Cartesian coordinate system	Origin	Annotate	
	Prototype	Feature	
		Revolution	
		Constraint	
<b>Opportunities for Interdisciplinary Connections:</b>			<b>Anticipated misconceptions:</b>
<ul style="list-style-type: none"> <li>• Social Studies/History: Ethics in manufacturing (historical context, labor movements, industrialization).</li> <li>• Environmental Science: Ethics in manufacturing and life cycle analysis (environmental impact, sustainability).</li> <li>• Mathematics: Design criteria and constraints, project planning (calculations for material selection, project budgets, and timelines).</li> <li>• Physics: Material properties for design (tensile strength, thermal conductivity, force, motion).</li> <li>• Psychology: Human-centered design (understanding user needs, cognitive behavior).</li> <li>• Art/Design: Aesthetic considerations in human-centered design (visual design, product styling).</li> <li>• Economics: Product life cycle (cost analysis, economic viability, resource allocation).</li> <li>• English/Language Arts: Communication (writing project plans, proposals, and documentation).</li> </ul>			<ul style="list-style-type: none"> <li>• Ethics only matter if the product is harmful or dangerous.</li> <li>• More expensive materials are always better because they result in better performance.</li> <li>• Human-centered design is only about making products look good and attractive.</li> <li>• A product's life cycle only matters after it has been released to the market.</li> <li>• You only need to ask questions about what the project looks like at the end.</li> </ul>
<b>Connections to Prior Units:</b>			<b>Connections to Future Units:</b>
<b>Unit 1: Design and Problem Solving</b> <ul style="list-style-type: none"> <li>• In Unit 1, students learn how to define problems and find solutions. In Unit 4, they apply these skills to design systems that move, using the same problem-solving steps to create functional movement.</li> </ul> <b>Unit 2: Assembly Design</b> <ul style="list-style-type: none"> <li>• Unit 2 teaches students how to put different parts together. In Unit 4, they use this knowledge to design moving parts, ensuring everything fits and works properly.</li> </ul> <b>Unit 3: Thoughtful Product Design</b>			N/A

<ul style="list-style-type: none"> <li>In Unit 3, students learn how to design products that are functional and user-friendly. In Unit 4, they apply these ideas to moving systems, making sure the movement is practical, safe, and easy to use.</li> </ul>	
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**Differentiation through *Universal Design for Learning***

UDL Indicator	Teacher Actions:
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1. Representation	<ul style="list-style-type: none"> <li><b>Dynamic Visualizations:</b> Use animations and simulations to demonstrate mechanical and electrical systems in action. This helps students visualize concepts such as forces, motion, and circuit behavior.</li> <li><b>Hands-On Demonstrations:</b> Conduct live demonstrations or use video tutorials to showcase simple mechanical and electrical systems, allowing students to observe how these systems function in real time.</li> <li><b>Mathematical Modeling Tools:</b> Introduce software tools that allow students to create and manipulate mathematical models of electromechanical systems. This enables them to see how changes in variables affect system performance.</li> <li><b>Annotated Diagrams:</b> Provide diagrams of mechanical systems and electrical circuits with annotations explaining key components and their functions. This aids in understanding complex systems.</li> </ul>
2. Engagement	<ul style="list-style-type: none"> <li><b>Real-World Scenarios:</b> Present students with real-world problems or scenarios that require the design of electromechanical solutions. This encourages them to apply their knowledge in a meaningful context.</li> <li><b>Interactive Workshops:</b> Organize hands-on workshops where students can collaboratively build simple mechanical and electrical systems, fostering engagement through active participation.</li> <li><b>Choice in Projects:</b> Allow students to select projects that interest them, such as designing a simple robot or automated device, to increase motivation and ownership of their learning.</li> </ul>
3. Action and Expression	<ul style="list-style-type: none"> <li><b>Flexible Design Presentations:</b> Encourage students to present their electromechanical designs using various formats (e.g., videos, digital portfolios, or live demonstrations), allowing them to choose the medium that best showcases their work.</li> <li><b>Collaborative Problem-Solving:</b> Implement team-based activities where students design, build, and test electromechanical solutions together. This encourages collaboration and diverse problem-solving approaches.</li> <li><b>Iterative Design Process:</b> Promote an iterative design process where students can test their prototypes, gather feedback, and make improvements based on their observations and results.</li> <li><b>Reflective Practices:</b> Encourage students to document their design process, challenges encountered, and solutions developed in a reflective journal, fostering self-assessment and critical thinking.</li> </ul>

**Supporting Multilingual/English Learners**

Related <i>CELP standards:</i>	Learning Targets:
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1. I can explain the advantages of parametric modeling in engineering design.	<p>Level 1: I can identify and name basic terms related to parametric modeling with support from visuals or examples.</p> <p>Level 2: I can describe one advantage of parametric modeling in simple terms, using sentence frames or keywords.</p> <p>Level 3: I can explain at least two advantages of parametric modeling in engineering design, using complete sentences and some technical vocabulary.</p> <p>Level 4: I can articulate multiple advantages of parametric modeling, providing examples and connecting ideas to real-world applications in engineering design.</p> <p>Level 5: I can critically evaluate the advantages of parametric modeling in engineering design, comparing it to traditional modeling techniques and discussing implications for efficiency and innovation.</p>
2. I can interpret and create graphs to describe an object's motion.	<p>Level 1: I can recognize basic graphs and identify key components (axes, labels) with support.</p> <p>Level 2: I can interpret simple graphs to describe an object's motion, identifying trends (e.g., increasing or decreasing).</p> <p>Level 3: I can create basic graphs to represent an object's motion, including labeling axes and providing a title.</p> <p>Level 4: I can analyze and interpret complex graphs, explaining the relationship between variables and describing the motion of the object in detail.</p> <p>Level 5: I can create and interpret sophisticated graphs, offering insights into the motion of an object, predicting future motion, and justifying conclusions with data.</p>
3. I can explain the relationship between force and motion using Newton's Laws.	<p>Level 1: I can identify basic terms related to force and motion with support.</p> <p>Level 2: I can describe one of Newton's Laws of Motion in simple terms, explaining its connection to force and motion.</p>

- Level 3: I can explain all three of Newton's Laws of Motion and how each law relates to the concepts of force and motion, using examples.
- Level 4: I can analyze real-world scenarios applying Newton's Laws, discussing how they explain various motions and forces in everyday life.
- Level 5: I can evaluate complex systems involving force and motion, applying Newton's Laws to predict outcomes and explain their significance in physics and engineering.
4. I can describe how friction impacts the movement and safety of vehicles.
- Level 1: I can identify basic terms related to friction and vehicle movement with support.
- Level 2: I can describe one way friction affects the movement of vehicles in simple terms.
- Level 3: I can explain multiple ways friction impacts vehicle movement and safety, using complete sentences and examples.
- Level 4: I can analyze different types of friction (e.g., static, kinetic) and their effects on vehicle performance and safety in various driving conditions.
- Level 5: I can evaluate the role of friction in vehicle design and safety features, discussing how different materials and designs can enhance or reduce friction for optimal performance.
5. I can explain the relationship between current, voltage, and resistance using Ohm's Law.
- Level 1: I can identify basic terms like current, voltage, and resistance with support.
- Level 2: I can describe Ohm's Law in simple terms, stating the relationship between current, voltage, and resistance.
- Level 3: I can explain Ohm's Law using a formula and provide examples of how changing one variable affects the others.
- Level 4: I can analyze scenarios involving Ohm's Law, explaining real-world applications and implications of the relationship between current, voltage, and resistance.
- Level 5: I can evaluate and apply Ohm's Law in complex circuits, discussing its significance in electrical engineering and providing detailed examples of its practical applications.
6. I can explain the importance of safety when working with electrical components.
- Level 1: I can recognize basic safety terms related to electrical components with support.
- Level 2: I can describe one safety rule for working with electrical components in simple terms.
- Level 3: I can explain multiple safety practices that should be followed when working with electrical components, using complete sentences.
- Level 4: I can analyze safety scenarios in electrical work, discussing the consequences of ignoring safety measures and the importance of following them.
- Level 5: I can evaluate complex safety situations involving electrical components, proposing solutions and justifying the importance of safety protocols in preventing accidents.
7. I can compare and contrast direct current (DC) and alternating current (AC) circuits.
- Level 1: I can identify basic terms related to DC and AC circuits with support.
- Level 2: I can describe one difference between DC and AC circuits in simple terms.
- Level 3: I can explain at least two similarities and two differences between DC and AC circuits, using complete sentences.
- Level 4: I can analyze the advantages and disadvantages of DC and AC circuits, providing examples of where each type is used.
- Level 5: I can evaluate the applications of DC and AC circuits in various technologies, discussing their impact and relevance in modern electrical engineering.
8. I can evaluate and select relevant materials for an engineering portfolio.
- Level 1: I can identify basic materials related to engineering portfolios with support.
- Level 2: I can describe one type of material that could be included in an engineering portfolio in simple terms.
- Level 3: I can explain multiple relevant materials for an engineering portfolio, using complete sentences and examples to support my choices.
- Level 4: I can analyze the importance of different materials in an engineering portfolio, discussing how they showcase skills and projects effectively.
- Level 5: I can evaluate and justify the selection of materials for an engineering portfolio, considering factors such as audience, purpose, and professional presentation, and I can create a cohesive and impactful portfolio.
9. I can explain why documenting the design process is essential in engineering.
- Level 1: I can identify basic terms related to the design process and documentation with support.
- Level 2: I can describe one reason why documenting the design process is important in simple terms.
- Level 3: I can explain multiple reasons why documenting the design process is essential in engineering, using complete sentences and examples.
- Level 4: I can analyze the consequences of poor documentation in engineering projects, discussing how it affects collaboration, communication, and project outcomes.
- Level 5: I can evaluate best practices for documenting the design process, discussing its long-term benefits for professional development, knowledge transfer, and innovation in engineering.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
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Lesson 4.1 You've Got to Move It

Students begin the lesson by reverse engineering a mechanical device to identify simple machines and mechanisms that influence motion and contribute to the function of the device. Students identify different types of motion

(rotary, oscillating, linear, reciprocating, and so on) and investigate mechanisms that cause motion (including cams, gears, pulleys, chain and sprockets) and later use these mechanisms to create, transform and control motion to solve a problem. Students take a deep dive into how cams transform motion and use motion graphs to design a cam to create a desired motion. They practice CAD skills by developing models of the mechanisms they investigate and simulating motion in the CAD environment. To support efficient CAD modeling, students also learn to use mathematical functions to represent relationships in dimensional properties of a modeled object within the 3D environment.

1	I can explain the advantages of parametric modeling in engineering design.	<ul style="list-style-type: none"> <li>I can define parametric modeling and describe how it is used in engineering.</li> <li>I can explain how parametric modeling improves efficiency, accuracy, and flexibility in design.</li> <li>I can demonstrate how modifying one parameter affects an entire model.</li> </ul>
2	I can interpret and create graphs to describe an object's motion.	<ul style="list-style-type: none"> <li>I can identify key components of a motion graph (position-time and velocity-time graphs).</li> <li>I can analyze a motion graph to determine speed, velocity, and acceleration.</li> <li>I can create a motion graph based on real-world data or a given scenario.</li> </ul>

#### Lesson 4.2 May the Force Be With You

In lesson 4.2 students investigate forces that resist motion. First students study spring forces and develop a mathematical model to determine the relationship between spring displacement and force for a given spring. Students then use a spring scale to study the force of friction and consider ways to reduce friction, especially in machine design. Finally, students apply their knowledge of mechanisms, springs and friction to design an automaton to create a desired motion with minimal frictional resistance. As part of the automata design process, each student creates a CAD assembly model of their design, CAD technical drawings, and a physical working model of their design.

3	I can explain the relationship between force and motion using Newton's Laws.	<ul style="list-style-type: none"> <li>I can define force and motion and describe how they interact.</li> <li>I can explain Newton's Laws of Motion and apply them to real-world examples.</li> <li>I can predict how an object will move when forces are applied to it.</li> </ul>
4	I can describe how friction impacts the movement and safety of vehicles.	<ul style="list-style-type: none"> <li>I can explain how friction between tires and the road affects acceleration, braking, and control.</li> <li>I can describe different ways engineers optimize friction for safety (e.g., tire tread design, road surfaces).</li> <li>I can analyze a real-world situation where friction is beneficial in vehicle performance.</li> </ul>

#### Lesson 4.3 Automating Motion

In lesson 4.3 students learn about simple electrical circuits and how to transform electrical power to motion using a motor. Students design and install a circuit to run a hobby motor to power their previously designed automaton. Students build a simple variable resistor as part of their circuit and develop a mathematical model to inform the design of a motor speed control mechanism. Students then revise their physical automaton to incorporate the new electrical system and demonstrate their use of the resulting electromechanical system to control the automaton motion.

5	I can explain the relationship between current, voltage, and resistance using Ohm's Law.	<ul style="list-style-type: none"> <li>I can define current, voltage, and resistance.</li> <li>I can apply Ohm's Law (<math>V = IR</math>) to calculate unknown values in a circuit.</li> <li>I can analyze how changes in resistance affect current and voltage.</li> </ul>
6	I can explain the importance of safety when working with electrical components.	<ul style="list-style-type: none"> <li>I can identify potential hazards when working with electricity and electronics.</li> <li>I can describe safety procedures and personal protective equipment (PPE) used in electrical work.</li> <li>I can demonstrate proper safety practices when handling electrical circuits.</li> </ul>

7	I can compare and contrast direct current (DC) and alternating current (AC) circuits.	<ul style="list-style-type: none"> <li>• I can define and describe how DC and AC circuits function.</li> <li>• I can explain common applications of DC and AC in real-world systems.</li> <li>• I can analyze and determine which type of circuit is best suited for a given application.</li> </ul>
<p><b>Lesson 4.4 Make It Move</b></p> <p>In the final lesson of Unit 4, students collaborate to develop an electromechanical system to solve a problem. To solve the problem, team members work closely together to apply the knowledge and skills they have gained in this course and create a public display to present the solution.</p>		
8	I can evaluate and select relevant materials for an engineering portfolio.	<ul style="list-style-type: none"> <li>• I can identify key components of an effective engineering portfolio.</li> <li>• I can choose artifacts that showcase my skills, knowledge, and growth.</li> <li>• I can organize my portfolio to highlight my best work and learning progress.</li> </ul>
9	I can explain why documenting the design process is essential in engineering.	<ul style="list-style-type: none"> <li>• I can describe the steps of the engineering design process.</li> <li>• I can explain how documentation helps track progress, justify decisions, and support innovation.</li> <li>• I can create a portfolio that demonstrates my problem-solving process from start to finish.</li> </ul>

Course Title	Content Area	Grade Level:	Credit (if applicable)
Tools and Materials	CTE	9-12	0.5 Credit

**Course Description**

This laboratory-based exploratory course introduces students to a variety of materials and to the tools and machines used to process them. Materials utilized may include woods, metals, and plastics. A variety of manufacturing processes will be surveyed, including separating, forming, combining, joining, conditioning, and finishing. The hands-on instructional aspects of this course focus on proper operating procedures and safe operation of tools and machines.

**Aligned Core Resources** **Connection to the *BPS Vision of the Graduate***

<a href="#">CCTC Standards (CTE)</a>	<p><b>CONTENT MASTERY</b></p> <ul style="list-style-type: none"> <li>Develop and draw from a baseline understanding of knowledge in academic disciplines from our Bristol curriculum.</li> </ul> <p><b>CRITICAL THINKING AND PROBLEM SOLVING</b></p> <ul style="list-style-type: none"> <li>Collect, assess and analyze relevant information</li> <li>Reason effectively. Use systems thinking.</li> <li>Make sound judgments and decisions. Identify, define and solve authentic problems and essential questions.</li> <li>Reflect critically on learning experience, processes and solutions.</li> <li>Transfer knowledge to other situations.</li> </ul>
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**Additional Course Information: Knowledge/Skill Dependent courses/prerequisites** **Link to *Completed Equity Audit***

None	<a href="#">Tools &amp; Materials - Equity Curriculum Review (2025)</a>
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**Standard Matrix**

Standard	Unit 1	Unit 2	Unit 3	Unit 4
CCTC - AC - Use vocabulary, symbols and formulas common to architecture and construction.	X			
CCTC - AC-CST - Compare and contrast the building systems and components required for a construction project.		X		X
CCTC - AC - Comply with regulations and applicable codes to establish and manage a legal and safe workplace.			X	X
CCTC - AC -Use architecture and construction skills to create and manage a project				X

**Unit Links**

- [Unit 1: Measurements](#)
- [Unit 2: Materials](#)
- [Unit 3: Safety](#)
- [Unit 4: Tools and Material Processing](#)

Unit Title		
Unit 1: Measurements		
Relevant Standards: Bold indicates priority		
CCTC - AC 1 - Use vocabulary, symbols and formulas common to architecture and construction.		
Essential Question(s)	Enduring Understanding(s)	
Can you measure to the nearest 1/16 of an inch?	Learning how to measure properly is a skill that is beneficial in everyday life.	
Demonstration of Learning	Pacing for Unit	
<ul style="list-style-type: none"> <li>Written documents</li> <li>Formative and Summative Assessment</li> </ul>	3 Days	
Family Overview (link below)	Integration of Technology	
<a href="#">Tools &amp; Materials - Family Overview (2025)</a>	N/A	
Unit-specific Vocabulary	Aligned Unit Materials, Resources, and Technology (beyond core resources)	
Ruler, Tape Measure, 1/16th's, Inches, feet, millimeter, centimeter, meter.	N/A	
Opportunities for Interdisciplinary Connections	Anticipated misconceptions	
Students will use and reinforce what they learned in math classes regarding the relationship between fractions and decimals, addition and subtraction of fractions.	Students may struggle with reading a ruler and understanding what each mark means on a ruler.	
Connections to Prior Units	Connections to Future Units	
N/A	Students will be using measurements throughout the course on various projects.	
Differentiation through <i>Universal Design for Learning</i>		
UDL Indicator and Teacher Actions		
<p>Representation</p> <ul style="list-style-type: none"> <li>Use color-coded rulers with labeled increments for better differentiation of whole inches, half-inch, quarter-inch, etc.</li> <li>Provide diagram posters showing measurement breakdowns.</li> <li>Offer fraction equivalency charts with visuals to support simplification (e.g., showing 8/16 and 1/2 as equal).</li> <li>Use demonstration videos or AR/VR tools to show real-world applications.</li> <li>Provide digital measurement tools (e.g., virtual rulers, online fraction games).</li> <li>Offer verbal explanations alongside written instructions.</li> </ul> <p>Action &amp; Expression</p> <ul style="list-style-type: none"> <li>Allow students to physically manipulate rulers and tape measures to explore increments.</li> <li>Use tangible fraction tiles or folded paper strips to show measurement divisions.</li> <li>Provide sentence starters for explanations (e.g., "This mark is __ inches because...").</li> <li>Use peer teaching where students explain a measurement process to a partner.</li> </ul> <p>Engagement</p> <ul style="list-style-type: none"> <li>Connect measurements to real woodworking projects (e.g., building a small shelf).</li> <li>Allow students to choose a woodworking project that involves applying measurements.</li> <li>Use examples from students' backgrounds (e.g., measuring in different construction styles or traditional woodworking).</li> <li>Encourage students to compare measurement systems (e.g., metric vs. imperial).</li> </ul>		
Supporting Multilingual/English Learners		
Related <i>CELP standards:</i>	Learning Targets	
CELP Level	LT 1	LT 2
Emerging	<ul style="list-style-type: none"> <li>Recognizes and points to ruler markings with visual or gesture-based support.</li> <li>Names basic increments with a word bank or</li> </ul>	<ul style="list-style-type: none"> <li>Recognizes visual fraction models</li> <li>Identifies equivalent fractions with the support of charts or manipulatives.</li> </ul>

	<ul style="list-style-type: none"> <li>bilingual glossary.</li> <li>Uses sentence starters to explain markings</li> <li>Copies measurements with modeling from the teacher or a peer.</li> <li>Uses pre-marked templates or traces existing measurements.</li> <li>Describes measurement placement using basic phrases</li> </ul>	<ul style="list-style-type: none"> <li>Answers yes/no questions about simplification</li> <li>Matches fractions to simplified forms using visual aids.</li> <li>Reduces fractions by recognizing common patterns</li> <li>Uses sentence frames</li> </ul>	
Expanding	<ul style="list-style-type: none"> <li>Names all ruler increments and describes spacing patterns</li> <li>Explains where a measurement is found using simple sentences.</li> <li>Uses comparisons</li> <li>Accurately marks measured points and explains steps for transferring measurements.</li> <li>Uses sequencing words to describe the process</li> <li>Asks for clarification when needed using content-specific language</li> </ul>	<ul style="list-style-type: none"> <li>Uses step-by-step reasoning to determine if a fraction can be simplified.</li> <li>Explains simplification using basic mathematical language</li> <li>Identifies real-world examples of fraction simplification</li> <li>Independently reduces fractions and explains how</li> <li>Applies simplification when reading or writing measurements.</li> <li>Uses complete sentences with some academic vocabulary</li> </ul>	
Bridging	<ul style="list-style-type: none"> <li>Explains precisely how ruler increments relate to each other.</li> <li>Uses technical vocabulary to describe measurements</li> <li>Justifies answers using mathematical reasoning</li> <li>Explains why certain measuring techniques improve accuracy.</li> <li>Uses self-correction strategies</li> <li>Writes or speaks using detailed multi-step instructions for measuring and cutting wood.</li> </ul>	<ul style="list-style-type: none"> <li>Uses formal mathematical reasoning</li> <li>Justifies simplification choices with evidence</li> <li>Applies fraction simplification automatically while working with measurements.</li> <li>Explains the impact of simplification in practical contexts</li> <li>Teaches peers how to simplify fractions using academic and technical vocabulary.</li> </ul>	
Lesson Sequence	Learning Target	Success Criteria/Assessment	
1	I can accurately measure to the nearest 1/16th of an inch.	<ul style="list-style-type: none"> <li>I can identify and explain the markings on a standard ruler or tape measure, including whole inches, half-inch, quarter-inch, eighth-inch, and sixteenth-inch increments.</li> <li>I can transfer accurate measurements onto wood for cutting, drilling, or assembling.</li> </ul>	
2	I can accurately reduce fractions as necessary.	<ul style="list-style-type: none"> <li>I can identify when a fraction can be simplified.</li> <li>I can simplify fractions in woodworking measurements (e.g., reducing 8/16 to 1/2 inch).</li> </ul>	

Unit Title	
Unit 2: Materials	
Relevant Standards: Bold indicates priority	
CCTC - AC-CST - Compare and contrast the building systems and components required for a construction project.	
Essential Question(s)	Enduring Understanding(s)
How can selecting the proper material lead to a product which can meet strength, durability, cost and aesthetics constraints?	<ul style="list-style-type: none"> <li>Material selection involves balancing properties, cost, availability, and environmental impact.</li> <li>Wood properties and applications are determined by its deciduous or coniferous origin.</li> <li>Ferrous and non-ferrous metals differ significantly in magnetic properties, corrosion resistance, and uses.</li> <li>The diverse structures and properties of thermoplastics, thermosets, and elastomers dictate their wide range of polymer applications.</li> <li>Composites combine materials to achieve enhanced properties beyond those of individual components.</li> </ul>
Demonstration of Learning	Pacing for Unit
<ul style="list-style-type: none"> <li>Formative and summative assessments</li> <li>Project design demonstrating why they chose the best material</li> </ul>	7 Days
Family Overview (link below)	Integration of Technology
<a href="#">Tools &amp; Materials - Family Overview (2025)</a>	N/A
Unit-specific Vocabulary	Aligned Unit Materials, Resources, and Technology (beyond core resources)
Ferrous, non-ferrous, composite, coniferous, deciduous, malleable, ductility, insulator, conductor, engineered lumber	N/A
Opportunities for Interdisciplinary Connections	Anticipated misconceptions
Students will use and reinforce what they may have learned in science classes such as chemistry and biology regarding the lifecycle of a material.	<ul style="list-style-type: none"> <li>All woods are the same and have no direct impact on the impact of a project</li> <li>The cost of a material is the only thing that should be considered when choosing the best material for a project.</li> <li>Plastic, fiberglass, carbon fiber and kevlar are all the same basic thing.</li> </ul>
Connections to Prior Units	Connections to Future Units
How wood is sold related to how a particular size is determined	Material selection based upon project constraints
Differentiation through <a href="#">Universal Design for Learning</a>	
UDL Indicator and Teacher Actions	
Representation <ul style="list-style-type: none"> <li>Provide diverse resources, such as diagrams, videos, or hands-on demonstrations of material properties, to cater to different learning styles.</li> </ul> Action and Expression <ul style="list-style-type: none"> <li>Facilitate student exploration by providing opportunities to test materials, such as strength tests or cost evaluations, and allow them to reflect on their choices.</li> </ul> Engagement <ul style="list-style-type: none"> <li>Use case studies of successful product designs or failures to spark discussion about the importance of selecting the right material. Encourage students to share their opinions on how different materials affect their own daily experiences.</li> </ul>	
Supporting Multilingual/English Learners	

Related <b>CELP standards:</b>			Learning Targets			
CELP Level	LT 1	LT 2	LT 3	LT 4	LT 5	LT 6
Emerging	Identifies <i>one</i> basic factor influencing material choice (e.g., "It needs to be strong" or "It shouldn't cost too much") and gives a simple example.	Names at least <i>two</i> broad categories of wood (e.g., hardwood and softwood) and gives one example of each.	Names at least <i>one</i> type of engineered lumber (e.g., plywood) and states <i>one</i> thing it's used for.	Recognizes common nominal lumber dimensions (e.g., 2x4) and relates them to the idea of standard sizing.	Names at least <i>two</i> common types of metal (e.g., steel, aluminum) and states <i>one</i> general use for each.	Names at least <i>two</i> common types of plastic (e.g., water bottle plastic, grocery bag plastic) and states <i>one</i> common use for each.
Expanding	Identifies <i>multiple</i> factors contributing to material selection (e.g., strength, cost, weight, appearance) and provides basic explanations of their importance for different general applications.	Describes <i>several</i> classifications of wood (e.g., hardwood vs. softwood, domestic vs. imported, coniferous vs. deciduous) and provides examples for each, explaining a basic difference between the categories.	Describes the basic characteristics (e.g., made of layers, strong) and identifies <i>multiple</i> uses and benefits of <i>several</i> types of engineered lumber (e.g., plywood, OSB, MDF).	Explains the difference between nominal and actual lumber dimensions and describes how standard sizing impacts purchasing and construction, possibly identifying common thicknesses and widths for different lumber types.	Describes basic characteristics (e.g., strength, conductivity, malleability) and identifies <i>multiple</i> uses and benefits of <i>several</i> common metals (e.g., steel, aluminum, copper, brass).	Describes basic characteristics (e.g., flexibility, durability, transparency) and identifies <i>multiple</i> uses and benefits of <i>several</i> types of plastics (e.g., PET, HDPE, PVC), possibly distinguishing between thermoplastics and thermosets in a basic way.
Bridging	Explains <i>how</i> several interacting factors influence material selection for a <i>specific</i> application, justifying reasoning with details about material properties and the demands of the application, perhaps considering trade-offs.	Explains the <i>basis</i> for different wood classifications (e.g., botanical origin, density, grain structure) and discusses how these classifications relate to the properties and typical uses of different types of wood.	Explains <i>how</i> the manufacturing process of different engineered lumber products results in specific characteristics and benefits, and analyzes why a particular type of engineered lumber might be chosen over solid lumber for a given application.	Explains the reasons behind nominal sizing conventions, discusses how these standards facilitate trade and construction, and perhaps understands how moisture content affects final dimensions.	Explains <i>how</i> the atomic structure and alloying processes of different metals result in specific characteristics and benefits, and analyzes why a particular metal might be chosen for a specific engineering application.	Explains <i>how</i> the chemical structure and processing of different types of plastics result in specific characteristics and benefits, and analyzes the trade-offs between different plastics for a particular application, perhaps considering environmental impacts.
Lesson Sequence	Learning Target		Success Criteria/Assessment			
1	I can explain what factors contribute to a material being selected for an application.		<ul style="list-style-type: none"> <li>I can give three reasons why a material is selected for an intended application</li> </ul>			
2	I can explain the different classifications of wood materials.		<ul style="list-style-type: none"> <li>I can name the two classifications of wood</li> <li>I can name three species for each classification above</li> </ul>			
3	I can describe the characteristics of engineered lumber and know its uses and benefits.		<ul style="list-style-type: none"> <li>I can give four examples of an engineered lumber</li> <li>I can name three the benefits of engineered wood products</li> </ul>			

4	I can explain how wood products are sized for commerce.	<ul style="list-style-type: none"> <li>● I can explain the difference between a board foot, dimensional and nominally sized lumber as well as wood sold by the linear foot</li> </ul>
5	I can describe the characteristics of metal materials and know its uses and benefits.	<ul style="list-style-type: none"> <li>● I can name the two classifications of metals</li> <li>● I can explain the difference between ferrous and non-ferrous metal</li> <li>● I can name three types for each classification above</li> </ul>
6	I can describe the characteristics of different types of plastics and know their uses and benefits.	<ul style="list-style-type: none"> <li>● I can name the two classifications of a polymer</li> <li>● I can name three different composites.</li> <li>● I can name two characteristics for the composite above</li> </ul>

Unit Title	
Unit 3: Safety	
Relevant Standards: Bold indicates priority	
CCTC - AC - Comply with regulations and applicable codes to establish and manage a legal and safe workplace.	
Essential Question(s)	Enduring Understanding(s)
How is incorporating safety important inside and outside the laboratory?	<ul style="list-style-type: none"> <li>• Safety is a top priority in whatever you do.</li> <li>• Tool and machine safety keeps every</li> </ul>
Demonstration of Learning	Pacing for Unit
<ul style="list-style-type: none"> <li>• Formative and summative assessments</li> </ul>	5 Days
Family Overview (link below)	Integration of Technology
<a href="#">Tools &amp; Materials - Family Overview (2025)</a>	N/A
Unit-specific Vocabulary	Aligned Unit Materials, Resources, and Technology (beyond core resources)
OSHA, SDS/MSDS, PPE, Z87	N/A
Opportunities for Interdisciplinary Connections	Anticipated misconceptions
Safety knowledge can be important for other lab based courses such as Science.	<ul style="list-style-type: none"> <li>• Eyewear is not important</li> <li>• Injuries will not happen to me</li> </ul>
Connections to Prior Units	Connections to Future Units
N/A	Use of selected materials for project creation with tools
Differentiation through <a href="#">Universal Design for Learning</a>	
UDL Indicator and Teacher Actions	
<p>Representation</p> <ul style="list-style-type: none"> <li>• Present safety procedures and guidelines in multiple formats (e.g., verbal instructions, visual safety posters, demonstrations, interactive videos) to ensure all students can understand the safety protocols effectively.</li> <li>• Display clear safety posters around the classroom and lab that explain safety rules and emergency procedures.</li> <li>• Verbally walk students through safety procedures, providing step-by-step instructions on handling tools, equipment, and materials.</li> <li>• Show students how to use equipment safely and demonstrate proper safety gear usage.</li> <li>• Use online safety quizzes or interactive simulations to test students' understanding of safety rules before engaging in lab work.</li> </ul> <p>Action and Expression</p> <ul style="list-style-type: none"> <li>• Allow students to practice safety procedures in a controlled environment before they engage in actual work. Provide opportunities to demonstrate their understanding of safety practices both in and outside the lab.</li> <li>• Create hands-on activities where students can practice using safety equipment like goggles, gloves, or lab coats. Make sure they demonstrate proper use before allowing them to begin independent tasks.</li> <li>• Regularly check that students understand and can apply safety procedures. Provide them with safety checklists to complete before they begin any lab activities.</li> <li>• Ask students to explain the importance of each safety measure and how it contributes to maintaining a safe environment.</li> </ul> <p>Engagement</p> <ul style="list-style-type: none"> <li>• Make safety engaging by connecting it to real-life scenarios and the importance of maintaining a safe environment in personal and professional contexts. Help students see the value of safety beyond just classroom rules.</li> <li>• Discuss real-world examples of laboratory accidents (without graphic content) and show how safety protocols could have prevented those incidents. Relate this to industries like construction, healthcare, or engineering where safety is also critical.</li> <li>• Create safety challenges where students must identify potential hazards in a mock setup, explaining how they would mitigate each risk using safety procedures.</li> </ul>	
Supporting Multilingual/English Learners	

Related <i>CELP standards:</i>		Learning Targets		
CELP Standard	LT 1	LT 2	LT 3	LT 4
Emerging	Identifies <i>one</i> or <i>two</i> common examples of PPE (e.g., gloves, safety glasses) and states a <i>basic</i> reason for their use (e.g., "to protect you").	Recognizes that OSHA is an organization related to workplace safety. Might state a simple idea like "they make rules for work."	Identifies <i>one</i> or <i>two</i> basic rules for safe electrical usage (e.g., "don't touch wires," "don't overload outlets").	Identifies <i>one</i> or <i>two</i> visible characteristics of a safe work environment (e.g., "clean floor," "no broken things").
Expanding	Explains the <i>general</i> purpose of PPE as protecting workers from hazards and can name <i>several</i> types of PPE along with the body parts they protect.	Explains that OSHA sets and enforces workplace safety standards to prevent injuries and illnesses. Can identify <i>some</i> of OSHA's responsibilities, such as conducting inspections.	Explains <i>several</i> rules and guidelines for safe electrical usage, such as proper grounding, avoiding damaged cords, and using appropriate tools. Can describe potential hazards of electrical misuse.	Describes <i>several</i> characteristics of a safe work environment, including things like clear pathways, proper lighting, labeled hazards, and accessible safety equipment.
Bridging	Explains the <i>specific</i> purpose of different types of PPE in relation to various workplace hazards. Can analyze a work task and determine the appropriate PPE needed and why.	Explains the <i>comprehensive</i> role of OSHA in ensuring safe and healthy working conditions, including its standard-setting process, enforcement mechanisms, and worker rights. Can discuss the impact of OSHA on workplace safety.	Applies a <i>range</i> of rules and guidelines for safe electrical usage in different scenarios. Can troubleshoot basic electrical safety issues and explain the scientific principles behind safe practices (e.g., grounding paths, circuit overload).	Explains the <i>systemic</i> elements that contribute to a safe work environment, including safety protocols, training programs, hazard identification and control measures, and a safety-conscious culture. Can analyze a workplace and suggest improvements to enhance safety.
Lesson Sequence	Learning Target	Success Criteria/Assessment		
1	I can explain the purpose of PPE	<ul style="list-style-type: none"> <li>I can name different types of PPE to protect the five senses</li> <li>I can name appropriate PPE types to protect each of the human senses</li> </ul>		
2	I explain the purpose of OSHA in the workplace	<ul style="list-style-type: none"> <li>I can explain the purpose of the organization.</li> <li>I can explain how OSHA uses training and fines to encourage workplace safety</li> </ul>		
3	I can apply rules and guidelines of safe electrical usage	<ul style="list-style-type: none"> <li>I can explain what the guidelines are for electrical usage.</li> <li>I can apply safe electric usage rules to a factory setting.</li> </ul>		
4	I can explain what a safe work environment may look like	<ul style="list-style-type: none"> <li>I can explain the importance of lighting and a clean workplace</li> <li>I can explain the importance of appropriate ventilation in the workplace</li> <li>I can use safe work practices when working with tools, materials and machines</li> </ul>		

<b>Unit Title</b>	
Unit 4: Tools and Material Processing	
<b>Relevant Standards: Bold indicates priority</b>	
CCTC - AC -Use architecture and construction skills to create and manage a project. CCTC - AC - Comply with regulations and applicable codes to establish and manage a legal and safe workplace. CCTC - AC-CST - Compare and contrast the building systems and components required for a construction project.	
<b>Essential Question(s)</b>	<b>Enduring Understanding(s)</b>
How can I use my previous knowledge of measurements, materials and safety to complete a project?	This is a culminating unit that will ensure students understand: <ul style="list-style-type: none"> <li>• Accurate measurement is foundational for successful project planning and execution.</li> <li>• Appropriate material selection, informed by understanding material properties, is crucial for creating functional and durable projects.</li> <li>• Adherence to safety protocols is paramount for ensuring well-being and the responsible completion of projects.</li> <li>• The integration of measurement, material knowledge, and safety practices leads to the creation of reliable, long-lasting, and safe outcomes in any project.</li> </ul>
<b>Demonstration of Learning</b>	<b>Pacing for Unit</b>
<ul style="list-style-type: none"> <li>• Written documents</li> <li>• Student created project demonstrating culmination of knowledge from entire course</li> </ul>	26 Days
<b>Family Overview (link below)</b>	<b>Integration of Technology</b>
<a href="#">Tools &amp; Materials - Family Overview (2025)</a>	N/A
<b>Unit-specific Vocabulary</b>	<b>Aligned Unit Materials, Resources, and Technology (beyond core resources)</b>
Band saw, table saw, orbital drum sander, belt/disc sander center punch, awl, scroll saw, coping saw, files, sandpaper drill press, drills, hole saw, forstner bit, grit, finishing	N/A
<b>Opportunities for Interdisciplinary Connections</b>	<b>Anticipated misconceptions</b>
Association to math when adding and subtracting dimensions	<ul style="list-style-type: none"> <li>• Measurements do not need to be accurate</li> <li>• Mistakes can't always be fixed - measure twice/ cut once - don't rush</li> </ul>
<b>Connections to Prior Units</b>	<b>Connections to Future Units</b>
Connection to the units on measurement, materials and safety.	Introductory exposure to tool and materials usage which can be built upon for a subsequent future course
<b>Differentiation through <a href="#">Universal Design for Learning</a></b>	
<b>UDL Indicator and Teacher Actions</b>	
Representation: <ul style="list-style-type: none"> <li>• Provide visual flowcharts or graphic organizers outlining the steps of the design process. Offer examples of how different projects have moved through these stages.</li> <li>• Create a visual library of tools and machines with clear images, labels, and brief descriptions of their function and safety precautions. Use video demonstrations of proper and safe tool use.</li> <li>• Post clear and visual safety rules and procedures throughout the workshop. Use diagrams and models to illustrate safe practices (e.g., proper attire, emergency procedures, tool handling).</li> <li>• Provide multiple examples of technical drawings with varying levels of complexity. Offer visual aids explaining different drawing conventions (e.g., line types, dimensions, symbols). Use 3D models alongside drawings to aid visualization.</li> <li>• Provide physical samples of sandpaper with different grits clearly labeled. Use visual charts or diagrams that</li> </ul>	

show the progression of grits and their typical applications (e.g., rough shaping, fine finishing).

**Action & Expression:**

- Allow students to choose how they document their progress through the design process (e.g., written journal, video log, digital portfolio). Offer templates or sentence starters for each stage.
- Provide students with opportunities to demonstrate their ability to identify tools and explain their safe usage through hands-on activities, verbal explanations, or creating safety posters/guides.
- Have students participate in safety walkthroughs, identify potential hazards, and demonstrate safe practices during activities. Allow them to create safety checklists or presentations for their peers.
- Provide students with opportunities to practice interpreting drawings by answering questions, labeling parts, or creating simple sketches based on drawings. Allow them to create physical models based on technical drawings.
- Have students sort sandpaper by grit, describe the feel of different grits, and explain when to use each grit for various tasks. Allow them to experiment with different grits on sample materials.

**Engagement**

- Begin each workshop session with a brief safety review. Use scenarios or case studies to discuss the importance of safety and the consequences of unsafe actions.
- Incorporate "tool talks" or interactive demonstrations where students can handle (safely) and ask questions about different tools. Connect tool usage to real-world projects and applications that students find motivating.
- Use real-world examples of technical drawings for projects that students are working on or find interesting. Incorporate puzzles or challenges that require interpreting drawings to find solutions.

**Supporting Multilingual/English Learners**

**Related CELP standards:**

**Learning Targets**

CELP Standard	LT 1	LT 2	LT 3	LT 4	LT 5
1. Construct meaning from oral presentations and literary and informational text	Understanding the steps of the design process	Understanding information about tools and safety	Understanding workshop safety rules	Understanding information in technical drawings	Understanding information about sandpaper grits
2. Participate in grade-appropriate oral and written exchanges of information, ideas, and analyses	Discussing design ideas and process with others	Discussing tool usage and safety with others	Discussing safety concerns and procedures	Discussing interpretations of technical drawings	Discussing sandpaper types and applications
3. Speak and write about grade-appropriate complex literary and informational texts and topics	Explaining the stages of the design process	Explaining the safe operation of various tools	Explaining the rationale behind safety practices	Explaining the information conveyed in drawings	Explaining the science behind sandpaper grits
4. Construct grade-appropriate oral and written claims and support them with reasoning and evidence	Justifying design choices based on the process	Justifying the safe usage procedures for tools	Justifying adherence to safety rules	Justifying interpretations of drawing features	Justifying the selection of specific sandpaper grits
5. Conduct research and evaluate and communicate findings to answer questions or solve problems	Researching design methodologies	Researching tool operation and safety guidelines	Researching best workshop safety practices	Researching drawing conventions and standards	Researching sandpaper properties and applications
6. Analyze and critique the arguments of others orally and in writing	Evaluating the effectiveness of different designs	Evaluating the safety explanations of others	Evaluating adherence to safety by others	Evaluating the accuracy of drawing interpretations	Evaluating the appropriateness of sandpaper choices
7. Adapt language choices to purpose, task, and audience when speaking and writing	Explaining the design process to different groups	Explaining tool safety to different audiences	Explaining workshop safety to different groups	Explaining technical drawings to different audiences	Explaining sandpaper grits to different audiences
8. Determine the meaning	Understanding	Understanding	Understanding	Understanding	Understanding

of words and phrases in oral presentations and literary and informational text	design-related terminology	tool names and safety terms	workshop safety vocabulary	technical drawing vocabulary	sandpaper-related terms
9. Create clear and coherent grade-appropriate speech and text	Explaining the design process clearly	Explaining tool safety clearly	Explaining workshop safety clearly	Explaining technical drawings clearly	Explaining sandpaper grits clearly
10. Make accurate use of standard English to communicate in grade appropriate speech and writing	Using correct terminology for design	Using correct terminology for tools and safety	Using correct safety terminology	Using correct technical drawing terminology	Using correct terminology for sandpaper

Lesson Sequence	Learning Target	Success Criteria	Assessment
1	I can properly use the design process to design a project.	<ul style="list-style-type: none"> <li>I can explain the steps of the design process.</li> <li>I can use the design process to create a product to be manufactured.</li> </ul>	Formative assessment, written response, push tool project (5 days)
2	I can properly identify hand/ power tools as well as machines and explain their safe usage to complete a project.	<ul style="list-style-type: none"> <li>I can correctly name and describe the function of each tool and machine used in my project.</li> <li>I can explain the proper handling and operation of each tool and machine.</li> </ul>	Formative assessment, project completion (10 days)
3	I can follow safe workshop practices expected in the laboratory	<ul style="list-style-type: none"> <li>I can work independently or collaboratively while maintaining a safe work environment.</li> </ul>	Formative assessment, project completion
4	I can read and interpret the information contained in a technical drawing to create an object	<ul style="list-style-type: none"> <li>I can differentiate the different views on a technical drawing</li> <li>I can understand the relationship between lines and surfaces of a part between views on a technical drawing</li> <li>I can accurately read a technical drawing to obtain measurements and annotations of features on an object</li> </ul>	Formative assessment, exit slip, quiz
5	I can distinguish between the different sandpaper grits and their usage.	<ul style="list-style-type: none"> <li>I can correctly identify different sandpaper grits by their number (e.g., coarse: 40-60, medium: 80-120, fine: 150-220, extra fine: 240+)</li> <li>I can apply proper sanding techniques, including sanding with the grain and using even pressure.</li> <li>I can maintain a clean work area by managing dust and debris properly.</li> </ul>	Formative assessment, project completion

*On January 9, 2025, a federal district court in Kentucky ruled that the 2024 Title IX Regulations “are invalid and must be set aside.” In response, the U.S. Department of Education’s Office for Civil Rights (OCR) issued guidance indicating, “Consistent with the court’s order, the 2024 Title IX regulations are not effective in any jurisdiction.” Districts are advised to discontinue the use of policies and regulations that follow the 2024 Title IX Regulations and resume using policies and regulations that were in place under the 2020 Regulations. In the absence of additional guidance from OCR, districts should consult with their legal teams to assist through this transition and perhaps future changes.*

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment In The Workplace**

The \_\_\_\_\_ Board of Education (the “Board”) prohibits any form of sex discrimination or sexual harassment in the Board’s education programs and activities, whether by students, Board employees or third parties subject to substantial control by the Board. It is the policy of the Board to maintain a working environment free from harassment, insults or intimidation on the basis of an employee's sex and free from discrimination based on sex.

The Board does not discriminate on the basis of sex in the education programs or activities that it operates and the Board is required by Title IX of the Education Amendments of 1972 and its implementing regulations (“Title IX”), Title VII of the Civil Rights Act of 1964 (“Title VII”), and Connecticut law not to discriminate in such a manner. Discrimination or harassment on the basis of sex includes discrimination or harassment on the basis of gender identity or sexual orientation. Any employee or student who engages in conduct prohibited by this Policy shall be subject to disciplinary action, up to and including termination or expulsion, respectively. Third parties who engage in conduct prohibited by this Policy shall be subject to other sanctions, which may include exclusion from Board property and/or activities. Individuals who engage in acts of sex discrimination or sexual harassment may also be subject to civil and criminal penalties.

For conduct to violate Title IX, the conduct must have occurred in an education program or activity of the Board; the conduct must have occurred within the United States of America; and the complainant must be participating in or attempting to participate in the education program or activity of the Board. Conduct that does not meet these requirements still may constitute a violation of Title VII, Connecticut law, and/or another Board policy.

The Superintendent of Schools shall develop Administrative Regulations, which will include Grievance Procedures implementing this Policy and in accordance with Title IX, Title VII, and Connecticut law (the “Administrative Regulations”).

## Students/Personnel -- Certified/Non-Certified

### Sexual Harassment/Title IX

#### Prohibition of Sex Discrimination and Sexual Harassment In The Workplace (continued)

**Sex discrimination** occurs when an employer refuses to hire, disciplines or discharges any individual, or otherwise discriminates against an individual with respect to his or her compensation, terms, conditions, or privileges of employment on the basis of the individual's sex. Sex discrimination also occurs when a person, because of the person's sex, is denied participation in or the benefits of any education program or activity receiving federal financial assistance.

**Sexual harassment under Title IX** means conduct on the basis of sex that satisfies one or more of the following:

- (1) An employee of the Board conditioning the provision of an aid, benefit, or service of the Board on an individual's participation in unwelcome sexual conduct (*i.e.*, *quid pro quo*);
- (2) Unwelcome conduct determined by a reasonable person to be so severe, pervasive, and objectively offensive that it effectively denies a person equal access to the Board's education programs or activities; or
- (3) "Sexual assault" as defined in 20 U.S.C. 1092(f)(6)(A)(v), "dating violence" as defined in 34 U.S.C. 12291(a)(10), "domestic violence" as defined in 34 U.S.C. 12291(a)(8), or "stalking" as defined in 34 U.S.C. 12291(a)(30).

**Sexual harassment under Title VII and Connecticut law** means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when:

- (1) Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment;
- (2) Submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting such individual; or
- (3) Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment.

#### Reporting Sex Discrimination or Sexual Harassment

It is the policy of the Board to encourage victims of sex discrimination and/or sexual harassment to report such claims. Employees are encouraged to report complaints of sex discrimination and/or sexual harassment promptly in accordance with the appropriate process established in the Administrative Regulations. All complaints are to be responded to in a prompt and equitable manner.

## Students/Personnel -- Certified/Non-Certified

### Sexual Harassment/Title IX

#### Reporting Sex Discrimination or Sexual Harassment (continued)

Individuals who engage in acts of sex discrimination or sexual harassment may also be subject to civil and criminal penalties. Retaliation against any employee with a complaint about sex discrimination or sexual harassment is prohibited under this Policy and illegal under state and federal law.

Any Board employee with notice of sex discrimination and/or sexual harassment allegations shall immediately report such information to the building principal and/or the Title IX Coordinator, or if the employee does not work in a school building, to the Title IX Coordinator.

The \_\_\_\_\_ Public Schools administration (the "Administration") shall provide training to Title IX Coordinator(s), investigators, decision-makers, and any person who facilitates an informal resolution process (as set forth in the Administrative Regulations), which training shall include, but need not be limited to, the definition of sex discrimination and sexual harassment, the scope of the Board's education program and activity, how to conduct an investigation and implement the grievance process, and how to serve impartially, including by avoiding prejudgment of the facts at issue, conflicts of interest, and bias.

The Administration shall make the training materials used to provide these trainings publicly available on the Board's website. The Administration shall also periodically provide training to all Board employees on the topic of sex discrimination and sexual harassment under Title IX, Title VII, and Connecticut law, which shall include when reports of sex discrimination and/or sexual harassment must be made. The Administration shall distribute this Policy and the Administrative Regulations to employees, union representatives, students, parents and legal guardians and make the Policy and the Administrative Regulations available on the Board's website to promote an environment free of sex discrimination and sexual harassment.

The Board's Title IX Coordinator is \_\_\_\_\_, (*insert name and title.*) Any individual may make a report of sex discrimination and/or sexual harassment to any Board employee or directly to the Title IX Coordinator using any one, or multiple, of the following points of contact:

**OFFICE ADDRESS:** \_\_\_\_\_

**ELECTRONIC MAIL ADDRESS:** \_\_\_\_\_

**TELEPHONE NUMBER:** \_\_\_\_\_

Any Board employee in receipt of allegations of sex discrimination or sexual harassment, or in receipt of a formal complaint, shall immediately forward such information to the Title IX Coordinator. Board employees may also make a report of sexual harassment and/or sex discrimination to the U.S. Department of Education: Office for Civil Rights, Boston Office, U.S. Department of Education, 8<sup>th</sup> Floor, 5 Post Office Square, Boston, MA 02109-3921 (Telephone: 617-289-0111).

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Reporting Sex Discrimination or Sexual Harassment** (continued)

Employees may also make a report of sexual harassment and/or sex discrimination to the Connecticut Commission on Human Rights and Opportunities, 450 Columbus Boulevard, Hartford, CT 06103-1835 (Telephone: 860-541-3400 or Connecticut Toll Free Number: 1-800-477-5737).

#### Legal References:

Civil Rights Act of 1964, Title VII, 42 U.S.C. § 2000e-2(a).  
Equal Employment Opportunity Commission Policy Guidance on Current Issues of Sexual Harassment (N-915.050), March 19, 1990.  
Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, et seq.  
Title IX of the Education Amendments of 1972, 34 CFR §106, et seq.  
*Meritor Savings Bank, FSB v. Vinson*, 477 U.S. 57 (1986)  
Conn. Gen. Stat. §46a-54 Commission powers Connecticut  
Conn. Gen. Stat. §46a-60 Discriminatory employment practices prohibited.  
Conn. Gen. Stat. §46a-81c Sexual orientation discrimination: Employment  
Conn. Gen. Stat. §10-153 Discrimination on the basis of sex, gender identity or expression or marital status prohibited  
Conn. Agencies Regs. §§ 46a-54-200 through §46a-54-207

*The grievance procedures in these regulations are legally required.*

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment In The Workplace**

The \_\_\_\_\_ Board of Education (the “Board”) prohibits any form of sex discrimination or sexual harassment in the Board’s education programs and activities, whether by students, Board employees or third parties subject to substantial control by the Board. Discrimination or harassment on the basis of sex includes discrimination or harassment on the basis of gender identity or sexual orientation.

Students, District employees and third parties are expected to adhere to a standard of conduct that is respectful of the rights of students, District employees, and third parties. It is the policy of the Board to maintain a working environment free from harassment, insults or intimidation on the basis of an employee's sex and free from discrimination based on sex. Verbal or physical conduct by a supervisor or co-worker relating to an employee's sex that has the effect of creating an intimidating, hostile or offensive work environment, unreasonably interfering with the employee's work performance, or adversely affecting the employee's employment opportunities is prohibited.

Any employee or student who engages in conduct prohibited by the Board’s Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel) shall be subject to disciplinary action. Any third party who engages in conduct prohibited by the Board’s Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel) shall be subject to remedial measures, which may include exclusion from school property.

**Sex discrimination** occurs when a person, because of the person’s sex, is denied participation in or the benefits of any education program or activity receiving federal financial assistance.

**Sexual harassment under Title IX** means conduct on the basis of sex that satisfies one or more of the following:

- (1) An employee of the Board conditioning the provision of an aid, benefit, or service of the Board on an individual’s participation in unwelcome sexual conduct (i.e., *quid pro quo*);
- (2) Unwelcome conduct determined by a reasonable person to be so severe, pervasive, and objectively offensive that it effectively denies a person equal access to the District’s education programs or activities; or
- (3) “Sexual assault” as defined in 20 U.S.C. 1092(f)(6)(A)(v), “dating violence” as defined in 34 U.S.C. 12291(a)(10), “domestic violence” as defined in 34 U.S.C. 12291(a)(8), or “stalking” as defined in 34 U.S.C. 12291(a)(30). These definitions can be found in Appendix A of these Administrative Regulations.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment In The Workplace**

**Sexual harassment under Title VII and Connecticut law** means unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when:

- (1) Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment;
- (2) Submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting such individual; or
- (3) Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment.

Although not an exhaustive list, the following are other examples of conduct prohibited by the Board's Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel):

1. Unwelcome sexual advances from a co-worker or supervisor, such as unwanted hugs, touches, or kisses;
2. Unwelcome attention of a sexual nature, such as degrading, suggestive or lewd remarks or noises;
3. Dirty jokes, derogatory or pornographic posters, cartoons or drawings;
4. The threat or suggestion that continued employment advancement, assignment or earnings depend on whether or not the employee will submit to or tolerate harassment;
5. Circulating, showing, or exchanging emails, text messages, digital images or websites of a sexual nature;
6. Using computer systems, including email, instant messaging, text messaging, blogging or the use of social networking websites, or other forms of electronic communications, to engage in any conduct prohibited by the Board's Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel).

#### **Notice of The Title IX Coordinator**

The Board's Title IX Coordinator is \_\_\_\_\_, (*insert name and title.*) Any individual may make a report of sex discrimination and/or sexual harassment to any Board employee or directly to the Title IX Coordinator using any one, or multiple, of the following points of contact:

**OFFICE ADDRESS:** \_\_\_\_\_  
**ELECTRONIC MAIL ADDRESS:** \_\_\_\_\_  
**TELEPHONE NUMBER:** \_\_\_\_\_

## Students/Personnel -- Certified/Non-Certified

### Sexual Harassment/Title IX

#### Notice of the Title IX Coordinator (continued)

Any District employee in receipt of allegations of sex discrimination or sexual harassment, or in receipt of a formal complaint, shall immediately forward such information to the Title IX Coordinator. The Title IX Coordinator manages the District's compliance with Title IX, Title VII and Connecticut law with respect to sexual harassment and/or sex discrimination and is an available resource to anyone seeking information or wishing to file a formal complaint of same. When a student, District employee, or other participant in the District's programs and activities feels that such person has been subjected to discrimination on the basis of sex in any District program or activity, including without limitation being subjected to sexual harassment, such person may contact the Title IX Coordinator or utilize the Title IX, Title VII and Connecticut law grievance systems set forth herein to bring concerns forward for the purpose of obtaining a prompt and equitable resolution.

*[Note: Additional Persons May Be Added. The federal regulations provide that each recipient of federal financial assistance must designate and authorize "at least one Employee" to coordinate its efforts to comply with its responsibilities under the federal regulations.]*

#### Explanation of Complaint Process and Procedure

The federal regulations implementing Title IX require the adoption and publication of two separate grievance systems:

- a grievance process for complaints of sex discrimination involving allegations of sexual harassment; and
- grievance procedures for complaints of sex discrimination that are not sexual harassment.

Accordingly, the Administration will process any complaints of sex discrimination involving allegations of sexual harassment, as defined above, pursuant to the **grievance process** set forth in Section I of these regulations. The Administration will process any complaints of sex discrimination that are not sexual harassment pursuant to the **grievance procedures** set forth in Section II of these regulations.

The District will keep confidential the identity of any individual who has made a report or complaint of sex discrimination, including any individual who has made a report or filed a formal complaint of sexual harassment, any complainant, any individual who has been reported to be the perpetrator of sex discrimination, any respondent, and any witness, except as may be permitted by the Family Educational Rights and Privacy Act (FERPA), or as required by law, or to carry out the purposes of these Administrative Regulations, including the conduct of any investigation, hearing, or judicial proceeding arising from these Administrative Regulations.

The obligation to comply with Title IX is not obviated or alleviated by the FERPA.

## Students/Personnel -- Certified/Non-Certified

### Sexual Harassment/Title IX

#### Prohibition of Sex Discrimination and Sexual Harassment In The Workplace

#### Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX

##### A. Definitions

- **Bias** occurs when it is proven that the Title IX Coordinator, investigator(s), and/or decision-maker(s) demonstrate actual bias, rather than the appearance of bias. Actual bias includes, but is not limited to, demonstrated personal animus against the respondent or the complainant and/or prejudgment of the facts at issue in the investigation.
- **Complainant** means an individual who is alleged to be the victim of conduct that could constitute sexual harassment.
- A **conflict of interest** occurs when it is proven that the Title IX Coordinator, investigator(s), and/or decision-maker(s) have personal, financial and/or familial interests that affected the outcome of the investigation.
- **Consent** means an active, clear and voluntary agreement by a person to engage in sexual activity with another person (also referred to hereafter as “affirmative consent”).

For the purposes of an investigation conducted pursuant to these Administrative Regulations, the following principles shall be applied in determining whether consent for sexual activity was given and/or sustained:

- A. Affirmative consent is the standard used in determining whether consent to engage in sexual activity was given by all persons who engaged in the sexual activity.
- B. Affirmative consent may be revoked at any time during the sexual activity by any person engaged in the sexual activity.
- C. It is the responsibility of each person engaging in sexual activity to ensure that the person has the affirmative consent of all persons engaged in the sexual activity to engage in the sexual activity and that the affirmative consent is sustained throughout the sexual activity.
- D. It shall not be a valid excuse to an alleged lack of affirmative consent that the respondent to the alleged violation believed that the complainant consented to the sexual activity:
  - (i) because the respondent was intoxicated or reckless or failed to take reasonable steps to ascertain whether the complainant affirmatively consented, or

## Students/Personnel -- Certified/Non-Certified

### Sexual Harassment/Title IX

#### Prohibition of Sex Discrimination and Sexual Harassment In The Workplace

##### Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX

###### A. Definitions (continued)

(ii) if the respondent knew or should have known that the complainant was unable to consent because such individual was unconscious, asleep, unable to communicate due to a mental or physical condition, unable to consent due to the age of the individual or the age difference between the individual and the respondent, or incapacitated due to the influence of drugs, alcohol or medication.

E. The existence of a past or current dating or sexual relationship between the complainant and the respondent, in and of itself, shall not be determinative of a finding of consent.

- For purposes of investigations and complaints of sexual harassment, **education program or activity** includes locations, events, or circumstances over which the Board exercises substantial control over both the respondent and the context in which the sexual harassment occurs.
- **Employee** means (A) a teacher, substitute teacher, school administrator, school superintendent, guidance counselor, school counselor, psychologist, social worker, nurse, physician, school paraprofessional or coach employed by the Board or working in a public elementary, middle or high school; or (B) any other individual who, in the performance of the individual's duties, has regular contact with students and who provides services to or on behalf of students enrolled in a public elementary, middle or high school, pursuant to a contract with the Board.
- **Formal complaint** means a document filed by a complainant or signed by the Title IX Coordinator alleging sexual harassment (as defined under Title IX) against a respondent and requesting that the Administration investigate the allegation of sexual harassment. A "document filed by a complainant" means a document or electronic submission that contains the complainant's physical or digital signature, or otherwise indicates that the complainant is the person filing the formal complaint.
- **Respondent** means an individual who has been alleged to be the perpetrator of conduct that could constitute sexual harassment.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment In The Workplace**

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **A. Definitions (continued)**

- **School days** means the days that school is in session as designated on the calendar posted on the Board's website. In its discretion, and when equitably applied and with proper notice to the parties, the District may consider business days during the summer recess as "school days" if such designation facilitates the prompt resolution of the grievance process.
- **Supportive measures** mean non-disciplinary, non-punitive individualized services offered as appropriate, as reasonably available, and without fee or charge to the complainant or the respondent before or after the filing of a formal complaint or where no formal complaint has been filed. Such measures are designed to restore or preserve equal access to the District's education program or activity without unreasonably burdening the other party, including measures designed to protect the safety of all parties or the District's educational environment, or deter sexual harassment. Supportive measures may include counseling, extensions of deadlines or other course-related adjustments, modifications of work or class schedules, mutual restrictions on contact between the parties, increased security and monitoring, and other similar measures.

###### **B. Reporting Sexual Harassment**

1. It is the express policy of the Board to encourage victims of sexual harassment to report such claims. Any person may report sexual harassment (whether or not the person reporting is the person alleged to be the victim of conduct that could constitute sexual harassment), in person, by mail, by telephone, or by electronic mail, using the contact information listed for the Title IX Coordinator. If the District receives notice of sexual harassment or alleged sexual harassment against a person in the District's education program or activity, the Title IX Coordinator will promptly contact the complainant to discuss the availability of supportive measures, whether or not the complainant files a formal complaint, and will consider the complainant's wishes with respect to such measures. If the complainant has yet to file a formal complaint, the Title IX Coordinator will explain to the complainant the process for doing so.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace**

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **B. Reporting Sexual Harassment (continued)**

2. The District will treat complainants and respondents equitably. A respondent is presumed not responsible for the alleged conduct and a determination regarding responsibility will be made at the conclusion of the grievance process if a formal complaint is filed. Nothing in these Administrative Regulations shall preclude the District from placing an employee respondent on administrative leave during the pendency of the grievance process. Further, nothing in these Administrative Regulations shall limit or preclude the District from removing a respondent from the District's education program or activity on an emergency basis, provided that the District undertakes an individualized safety and risk analysis, and determines that an immediate threat to the physical health or safety of any student or other individual arising from the allegations of sexual harassment justifies removal. If a respondent is removed on an emergency basis, the District shall provide the respondent with notice and an opportunity to challenge the decision immediately following the removal.

###### **C. Formal Complaint and Grievance Process**

1. A formal complaint may be filed with the Title IX Coordinator in person, by mail, or by electronic mail, by using the contact information listed for the Title IX Coordinator. At the time of filing a formal complaint, a complainant must be participating in or attempting to participate in the District's education programs or activity. A formal complaint may be signed by the Title IX Coordinator. If the formal complaint being filed is against the Title IX Coordinator, the formal complaint should be filed with the Superintendent. If the formal complaint being filed is against the Superintendent, the formal complaint should be filed with the Board Chair, who will then retain an independent investigator to investigate the matter.
2. The District may consolidate formal complaints as to allegations of sexual harassment against more than one respondent, or by more than one complainant against one or more respondents, or by one party against the other party, where the allegations of sexual harassment arise out of the same facts or circumstances. If possible, formal complaints should be filed within ten (10) school days of the alleged occurrence in order to facilitate the prompt and equitable resolution of such claims.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace**

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **C. Formal Complaint and Grievance Process (continued)**

2. (continued) The District will attempt to complete the formal grievance process within ninety (90) school days of receiving a formal complaint. This timeframe may be temporarily delayed or extended in accordance with Subsection G of this Section.
3. Upon receipt of a formal complaint, if the Title IX Coordinator has not already discussed the availability of supportive measures with the complainant, the Title IX Coordinator will promptly contact the complainant to discuss the availability of such measures and consider the complainant's wishes with respect to them. The Title IX Coordinator or designee may also contact the respondent, separately from the complainant, to discuss the availability of supportive measures for the respondent. The District will maintain as confidential any supportive measures provided to the complainant or respondent, to the extent that maintaining such confidentiality would not impair the ability of the District to provide such supportive measures.
4. Within ten (10) school days of receiving a formal complaint, the District will provide the known parties with written notice of the allegations potentially constituting sexual harassment under Title IX and a copy of this grievance process. The written notice must also include the following:
  - i. The identities of the parties involved in the incident, if known;
  - ii. The conduct allegedly constituting sexual harassment as defined above;
  - iii. The date and the location of the alleged incident, if known;
  - iv. statement that the respondent is presumed not responsible for the alleged conduct and that a determination regarding responsibility is made at the conclusion of the grievance process;
  - v. A statement that the parties may have an advisor of their choice, who may be, but is not required to be, an attorney, and may inspect and review evidence; and
  - vi. A statement of any provision in the District's policies that prohibits knowingly making false statements or knowingly submitting false information during the grievance process.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace**

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **C. Formal Complaint and Grievance Process (continued)**

4. (continued) If, in the course of an investigation, the District decides to investigate allegations about the complainant or respondent that are not included in the written notice, the District must provide notice of the additional allegations to the parties whose identities are known.
5. The parties may have an advisor of their choice accompany them during any grievance proceeding at which the party's attendance is required. The District may, in its discretion, establish certain restrictions regarding the extent to which an advisor may participate in the proceedings. If any such restrictions are established, they will be applied equally to all parties.
6. The Title IX Coordinator will, as applicable, promptly commence an investigation of the formal complaint, designate a school administrator to promptly investigate the formal complaint, or dismiss the formal complaint in accordance with Subsection F of this Section. The standard of evidence to be used to determine responsibility is the preponderance of the evidence standard (i.e., more likely than not). The burden of proof and the burden of gathering evidence sufficient to reach a determination regarding responsibility rest on the District and not on the parties.
7. The parties will be given an equal opportunity to discuss the allegations under investigation with the investigator(s) and are permitted to gather and present relevant evidence. This opportunity includes presenting witnesses, including fact and expert witnesses, and other inculpatory and exculpatory evidence. Credibility determinations will not be based on a person's status as a complainant, respondent, or witness. The District will provide to a party whose participation is invited or expected (including a witness) written notice of the date, time, location, participants, and purpose of all hearings (if applicable), investigative interviews, or other meetings, with sufficient time for the party to prepare to participate.
8. Both parties will be given an equal opportunity to inspect and review any evidence obtained as part of the investigation that is directly related to the allegations raised in the formal complaint, including the evidence upon which the District does not intend to rely in reaching a determination regarding responsibility and inculpatory or exculpatory evidence whether obtained from a party or other source, so that each party can meaningfully respond to the evidence prior to the conclusion of the investigation.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace**

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **C. Formal Complaint and Grievance Process (continued)**

- 8.(cont) Prior to completion of the investigative report, the District will send to each party and the party's advisor, if any, the evidence subject to inspection and review in an electronic format or a hard copy, and the parties will have ten (10) school days to submit a written response, which the investigator(s) will consider prior to completion of the investigative report, as described in Paragraph 9 of this Subsection.
9. The investigator(s) will create an investigative report that fairly summarizes relevant evidence. The investigator(s) will send the investigative report, in an electronic format or hard copy, to each party and to each party's advisor for their review and written response at least ten (10) school days prior to the time a determination regarding responsibility is made.
10. The Superintendent will appoint a decision-maker(s), who shall be a District employee or third-party contractor and who shall be someone other than the Title IX Coordinator or investigator(s). If the formal complaint filed is against the Superintendent, the Board Chair shall appoint the decision-maker, who shall be someone other than the Title IX Coordinator or investigator(s). The investigator(s) and the decision-maker(s) shall not discuss the investigation's facts and/or determination while the formal complaint is pending. The decision-maker(s) will afford each party the opportunity to submit written, relevant questions that a party wants asked of any party or witness, provide each party with the answers, and allow for additional, limited follow-up questions from each party. Questions and evidence about the complainant's sexual predisposition or prior sexual behavior are not relevant, unless such questions and evidence about the complainant's prior sexual behavior are offered to prove that someone other than the respondent committed the conduct alleged by the complainant, or if the questions and evidence concern specific incidents of the complainant's prior sexual behavior with respect to the respondent and are offered to prove consent. The decision-maker(s) will explain to the party proposing the questions any decisions to exclude a question as not relevant.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace**

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **C. Formal Complaint and Grievance Process (continued)**

11. The decision-maker(s) will issue a written determination regarding responsibility. To reach this determination, the decision-maker must apply the preponderance of the evidence standard. The written determination will include: (1) identification of the allegations potentially constituting sexual harassment; (2) a description of the procedural steps taken from the receipt of the formal complaint through the determination, including any notifications to the parties, interviews with parties and witnesses, site visits, methods used to gather other evidence, and hearings held; (3) findings of fact supporting the determination; (4) conclusions regarding the application of the District's code of conduct to the facts; (5) a statement of, and rationale for, the result as to each allegation, including a determination regarding responsibility, any disciplinary sanctions the District will impose on the respondent, and whether remedies designed to restore or preserve equal access to the District's education program or activity will be provided by the District to the complainant; and (6) the District's procedures and permissible bases for the complainant and respondent to appeal. If the respondent is found responsible for violating the Board's Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel), the written determination shall indicate whether the respondent engaged in sexual harassment as defined by the Board's Policy and these Administrative Regulations. The written determination will be provided to both parties simultaneously.
  
12. Student respondents found responsible for violating the Board's Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel) may be subject to discipline up to and including expulsion. Employee respondents found responsible for violating the Board's Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel) may be subject to discipline up to and including termination of employment. Other respondents may be subject to exclusion from the District's programs, activities and/or property. In appropriate circumstances, the District may make a criminal referral. Remedies will be designed to restore or preserve equal access to the District's education programs or activities.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace** (continued)

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **C. Formal Complaint and Grievance Process** (continued)

13. After receiving notification of the decision-maker(s)' decision, or after receiving notification that the District dismissed a formal complaint or any allegation therein, both complainant and respondent may avail themselves of the appeal process set forth in Section E of this Section.

###### **D. Informal Resolution**

At any time prior to reaching a determination regarding responsibility, but only after the filing of a formal complaint, the District may suggest to the parties the possibility of facilitating an informal resolution process, such as mediation, to resolve the formal complaint without the need for a full investigation and adjudication. If it is determined that an informal resolution may be appropriate, the Title IX Coordinator or designee will consult with the parties.

Prior to facilitating an informal resolution to a formal complaint, the Title IX Coordinator or designee will provide the parties with written notice disclosing the sexual harassment allegations, the requirements of an informal resolution process, and any consequences from participating in the informal resolution process. Upon receipt of this document, complainants and respondents have five (5) school days to determine whether they consent to participation in the informal resolution. The District must obtain voluntary, written consent to the informal resolution process from both parties.

Prior to agreeing to any resolution, any party has the right to withdraw from the informal resolution process and resume the grievance process with respect to the formal complaint. If a satisfactory resolution is reached through this informal process, the matter will be considered resolved. If these efforts are unsuccessful, the formal grievance process will continue.

Nothing in this section precludes an employee from filing a complaint of retaliation for matters related to an informal resolution, nor does it preclude either party from filing complaints based on conduct that is alleged to occur following the District's facilitation of the informal resolution.

An informal resolution is not permitted to resolve allegations that an employee sexually harassed a student.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace (continued)**

#### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

##### **E. Appeal Process**

After receiving notification of the decision-maker(s)' decision, or after receiving notification that the District dismissed a formal complaint or any allegation therein, both complainant and respondent have five (5) school days to submit a formal letter of appeal to the Title IX Coordinator specifying the grounds upon which the appeal is based. Upon receipt of an appeal, the Superintendent shall appoint a decision-maker(s) for the appeal, who shall be someone other than the Title IX Coordinator, investigator(s) or initial decision-maker(s).

Appeals will be appropriate only in the following circumstances:

- new evidence that was not reasonably available at the time the determination regarding responsibility or dismissal was made, that could affect the outcome of the matter;
- procedural irregularity that affected the outcome of the matter;
- the Title IX Coordinator, investigator(s), and/or decision-maker(s) had a conflict of interest or bias for or against complainants or respondents generally or the individual complainant or respondent that affected the outcome of the matter. A conflict of interest or bias does not exist solely because the Title IX Coordinator, investigators(s), and/or decision-maker(s) previously worked with or disciplined the complainant or respondent.

The District will provide the other party with written notice of such appeal. The appealing party will then have ten (10) school days to submit to the decision-maker(s) for the appeal a written statement in support of, or challenging, the outcome of the grievance process. The decision-maker(s) for the appeal will provide the appealing party's written statement to the other party. The other party will then have ten (10) school days to submit to the decision-maker for the appeal a written statement in support of, or challenging, the outcome of the grievance process. The decision-maker(s) for the appeal, in their discretion, will determine any additional necessary and appropriate procedures for the appeal.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace** (continued)

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

###### **E. Appeal Process** (continued)

After considering the parties' written statements, the decision-maker(s) for the appeal will provide a written decision. The decision-maker(s) for the appeal will attempt to issue the written decision within thirty (30) school days of receipt of all written statements from the parties. If it is found that one of the bases for appeal exists, the decision-maker(s) for the appeal will issue an appropriate remedy.

Supportive measures for either or both parties may be continued throughout the appeal process.

###### **F. Dismissal of a Formal Complaint**

The Title IX Coordinator shall dismiss any formal complaint that, under Title IX, 1) would not constitute sexual harassment as defined under Title IX even if proved, 2) did not occur in the District's education program or activity, or 3) did not occur against a person in the United States. Such dismissal does not preclude action under another Board policy.

The District may dismiss a formal complaint or any allegations therein, if at any time during the investigation or hearing a complainant notifies the Title IX Coordinator in writing that 1) the complainant would like to withdraw the formal complaint or any allegations therein; 2) the respondent is no longer enrolled or employed in the District; or 3) specific circumstances prevent the District from gathering evidence sufficient to reach a determination as to the formal complaint or allegations therein.

Upon a dismissal, the District will promptly and simultaneously send written notice of the dismissal and reason(s) therefor to each party. Either party can appeal from the District's dismissal of a formal complaint or any allegations therein using the appeals procedure.

In the event a formal complaint is dismissed prior to the issuance of a decision under Title IX, the Title IX Coordinator shall determine if the allegations of sexual harassment shall proceed through the grievance procedures identified in Section II of these Administrative Regulations for claims of sex discrimination for consideration as to whether the allegations constitute sexual harassment under Title VII or Connecticut law.

A dismissal pursuant to this section does not preclude action by the District under the Student Discipline policy, Code of Conduct for students/or and employees, or any other applicable rule, policy, and/or collective bargaining agreement.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace**

##### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX** (continued)

###### **G. Miscellaneous**

1. Any timeframe set forth in these Administrative Regulations may be temporarily delayed or extended for good cause. Good cause may include, but is not limited to, considerations such as the absence or illness of a party, a party's advisor, or a witness; concurrent law enforcement activity; concurrent activity by the Department of Children and Families; or the need for language assistance or accommodation of disabilities. If any timeframe is altered on a showing of good cause, written notice will be provided to each party with the reasons for the action.
2. If a sexual harassment complaint raises a concern about discrimination or harassment on the basis of any other legally protected classification (such as race, religion, color, national origin, age, or disability), the Title IX Coordinator or designee shall make a referral to other appropriate personnel within the District (e.g. Section 504 Coordinator, etc.), so as to ensure that any such investigation complies with the requirements of policies regarding non-discrimination.
3. If the sexual harassment complaint results in reasonable cause to suspect or believe that a child has been abused or neglected, has had a non-accidental physical injury, or injury which is at variance with the history given of such injury, is placed at imminent risk of serious harm, or that a student has been sexually assaulted by a school employee, then, the person to whom the complaint is given or who receives such information shall report such matters in accordance with the Board's policy on the Reports of Suspected Child Abuse or Neglect of Children.
4. Retaliation against any individual who complains pursuant to the Board's Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel) and these Administrative Regulations is strictly prohibited. Neither the District nor any other person may intimidate, threaten, coerce, or discriminate against any individual for the purpose of interfering with any right or privilege secured by Title IX or these Administrative Regulations, or because the individual has made a report or complaint, testified, assisted, or participated or refused to participate in any manner in an investigation, proceeding, or hearing under these Administrative Regulations. The District will take actions designed to prevent retaliation. Complaints alleging retaliation may be filed according to the grievance procedures for sex discrimination described herein.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace (continued)**

#### **Section I. Grievance Process for Complaints of Sexual Harassment Under Title IX**

##### **G. Miscellaneous (continued)**

5. The District will maintain for a period of seven (7) years records of:
  - i. Each sexual harassment investigation including any determination regarding responsibility, any disciplinary sanctions imposed on the respondent, and any remedies provided to the complainant designed to restore or preserve equal access to the Board's education program or activity;
  - ii. Any appeal and the result therefrom;
  - iii. Any informal resolution and the result therefrom; and
  - iv. All material used to train Title IX Coordinators, investigators, decision-makers, and any person who facilitates an informal resolution process. The Board will make these training materials publicly available on its website.

If the District has actual knowledge of sexual harassment in an education program or activity of the Board, and for any report or formal complaint of sexual harassment, the District will create and maintain for a period of seven (7) years, records of any actions, including any supportive measures, taken in response to a report or formal complaint of sexual harassment. The District will document the basis for its conclusion that its response was not deliberately indifferent, and document that it has taken measures designed to restore or preserve equal access to the Board's education program or activity. If the District does not provide a complainant with supportive measures, then the District will document the reasons why such a response was not clearly unreasonable in light of the known circumstances.

#### **Section II. Grievance Procedures for Claims of Sex Discrimination (Other Than Sexual Harassment Under Title IX)**

##### **A. Definitions**

- **Complainant** means an individual who is alleged to be the victim of conduct that could constitute sex discrimination.
- **Respondent** means an individual who has been reported to be the perpetrator of conduct that could constitute sex discrimination.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace**

#### **Section II. Grievance Procedures for Claims of Sex Discrimination (Other Than Sexual Harassment Under Title IX) (continued)**

##### **B. Reporting Sex Discrimination Other than Sexual Harassment under Title IX**

It is the express policy of the Board to encourage victims of sex discrimination to report such claims. Any person may report sex discrimination (whether or not the person reporting is the person alleged to be the victim of conduct that could constitute sex discrimination), in person, by mail, by telephone, or by electronic mail, using the contact information listed for the Title IX Coordinator. If the District receives notice of sex discrimination or alleged sex discrimination against a person in the District's education program or activity, the Title IX Coordinator or designee will promptly notify the complainant of the grievance process. The District will treat complainants and respondents equitably during the grievance process. Sexual harassment is a form of sex discrimination, and any incident of sexual harassment under Title IX, as defined above, shall be handled pursuant to Section I of these Administrative Regulations. Any allegations of sexual harassment under Title VII or Connecticut law, as defined above, shall be handled pursuant to this Section II of these Administrative Regulations.

##### **C. Grievance Procedures**

1. As soon as an employee feels that the employee has been subjected to sex discrimination other than sexual harassment as defined under Title IX (including, without limitation, sexual harassment under Title VII or Connecticut law), the employee should make a written complaint to the Title IX Coordinator or to the building principal, or designee. The employee will be provided a copy of the Board's Policy and Administrative Regulations and made aware of the employee's rights under this Policy and Administrative Regulations. Preferably, complaints should be filed within ten (10) school days of the alleged occurrence. Timely reporting of complaints facilitates the investigation and resolution of such complaints.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace (continued)**

#### **Section II. Grievance Procedures for Claims of Sex Discrimination (Other Than Sexual Harassment Under Title IX)**

##### **C. Grievance Procedures (continued)**

2. The complaint should state the:
  - i. Name of the complainant;
  - ii. Date of the complaint;
  - iii. Date(s) of the alleged discrimination;
  - iv. Name(s) of the discriminator(s);
  - v. Location where such discrimination occurred;
  - vi. Names of any witness(es) to the discrimination;
  - vii. Detailed statement of the circumstances constituting the alleged discrimination; and
  - viii. Remedy requested.
3. Any employee who makes an oral complaint of sex discrimination to any of the above-mentioned personnel will be provided a copy of these Administrative Regulations and will be requested to make a written complaint pursuant to the above procedure.
4. All complaints are to be forwarded immediately to the building principal or designee unless that individual is the subject of the complaint, in which case the complaint should be forwarded directly to the Superintendent of Schools or designee. In addition, a copy of any complaint filed under this Policy shall be forwarded to the Title IX Coordinator. If the complaint being filed is against the Title IX Coordinator, the complaint should be filed with the Superintendent. If the complaint being filed is against the Superintendent, the complaint should be filed with the Board Chair, who will then retain an independent investigator to investigate the matter.
5. The Title IX Coordinator or designee shall investigate all complaints of sex discrimination against an employee, regardless of whether the conduct occurred on or off-school grounds. Complaints will be investigated promptly within the timeframes identified below. Timeframes may be extended as needed given the complexity of the investigation, availability of individuals with relevant information, and other extenuating circumstances. The investigation shall be conducted discreetly, maintaining confidentiality insofar as possible while still conducting an effective and thorough investigation.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace (continued)**

#### **Section II. Grievance Procedures for Claims of Sex Discrimination (Other Than Sexual Harassment Under Title IX)**

##### **C. Grievance Procedures (continued)**

6. Any employee who makes a complaint shall be notified of the District's intent to investigate the complaint. In the event the employee requests confidentiality or that an investigation not be conducted, the District will take reasonable steps to investigate and respond to the complaint to the extent possible, given the request for confidentiality or that the District not investigate the complaint. If the employee insists that this information not be shared with the alleged discriminator(s), the employee will be informed that the District's ability to investigate and/or take corrective action may be limited.
7. Upon receipt of a sex discrimination complaint, the Title IX Coordinator shall either promptly commence an investigation of the complaint, or shall designate a school administrator to promptly investigate the complaint. The Title IX Coordinator or designee shall:
  - i. offer to meet with the complainant and respondent (if applicable) separately within ten (10) school days to discuss the nature of the complaint, identify individuals the complainant and respondent (if applicable) believe have relevant information, and obtain any relevant documents the complainant and respondent may have;
  - ii. provide the complainant and respondent (if applicable) with a copy of the Board's sex discrimination policy and accompanying regulations;
  - iii. consider whether any interim measures may be appropriate to protect the complainant or respondent (if applicable), pending the outcome of the investigation;
  - iv. conduct an investigation that is adequate, reliable, and impartial. Investigate the factual basis of the complaint, including, as applicable, conducting interviews with individuals deemed relevant to the complaint;

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace (continued)**

#### **Section II. Grievance Procedures for Claims of Sex Discrimination (Other Than Sexual Harassment Under Title IX)**

##### **C. Grievance Procedures (continued)**

- v. consider whether alleged sex discrimination has created a hostile work environment, including consideration of the effects of off-campus conduct on the school;
  - vi. communicate the outcome of the investigation in writing to the complainant, to the respondent, and to any individual properly identified as a party to the complaint (to the extent permitted by state and federal confidentiality requirements), within ninety (90) school days from the date the complaint was received by the Superintendent's office. The investigator may extend this deadline for no more than fifteen (15) additional school days if needed to complete the investigation. The complainant and respondent (if applicable) shall be notified of such extension. The written notice shall include a finding whether the complaint was substantiated and if so, shall identify, to the extent possible, how the District will remedy the discrimination, adhering to the requirements of state and federal law; and
  - vii. when sex discrimination has been found, take steps that are reasonably calculated to end the discrimination, take corrective and/or disciplinary action aimed at preventing the recurrence of the discrimination, as deemed appropriate by the Superintendent or designee, and take steps to remedy the effects of the sex discrimination.
8. If a complaint is made during summer recess, the complaint will be reviewed and addressed as quickly as possible given the availability of staff and/or other individuals who may have information relevant to the complaint. If fixed timeframes cannot be met, the complainant and respondent will receive notice and interim measures may be implemented as necessary.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace (continued)**

#### **Section II. Grievance Procedures for Claims of Sex Discrimination (Other Than Sexual Harassment Under Title IX)**

##### **C. Grievance Procedures (continued)**

9. If the complainant or respondent (if applicable) is dissatisfied with the findings of the investigation, the complainant or respondent may file a written appeal within five (5) school days to the Title IX Coordinator, or, if the Title IX Coordinator conducted the investigation, to the Superintendent of Schools. The Title IX Coordinator or Superintendent shall review the Title IX Coordinator or designee's written report, the information collected by the Title IX Coordinator or designee together with the recommended disposition of the complaint to determine whether the alleged conduct constitutes sex discrimination. The Title IX Coordinator or Superintendent of Schools may determine if further action and/or investigation is warranted. After completing this review, the Title IX Coordinator or Superintendent of Schools shall respond to the complainant and respondent (if applicable), in writing, within fifteen (15) school days following the receipt of the written request for review.

##### **D. Miscellaneous**

1. If a sex discrimination complaint raises a concern about discrimination or harassment on the basis of any other legally protected classification (such as race, religion, color, national origin, age, or disability), the Title IX Coordinator or designee shall make a referral to other appropriate personnel within the District (e.g. Section 504 Coordinator, etc.), so as to ensure that any such investigation complies with the requirements of policies regarding nondiscrimination.
2. If the sex discrimination complaint results in reasonable cause to suspect or believe that a child has been abused or neglected, has had a nonaccidental physical injury, or injury which is at variance with the history given of such injury, is placed at imminent risk of serious harm, or that a student has been sexually assaulted by a school employee, then, the person to whom the complaint is given or who receives such information shall report such matters in accordance with the Board's policy on the Reports of Suspected Child Abuse or Neglect of Children.

## **Students/Personnel -- Certified/Non-Certified**

### **Sexual Harassment/Title IX**

#### **Prohibition of Sex Discrimination and Sexual Harassment in the Workplace (continued)**

#### **Section II. Grievance Procedures for Claims of Sex Discrimination (Other Than Sexual Harassment Under Title IX)**

##### **D. Miscellaneous (continued)**

3. Retaliation against any individual who complains pursuant to the Board's Policy regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel) and these Administrative Regulations is strictly prohibited. Neither the District nor any other person may intimidate, threaten, coerce, or discriminate against any individual for the purpose of interfering with any right or privilege secured by Title IX or these Administrative Regulations, or because the individual has made a report or complaint, testified, assisted, or participated or refused to participate in any manner in an investigation, proceeding, or hearing under these Administrative Regulations. The District will take actions designed to prevent retaliation as a result of filing a complaint. Complaints alleging retaliation may be filed according to the grievance procedures for sex discrimination described herein.

#### **Section III. Further Reporting**

At any time, a complainant alleging sex discrimination or sexual harassment may also file a complaint with the Office for Civil Rights, Boston Office, U.S. Department of Education, 8<sup>th</sup> Floor, 5 Post Office Square, Boston, MA 02109-3921 (Telephone (617) 289-0111).

Employees may also make a report of sexual harassment and/or sex discrimination to the Connecticut Commission on Human Rights and Opportunities, 450 Columbus Boulevard, Hartford, CT 06103-1835 (Telephone: 860-541-3400 or Connecticut Toll Free Number: 1-800-477-5737).

Copies of these Administrative Regulations will be distributed to all employees.

**Sexual Assault:** An offense classified as forcible or nonforcible sex offense under the uniform crime reporting system of the Federal Bureau of Investigation.

**Rape— (Except Statutory Rape)** The carnal knowledge of a person, without the consent of the victim, including instances where the victim is incapable of giving consent because of the person's age or because of the person's temporary or permanent mental or physical incapacity.

**Sodomy**—Oral or anal sexual intercourse with another person, without the consent of the victim, including instances where the victim is incapable of giving consent because of the person's age or because of the person's temporary or permanent mental or physical incapacity.

**Sexual Assault with an Object**—To use an object or instrument to unlawfully penetrate, however slightly, the genital or anal opening of the body of another person, without the consent of the victim, including instances where the victim is incapable of giving consent because of the person's age or because of the person's temporary or permanent mental or physical incapacity.

**Fondling**—The touching of the private body parts of another person for the purpose of sexual gratification without the consent of the victim, including instances where the victim is incapable of giving consent because of the person's age or because of the person's temporary or permanent mental or physical incapacity.

**Incest**—Non-forcible sexual intercourse between persons who are related to each other within the degrees wherein marriage is prohibited by law.

**Statutory Rape**—Non-forcible sexual intercourse with a person who is under the statutory age of consent.

**Dating Violence:** Violence committed by a person who is or has been in a social relationship of a romantic or intimate nature with the victim; and where the existence of such a relationship shall be determined based on a consideration of the length of the relationship, the type of relationship, and the frequency of interaction between the persons involved in the relationship.

**Domestic Violence:** Includes felony or misdemeanor crimes of violence committed by a current or former spouse or intimate partner of the victim, by a person with whom the victim shares a child in common, by a person who is cohabitating with or has cohabitated with the victim as a spouse or intimate partner, by a person similarly situated to a spouse of the victim under the domestic or family violence laws of the jurisdiction receiving grant monies, or by any other person against an adult or youth victim who is protected from that person's acts under the domestic or family violence laws of the jurisdiction.

**Stalking:** Engaging in a course of conduct directed at a specific person that would cause a reasonable person to fear for the person's safety or the safety of others; or suffer substantial emotional distress.

**COMPLAINT FORM REGARDING SEXUAL HARASSMENT UNDER TITLE IX  
(PERSONNEL)**

*This complaint form should be used for complaints of sexual harassment as defined on page 1 of the Board's Administrative Regulations regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel)*

Name of the complainant \_\_\_\_\_

Date of the complaint \_\_\_\_\_

Date of the alleged sexual harassment \_\_\_\_\_

Name or names of the sexual harasser(s) \_\_\_\_\_

\_\_\_\_\_

Location where such sexual harassment occurred \_\_\_\_\_

\_\_\_\_\_

Name(s) of any witness(es) to the sexual harassment \_\_\_\_\_

\_\_\_\_\_

Detailed statement of the circumstances constituting the alleged sexual harassment

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Remedy requested \_\_\_\_\_

Signature of Complainant or Title IX Coordinator: \_\_\_\_\_

**COMPLAINT FORM REGARDING SEX DISCRIMINATION (OTHER THAN SEXUAL HARASSMENT UNDER TITLE IX) (PERSONNEL)**

*This complaint form should be used for complaints of sex discrimination as defined on page 1 of the Board's Administrative Regulations regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel)*

Name of the complainant \_\_\_\_\_

Date of the complaint \_\_\_\_\_

Date of the alleged sex discrimination \_\_\_\_\_

Name or names of the sex discriminator(s) \_\_\_\_\_

\_\_\_\_\_

Location where such sex discrimination occurred \_\_\_\_\_

\_\_\_\_\_

Name(s) of any witness(es) to the sex discrimination \_\_\_\_\_

\_\_\_\_\_

Detailed statement of the circumstances constituting the alleged sex discrimination

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Remedy requested \_\_\_\_\_

Signature: \_\_\_\_\_

**NOTICE OF SEXUAL HARASSMENT ALLEGATIONS UNDER TITLE IX**

In accordance with the Board’s Policy and Administrative Regulations regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel), a formal complaint of sexual harassment has been filed with the Title IX Coordinator.

Identities of the parties involved, if known:

\_\_\_\_\_ (Complainant(s))  
\_\_\_\_\_ (Respondent(s))

The conduct allegedly constituting sexual harassment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The date and the location of the alleged incident, if known: \_\_\_\_\_  
\_\_\_\_\_

The Title IX Coordinator or designee will contact the parties regarding the next step in the grievance process. Questions can be directed to the Title IX Coordinator: **[INSERT CONTACT INFORMATION FOR TITLE IX COORDINATOR]**

The respondent is presumed not responsible for the alleged conduct. A determination regarding responsibility is made at the conclusion of the grievance process.

All parties involved may have an advisor of their choice who may be, but it not required to be, an attorney. This advisor may inspect and review evidence as permitted by the Board’s Administrative Regulations regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel).

Any employee who knowingly makes false statements or knowingly submits false information during this grievance process is subject to discipline, up to and including termination. Additionally, it is a violation of the Board’s Student Discipline Policy to lie to school officials or otherwise engage in dishonest behavior, which includes knowingly making false statements or knowingly submitting false information during the grievance process. Any student who knowingly makes false statements or knowingly submits false information during this grievance process will be subject to sanctions pursuant to the Board’s Student Discipline Policy.

**A copy of the Board’s Policy and Administrative Regulations regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel) is included with this notice.**

**NOTICE OF INFORMAL RESOLUTION PROCESS FOR SEXUAL HARASSMENT  
COMPLAINTS UNDER TITLE IX**

In accordance with the Board's Policy and Administrative Regulations regarding the Prohibition of Sex Discrimination and Sexual Harassment (Personnel), a formal complaint of sexual harassment has been filed with the Title IX Coordinator. The Board has an informal resolution process to promptly and equitably resolve such complaints using mediation [*alternatively, could be restorative justice*]. This informal resolution process will only be utilized if both the Complainant and Respondent agree to do so.

The conduct allegedly constituting sexual harassment: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

If both parties agree to the informal resolution process, it shall preclude the parties from resuming a formal complaint arising out of the same allegations. However, either party may withdraw from the informal resolution process at any time before agreeing to a resolution and resume the grievance process for formal complaints of sexual harassment.

If both parties agree to a resolution, that resolution is binding upon both parties and cannot be changed or appealed.

The District will maintain for a period of seven (7) years records of the informal resolution process and results therefrom.

\_\_\_\_\_

I voluntarily consent to the informal resolution process:

\_\_\_\_\_

Complainant

\_\_\_\_\_

Date

\_\_\_\_\_

Respondent

\_\_\_\_\_

Date

**[To be posted in a conspicuous place readily available  
for viewing by employees and emailed to employees within three months of hire with the  
subject line "Sexual Harassment Policy" or words of similar import]**

**SEXUAL HARASSMENT IS ILLEGAL**

**AND IS PROHIBITED**

**BY**

**THE CONNECTICUT DISCRIMINATION EMPLOYMENT PRACTICES ACT**

**(Section 46a-60(a)(8) of the Connecticut General Statutes)**

**AND**

**TITLE VII OF THE CIVIL RIGHTS ACT OF 1964**

**(42 United States Code Section 2000e et seq.)**

**SEXUAL HARASSMENT MEANS ANY UNWELCOME SEXUAL ADVANCES OR REQUESTS FOR SEXUAL FAVORS OR ANY CONDUCT OF A SEXUAL NATURE WHEN:**

- 1. SUBMISSION TO SUCH CONDUCT IS MADE EITHER EXPLICITLY OR IMPLICITLY A TERM OR CONDITION OF AN INDIVIDUAL'S EMPLOYMENT;**
- 2. SUBMISSION TO OR REJECTION OF SUCH CONDUCT BY AN INDIVIDUAL IS USED AS THE BASIS FOR EMPLOYMENT DECISIONS AFFECTING SUCH INDIVIDUAL; OR**
- 3. such conduct has the purpose or effect of substantially interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment.**

**EXAMPLES OF SEXUAL HARASSMENT INCLUDE:**

**UNWELCOME SEXUAL ADVANCES**

**SUGGESTIVE OR LEWD REMARKS**

**UNWANTED HUGS, TOUCHES, KISSES**

**REQUESTS FOR SEXUAL FAVORS**

**RETALIATION FOR COMPLAINING ABOUT SEXUAL HARASSMENT**

**DEROGATORY OR PORNOGRAPHIC POSTERS, CARTOONS, OR DRAWINGS.**

**REMEDIES FOR SEXUAL HARASSMENT MAY INCLUDE:**

**CEASE AND DESIST ORDERS**

**BACK PAY**

**COMPENSATORY DAMAGES**

**PUNITIVE DAMAGES**

**HIRING, PROMOTION, OR REINSTATEMENT**

**Retaliation against any employee for complaining about sexual harassment is prohibited under this policy and illegal.**

VIOLATION OF THIS POLICY IS GROUNDS FOR DISCIPLINE, INCLUDING DISCHARGE.

INDIVIDUALS WHO ENGAGE IN ACTS OF SEXUAL HARASSMENT MAY ALSO BE SUBJECT TO CIVIL AND CRIMINAL PENALTIES.

AN INFRACTION OF THIS POLICY BY SUPERVISORS OR CO-WORKERS SHOULD BE REPORTED IMMEDIATELY TO THE TITLE IX COORDINATOR **OR THE SUPERINTENDENT IF THE TITLE IX COORDINATOR IS THE SUBJECT OF THE COMPLAINT**. CONFIDENTIALITY WILL BE MAINTAINED TO THE EXTENT POSSIBLE.

ANY EMPLOYEE WHO BELIEVES THAT HE OR SHE HAS BEEN HARASSED OR DISCRIMINATED AGAINST IN THE WORKPLACE IN VIOLATION OF THIS POLICY MAY ALSO CONTACT:

THE CONNECTICUT COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES  
[ \_\_\_\_\_ ] REGION OFFICE [REGIONAL OFFICES AND THEIR ADDRESSES CAN BE FOUND  
ON THE CHRO WEBSITE, [HTTP://WWW.STATE.CT.US/CHRO/](http://www.state.ct.us/chro/)]  
[ADDRESS]  
[PHONE NUMBER]

AND/ OR:

THE EQUAL EMPLOYMENT OPPORTUNITY COMMISSION  
BOSTON AREA OFFICE  
JOHN F. KENNEDY FEDERAL BUILDING  
475 GOVERNMENT CENTER  
BOSTON, MA 02203  
PHONE (800) 669-4000

CONNECTICUT LAW REQUIRES THAT A FORMAL WRITTEN COMPLAINT BE FILED WITH THE COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES WITHIN THREE HUNDRED (300) DAYS OF THE DATE WHEN THE ALLEGED HARASSMENT/ DISCRIMINATION OCCURRED.

9/24/20

*A mandated policy on preschool special education.*

## **Instruction**

### **Special Education**

#### **Preschool Special Education**

The Board of Education (Board) recognizes the value of special education and its responsibility in ensuring that all resident preschool children with disabilities have the opportunity to participate in special programs and services from which they may benefit. The Board shall maintain an early intervention program for preschool-aged children identified through the “Birth to Age Three” screening process under regulations imposed by the Individuals with Disabilities Act (IDEA) which identifies children with special education needs or developmental delays.

The District’s program shall be based upon the “reverse mainstreaming model” which maintains a significant number of non-disabled (regular education) students who serve as role models for the students with identified special needs. The Director/Supervisor of Special Education is responsible to coordinate and evaluate the program annually in order to make recommendation to the Superintendent of Schools or his/her designee.

The Board authorizes the Superintendent of Schools to establish administrative practices and procedures to carry out this responsibility. Such administrative practices and procedures shall include:

1. Locating and identifying all preschool children, between the ages of three and five, with disabilities pursuant to the relevant provisions of the Individuals with Disabilities Act (IDEA). The register of children eligible to receive preschool special education services is to be maintained and revised annually by the Director/Supervisor of Special Education;
2. Ensuring that the parents of preschool age children with disabilities have received and understand the request for consent for evaluation of their child;
3. Developing an individualized education program (IEP) for each preschool age child with a disability requiring services;
4. Appointing and training appropriately qualified personnel;
5. Providing transportation to students enrolled in the program;
6. Maintaining lists as required by the State Education Department pertaining to the number of children with disabilities who are being served, as well as those identified disabled students not served; and
7. Reporting as required to the State Education Department; and
8. Ensuring the smooth transition from infant to preschool programs.

## **Instruction**

### **Special Education**

#### **Preschool Special Education** (continued)

The Planning and Placement Team's responsibilities will include the evaluation and recommendation for placement in appropriate approved programs and the provision of appropriate special education programs and services for each preschool child with a disability. Children recommended for an educational program may enter at various points throughout the school year.

It is ultimately the responsibility of the Board to provide the appropriate approved preschool program and services for the District children. Should the PPT's determination and recommendations differ from parent or guardian preference, placement may be appealed by a parent or guardian through the procedures outlined in IDEA.

If the PPT determines that a child is ineligible for participation in a preschool special education program, a screening for developmental and social-emotional delays using validated assessment tools, such as the Ages and Stages Questionnaire and the Ages and Stages Social-Emotional Questionnaire, or their equivalents, shall take place for such child. The Board directs the Superintendent or his/her designee to ensure that the District considers that adequate and appropriate space and personnel are made available for such programs and services.

### **Tuition**

Non-disabled (regular education) students enrolled in the "reverse mainstreaming" preschool program will be required to pay tuition for the program. Identified students or students who qualify for free or reduced lunch will not be charged for tuition. The Board will annually establish the tuition rate for the following school year. The Board, through the Superintendent or his/her designee, will establish a monthly payment plan. Failure to make such tuition payment may result in discontinuation of enrollment in the program.

Legal Reference:      Connecticut General Statutes  
                                 1076a Definitions.  
                                 1076b State supervision of special education programs and services.  
                                 1076c Receipt and use of money and personal property.  
                                 1076d Duties and powers of boards of education to provide special  
                                 education programs and services. (as amended by PA 97-114)  
                                 1076e School construction grant for cooperative regional special education  
                                 facilities.  
                                 1076f Definition of terms used in formula for state aid for special  
                                 education.

1076g State aid for special education.

## **Instruction**

### **Special Education**

Legal Reference: Connecticut General Statutes (continued)

1076h Special education hearing and review procedure. Mediation of disputes.

1076i Advisory council for special education.

1076j Fiveyear plan for special education.

1076k Development of experimental educational programs.  
State Board of Education Regulations.

1076m Auditing claims for special education assistance.

1076a1 et seq. Definitions.

1076b1 through 1076b4 Supervision and administration.

1076d1 through 1076d19 Conditions of instruction.

1076h1 through 1076h2 Due process.

1076l1 Program Evaluation.

10145a24 through 10145a31 Special Education (re teacher certification).

17a-248e Individualized family service plans. Duties of lead agencies (as amended by PA 21-46, Section 27)

34 C.F.R. 3000 Assistance to States for Education for Handicapped Children.

American with Disabilities Act, 42 U.S.C. §12101 et seq.

Individuals with Disabilities Education Act, 20 U.S.C. §1400 et seq. as amended by P.L. 105-17.

Rehabilitation Act of 1973, Section 504, 29 U.S.C. §794.