Student Achievement Committee Meeting

Wednesday, May 21, 2025 6:30 PM
BOE Auditorium and via Zoom Meeting Platform, 129 Church Street, Bristol, CT 06010

1.	**Call to Order/ Pledge of Allegiance**	
2.	**Decision: Approval of Minutes**	
3.	**Public Comment**	
4.	**Decision**	
4.1.	Algebra I Academic	**Presenter:** Laura Lanza
4.2.	Introduction to CWE	**Presenter:** Laura Lanza
4.3.	Construction Technology	**Presenter:** Laura Lanza
4.4.	Law and Justice	**Presenter:** Leszek Ward
4.5.	AP Psychology	**Presenter:** Leszek Ward
4.6.	Grade 3-5 Math	**Presenter:** Jillian Romann
5.	**Adjournment**	

Student Achievement & Outcomes Committee
April 30, 2025
MINUTES - DRAFT

The minutes presented within this document are a summary of the discussion that took place at the Student Achievement Committee meeting. To view the meeting in its entirety and hear full reports please go to: April 30, 2025 SAC Meeting Recording

PRESENT Committee members: Jill Fitzsimons-Bula & Kristen Giantonio
ABSENT: Maria Simmons

ALSO PRESENT: Kenneth Bagley, Carly Fortin, Sara Hale (Zoom), Mary Hawk, Laura Lanza, Chair Shelby Pons (Zoom), Azra Redzic, Melanie Vetrano (Zoom), Leszek Ward

Call to Order
Commissioner Fitzsimons-Bula called the meeting to order at 6:30 p.m.

Decision: Approval of Minutes from February 19, 2025 meeting
On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to approve the February 19, 2025 meeting minutes.

Public Comment: No public comment.

Information: School Calendar Discussion
Chief Academic Officer, Carly Fortin brought forward the information on school calendars from previous Student Achievement Committee dates. Discussion followed regarding the current "no-school" days within the calendar. There was also discussion that the calendar should be brought to Student Achievement Committee meetings before the full Board of Education meetings.

Decision: PLTW Principles of Engineering
Mrs. Laura Lanza, Supervisor of Secondary STEM, presented Principles of Engineering, a second-level PLTW course for high schoolers, which explores diverse engineering fields and careers through real-world problem-solving. Students develop technical skills using various engineering tools and apply the design process to areas like mechanical, robotics, and environmental engineering. The course uses activity-, project-, problem-based learning to cultivate essential skills such as problem-solving, collaboration, and ethical reasoning, alongside engineering protocols like design and testing.

On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to move the PLTW Principles of Engineering curriculum revision to the full Board of Education for approval.

Decision: PLTW Introduction to Engineering and Design

Mrs. Lanza presented Introduction to Engineering Design (IED), a PLTW course, which introduces high school students to engineering tools and a problem-solving design process. Through activity-, project-, problem-based learning, students advance from structured tasks to open-ended challenges, developing planning, documentation, communication, and professional skills. Individually and collaboratively, they apply systems thinking to consider factors like material selection and sustainability, develop technical representation skills using CAD software, and create 3D-printed prototypes. Students use testing protocols and computational methods to inform iterative design improvements and build competency in project management, peer review, and environmental impact analysis.

Questions followed.

On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to move the PLTW Introduction to Engineering and Design curriculum revision to the full Board of Education for approval.

Decision: ECE Chemistry

Mrs. Lanza presented the curriculum for ECE Chemistry. This curriculum was written to formalize the difference between AP Chemistry and ECE Chemistry. This course allows students to earn 8 college credits through the University of Connecticut.

Questions and discussion followed.

On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to move the ECE Chemistry curriculum revision to the full Board of Education for approval.

Decision: Cooperative Work Experience 50/100

Mrs. Lanza presented the curriculum revision for CWE 50/100. In this course, students 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.

Questions and discussion followed.

On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to move the CWE 50/100 curriculum revision to the full Board of Education for approval.

Decision: Tools and Materials

Mrs. Lanza presented the curriculum revision for Tools and Materials. 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.

Questions and discussion followed.

On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to move the Tools and Materials curriculum revision to the full Board of Education for approval.

Decision: Kindergarten Literacy

Mrs. Azra Redzic, Supervisor of Elementary Humanities, presented that the reason for this revision is to align with Connecticut's approved K-3 reading curriculum models or programs, increase ease of use of Wit & Wisdom for classroom teachers and update resources/ books. The new curriculum includes 4 Modules: 1. The Five Senses, 2. Once Upon a Farm, 3. America, Then and Now, and 4. The Continents.

Questions and discussion followed.

On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to move the Kindergarten Literacy curriculum revision to the full Board of Education for approval.

Decision: Kindergarten Music

Mr. Kenneth Bagley, Supervisor of Fine Arts, presented the curriculum revision for Kindergarten music. This course was last revised in 2014 and now includes the following 7 units: 1. Rhythm, 2. Melody, 3. Expression, 4. Form, 5. Timbre, 6. Literacy, and 7. Technique.

On a motion made by Commissioner Fitzsimons-Bula and seconded by Commissioner Giantonio, it was unanimously;
VOTED: to move the Kindergarten Music curriculum revision to the full Board of Education for approval.

There being no further discussion, Commissioner Fitzsimons-Bula adjourned the meeting at 7:37pm.

Respectfully submitted,
Katlyne Laprise
Katlyne Laprise

PROCEDURES FOR REMOTE PUBLIC COMMENT

Members of the public are invited to comment to the Board on any topic related to school business.

Items requiring consideration by the Board must be approved as an agenda item by a 2/3ds vote of the Board members present. Such items may be referred for further study and not necessarily acted upon at this meeting.

Anyone wishing to address the Board should adhere to the following procedures:

PUBLIC COMMENT

Before a Remote Meeting

1. Send your comments to: KatlyneLaprise@bristolk12.org
2. Be sure to put **PUBLIC COMMENT-SAC** in the subject line.
3. Include your name and address.
4. Direct your comments to the Board Chair.
5. Your comments will be read at the meeting by the Board Chair.
6. All comments should be written in an appropriate manner, particularly if concerning a personnel matter.
7. Any comments not adhering to the guidelines will not be read at the meeting.

During a Remote Meeting

1. Everyone is requested to address the Chair for recognition.
2. Each speaker must state his/her name and address.
3. All speakers must observe rules of common etiquette. Personalities are not to be injected. Anyone violating this rule will be denied the floor. Unless waived by the Chairperson or a majority of the Board,
4. Each speaker shall limit his/her remarks to three (3) minutes.
5. A speaker will not be recognized for a second time on the same topic.
6. Each speaker must concern himself/herself with the topic under discussion. Anyone digressing from the topic will be ruled out of order.
7. Written statements and materials may be made available, in advance of comments, for distribution to Board members.
8. Speakers shall state their positions on the subject being discussed.
9. Board members will not respond directly to comments during the Board meeting. The Superintendent will direct the question to the appropriate staff member for follow-up.

Bristol Public Schools

Bristol, Connecticut

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Algebra 1 (Academic)	Math	Gr. 9-10	1.0 (Full Year)

Course Description:

This Algebra 1 course develops students' understanding of algebraic relationships, progressing systematically from linear through exponential and quadratic functions. Beginning with linear equations and systems, students learn to create, graph, and solve equations in both one and two variables. They then extend these concepts to inequalities and systems of inequalities, learning to represent and interpret constraints in context. Throughout these initial units, students also analyze bivariate data and develop linear models, connecting algebraic representations to real-world situations.

The middle portion of the course formalizes students' understanding of functions as mathematical relationships. Students learn to use function notation, analyze key features of graphs, and interpret different representations of functions. This foundation enables them to explore exponential functions, where they contrast exponential and linear growth, apply properties of exponents, and model real-world growth and decay scenarios. The course concludes with an introduction to quadratic functions, where students analyze different forms of quadratic expressions, graph parabolas, and interpret key features in context.

Throughout the six units, students engage in mathematical practices that develop their ability to problem-solve, model real-world situations, and construct mathematical arguments. The course emphasizes multiple representations of relationships (graphs, equations, tables, and verbal descriptions) and the connections between them. Key standards addressed include creating equations (A.CED.A.1-3), interpreting functions (F.IF.A.1-2, F.IF.B.4), analyzing different types of functions (F.LE.A.1-2), and working with expressions (A.SSE.A.1).

Aligned Core Resources:	Connection to the ***BPS Vision of the Graduate***
https://accessim.org/hs?a=teacher IM360 Changes	Problem Solving • IM's focus on real-world modeling and problem-solving strategies • Multiple solution pathways are encouraged and explored • Students develop perseverance through challenging tasks Critical Thinking • Students analyze mathematical relationships and justify their reasoning • Regular opportunities to critique others' reasoning • Emphasis on understanding "why" not just "how" Communication and Collaboration • Structured mathematical discourse is built into lessons • Students explain their thinking both verbally and in writing • Many activities involve partner and group work

Additional Course Information: ***Knowledge/Skill Dependent courses/prerequisites***	**Link to *Completed Equity Audit***
The following skills are foundational for success in IM Algebra 1. These skills are developed in grades 6-8 and form the foundation for algebraic thinking and problem-solving in IM Algebra 1. Properties of Operations • Apply order of operations with rational numbers • Use distributive property to expand and factor expressions • Understand and apply integer exponents Linear Relationships • Recognize proportional relationships from tables, graphs, and equations • Understand slope as a rate of change • Graph points in the coordinate plane Variable Expressions • Evaluate expressions by substituting values for variables • Combine like terms and simplify basic algebraic expressions One-Step and Two-Step Equations • Solve equations using inverse operations • Check solutions by substitution Number Sense • Work fluently with fractions, decimals, and percentages • Understand rational and irrational numbers Data Analysis	Equity Curriculum Review - Algebra 1 ACA (2025)

- Create and interpret basic data displays
- Calculate measures of center (mean, median)

Standard Matrix

Standard	Lesson(s)																		
HSA-APR.A	U6 L8	U6 L9																	
HSA-CED.A.1	U3 L3	U4 L13																	
HSA-CED.A.2	U1 L1	U1 L2	U1 L3	U1 L5	U1 L6	U5 L3	U5 L4	U5 L5	U5 L6	U5 L7									
HSA-CED.A.3	U1 L1	U1 L2	U1 L3	U1 L5	U1 L9	U1 L10	U1 L12	U1 L17	U3 L1	U3 L3	U3 L5	U3 L6	U3 L7	U3 L9					
HSA-CED.A.4	U1 L8	U1 L9	U1 L10	U1 L11	U4 L16														
HSA-REI.A	U1 L4	U1 L7	U1 L12																
HSA-REI.A.1	U1 L6	U1 L7	U4 L5																
HSA-REI.B.3	U1 L4	U1 L8	U1 L9	U3 L2	U3 L3														
HSA-REI.C	U1 L18	U1 L19																	
HSA-REI.C.5	U1 L16																		
HSA-REI.C.6	U1 L12	U1 L13	U1 L14	U1 L15	U1 L16	U1 L17	U1 L18												
HSA-REI.D.10	U1 L5	U1 L10	U1 L11	U3 L5															
HSA-REI.D.11	U4 L9																		
HSA-REI.D.12	U3 L4	U3 L5	U3 L6	U3 L7	U3 L8	U3 L9													
HSA-SSE.A	U5 L9	U5 L17	U6 L8	U6 L11															
HSA-SSE.A.1	U1 L6	U5 L5	U5 L7	U5 L17	U6 L2	U6 L3													
HSA-SSE.A.1.b	U5 L18																		
HSA-SSE.A.2	U6 L8	U6 L9																	
HSA-SSE.B.3	U6 L2	U6 L8	U6 L9	U6 L10	U6 L13														
HSA-SSE.B.3.c	U5 L18																		
HSF-BF.A.1	U4 L14	U4 L17	U4 L18	U5 L11	U5 L15	U6 L6													
HSF-BF.A.1.a	U4 L4	U4 L14	U5 L2	U5 L3	U5 L5	U5 L15	U5 L16	U5 L17	U6 L1	U6 L2	U6 L3	U6 L4	U6 L5	U6 L6	U6 L7				
HSF-BF.A.1.b	U1	U1	U1	U1															

	L2	L14	L15	L16															
HSF-BF.B.3	U4 L14	U6 L12	U6 L13	U6 L15	U6 L17														
HSF-BF.B.4	U4 L15	U4 L16	U4 L17																
HSF-BF.B.4.a	U4 L17																		
HSF-IF.A.1	U4 L1	U4 L2	U4 L4																
HSF-IF.A.2	U4 L2	U4 L3	U4 L4	U4 L5	U4 L12	U4 L17	U5 L8	U5 L9	U5 L11	U5 L17	U5 L18	U5 L19	U6 L3	U6 L5	U6 L14				
HSF-IF.A.3	U6 L2																		
HSF-IF.B	U4 L10	U5 L8																	
HSF-IF.B.4	U4 L1	U4 L2	U4 L3	U4 L4	U4 L5	U4 L6	U4 L8	U4 L9	U4 L11	U4 L17	U5 L1	U5 L2	U5 L4	U5 L6	U5 L11	U5 L12	U5 L13	U5 L19	U6 L14
HSF-IF.B.5	U4 L10	U4 L11	U4 L12	U5 L8	U5 L9	U5 L11	U5 L19	U6 L6	U6 L7										
HSF-IF.B.6	U4 L7	U4 L8	U4 L9	U4 L18	U5 L10	U5 L15													
HSF-IF.C	U4 L4	U4 L12	U4 L13	U4 L14	U6 L4	U6 L6	U6 L12	U6 L15	U6 L16	U6 L17									
HSF-IF.C.7	U4 L12	U5 L8	U6 L12	U6 L13															
HSF-IF.C.7.a	U1 L10	U6 L6	U6 L7	U6 L11	U6 L13	U6 L14	U6 L15	U6 L16	U6 L17										
HSF-IF.C.7.b	U4 L12	U4 L13	U4 L14																
HSF-IF.C.7.e	U5 L9	U5 L15																	
HSF-IF.C.8	U5 L18	U6 L14																	
HSF-IF.C.9	U5 L2	U5 L6	U5 L12	U6 L14															
HSF-LE.A.1	U5 L11	U5 L19	U5 L21																
HSF-LE.A.1.a	U5 L20																		
HSF-LE.A.1.b	U5 L20	U5 L21																	
HSF-LE.A.1.c	U5 L11	U5 L21																	
HSF-LE.A.2	U5 L8	U5 L9	U5 L11	U5 L13	U5 L15	U5 L19	U5 L20	U5 L21	U6 L12										
HSF-LE.A.3	U5 L1	U5 L19	U6 L4																
HSF-LE.B.5	U5 L3	U5 L4	U5 L5	U5 L11	U5 L12	U5 L13													
HSN-Q.A.1	U5	U5	U5																

	L7	L8	L11																
HSN-Q.A.2	U1 L1	U3 L9	U5 L17																
HSN-Q.A.3	U2 L6	U5 L11	U5 L21																
HSS-ID.B.5	U2 L1	U2 L2	U2 L3																
HSS-ID.B.6	U2 L4	U2 L7	U2 L8	U2 L9	U2 L10														
HSS-ID.B.6.a	U2 L4	U2 L6	U2 L8	U4 L17	U4 L18	U5 L11	U5 L21												
HSS-ID.B.6.b	U2 L6																		
HSS-ID.B.6.c	U2 L5	U2 L6	U4 L17	U4 L18															
HSS-ID.C.7	U2 L4	U2 L5	U2 L8	U2 L10															
HSS-ID.C.8	U2 L7	U2 L8	U2 L10																
HSS-ID.C.9	U2 L9	U2 L10																	

Unit Links

Unit 1: Linear Equations and Systems (iM Unit 2)
Unit 2: Two-Variable Statistics (iM Unit 3)
Unit 3: Linear Inequalities and Systems (iM Unit 4)
Unit 4: Functions (iM Unit 5)
Unit 5: Introduction to Exponential Functions (iM Unit 6)
Unit 6: Introduction to Quadratic Functions (iM Unit 7)

Unit Title:				
Unit 1: Linear Equations and Systems (iM Unit 2)				
Relevant Standards: Bold indicates priority				
HSA-CED.A.2 HSA-CED.A.3 HSA-CED.A.4	HSA-REI.A HSA-REI.A.1 HSA-REI.B.3 HSA-REI.C HSA-REI.C.5 HSA-REI.C.6 HSA-REI.D.10	HSF-BF.A.1.b	HSF-IF.C.7.a	HSN-Q.A.2

Essential Question(s):	**Enduring Understanding(s):**
• How can we create equations to represent real-world situations? • How do the properties of equality and inequality help us solve and justify solutions to equations? • What does it mean for an equation or system to have one, infinite, or no solutions? • How can the structure of an algebraic expression help us simplify and interpret it? • What are the advantages of solving systems of equations graphically versus algebraically? • How do the properties of numbers influence how we analyze and solve equations? • What is a solution and how can we find them? • What does it mean for two equations or systems to be equivalent?	• Mathematical models help us represent and analyze real-world situations. • The structure of an equation or expression provides insight into its meaning and solution. • Solving equations and systems of equations requires an understanding of equality and reasoning. • The number and type of solutions to an equation or system provide important information about relationships. • Using precise reasoning and mathematical properties ensures valid conclusions. • A solution is a set of values that satisfies an equation or system, and various methods—such as substitution, elimination, or graphing—help us uncover these values. • Transforming equations into other equivalent equations can help to find solutions or isolate a particular variable. • Graphs are visualizations of the solution set to an equation or system of equations.
Demonstration of Learning:	**Pacing for Unit**
Section A Checkpoint Section B Checkpoint Section C Checkpoint End-of-Unit Assessment	iM v.360 Pacing and Vertical Content Alignment (gr. 6-11)
Family Overview (link below)	**Integration of Technology:**
https://accessim.org/9-12-aga/algebra-1/unit-2?a=family	
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
constraint, model, equivalent equations, solution to a system of equations, system of equations, substitution, elimination, equivalent systems	
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Science (Physics & Biology) • Speed & Acceleration: Writing and solving equations to analyze motion, such as car speeds or running distances. • Population Growth: Using exponential functions to model bacteria growth or human population changes. Health & PE • Exercise & Heart Rate Zones: Using inequalities to determine safe heart rate ranges during workouts. • Calories & Nutrition: Writing equations to analyze food	• Students struggle to correctly define variables and set up equations from word problems. • Students assume every equation has a single solution and do not recognize no-solution or infinite-solution cases. • Students believe expressions can be solved like equations, failing to differentiate between simplifying and solving. • Students do not recognize parallel lines as systems with no solution or identical lines as having infinitely

intake and energy burned. Business & Financial Literacy • Loan & Interest Calculations: Using exponential equations to model credit card interest and loan payments. Computer Science • Coding Basics: Using algebraic expressions in simple coding projects (e.g., game design or automation).	many solutions. • Students view the equal sign procedurally rather than as a statement of equivalence between two expressions. • Students often fail to realize they have solved for a variable if they do not get a numerical answer.
Connections to Prior Units:	**Connections to Future Units:**
The 8th-grade math curriculum lays the foundation for Algebra 1 by introducing students to linear equations, functions, systems of equations, inequalities, and exponents.	Connection to Unit 2: Two-Variable Statistics • Linear equations from Unit 1 become the basis for linear regression models • Understanding slope and y-intercept helps students interpret correlation and line of best fit • Graphing linear equations prepares students to analyze scatter plots and residuals Connection to Unit 3: Linear Inequalities and Systems • Methods for solving equations extend to solving inequalities • Understanding solution sets of equations prepares students for solution regions of inequalities • System solving strategies adapt to systems of inequalities Connection to Unit 4: Functions • Linear equations serve as the first and simplest example of functions • Input-output relationships in equations become function notation • Graphing skills extend to analyzing key features of all functions Connection to Unit 5: Exponential Functions • Linear growth (constant rate) contrasts with exponential growth (constant ratio) • Understanding rate of change helps distinguish linear vs. exponential relationships • Equation solving strategies adapt to exponential equations Connection to Unit 6: Quadratic Functions • Linear terms appear within quadratic expressions • Understanding how to rewrite linear expressions helps with factoring quadratics • Graphing skills extend to parabolas, with linear functions as a simpler case
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**

Engagement
• Notice and Wonder
• Think-Pair-Share
Representation
• Presents concepts through graphs, tables, and equations
• Connects visual and symbolic representations
• Supports pattern recognition across forms
Action and Expression
• Which One Doesn't Belong?
• Group Problem Solving
  • Offers choice in solution methods
  • Provides opportunities for different forms of expression
  • Supports executive function through structured collaboration
Specific Unit 1 Applications
• Planning a Party (Lesson 1): Multiple entry points for modeling with equations	

- Writing Equations (Lessons 2-3): Various representations of relationships
- Connecting Equations to Graphs (Lessons 10-11): Visual and algebraic approaches
- Solving Systems (Lessons 13-16): Multiple solution methods offered

Supporting Multilingual/English Learners

The Illustrative Mathematics curriculum incorporates eight Mathematical Language Routines (MLRs) that support English Language Learners:

* MLR1: *Stronger and Clearer Each Time* - Students revise and refine their mathematical language through multiple drafts
MLR2: *Collect and Display* - Students capture and organize language in visual displays
* MLR3: *Clarify, Critique, Correct* - Students analyze mathematical writing/talk
MLR4: *Information Gap* - Students share information to solve problems
MLR5: *Co-Craft Questions* - Students create and improve questions
* MLR6: *Three Reads* - Students analyze complex mathematical text
MLR7: *Compare and Connect* - Students connect different mathematical representations
* MLR8: *Discussion Supports* - Students participate in mathematical discussions

MLR1: Stronger and Clearer Each Time
Used in "Writing Equations to Model Relationships" lessons: Students revise and refine their mathematical explanations of relationships and patterns
Key Activity: Students describe patterns in tables and refine their explanations through discussion

MLR3: Clarify, Critique, Correct
Featured in "Planning a Party" lesson: Students analyze constraints and equations
Key Activity: Evaluating assumptions and mathematical models

MLR6: Three Reads
Implemented in word problems throughout the unit: Helps students break down complex modeling situations
Key Activity: Reading word problems multiple times with different focuses (context, quantities, relationships)

MLR8: Discussion Supports
Used in lessons like "Writing Equations to Model Relationships": Supports mathematical discourse about patterns and relationships
Key Activity: Structured discussions about generalizing patterns from tables

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

A MLL can . . . determine the meaning of words and phrases in oral presentations and literary and informational text.
Learning Target: I can represent real-world constraints with systems of equations and use substitution and elimination to find equivalent systems and their solutions.

- **Level 1:** I can recognize simple equations and pictures that show how real-world limits work.
- **Level 2:** I can match keywords and symbols to parts of simple systems of equations that model everyday problems, with support.
- **Level 3:** I can create basic systems of equations from real-world examples and use guided steps with substitution or elimination to find solutions.
- **Level 4:** I can model real-world constraints by writing systems of equations and use substitution and elimination to solve for equivalent systems and their solutions, explaining my steps.
- **Level 5:** I can independently represent real-world constraints as systems of equations and use substitution and elimination to derive equivalent systems and determine their solutions, clearly explaining my reasoning.

Lesson Sequence	**Learning Target**	**Success Criteria/Assessment**
Section A Writing and Modeling with Equations Lesson 1-5	• I can interpret solutions to equations in one variable and in two variables. • I can recognize that the graph of a linear equation in two variables represents all pairs of values that are solutions to the equation. • I can write equations with numbers and variables to describe relationships and constraints.	Lessons 1-2: • I can explain the meaning of the term “constraints.” • I can tell which quantities in a situation can vary and which ones cannot. Checkpoint A Question 1 **EOU Problem 4** **NOTES: EOU Problem 4** Consider changing to a different scenario. Idea: Although you can buy an “8in” pizza, the cost structure is not “per inch” in real pizza shops. Option 1: Their experience buying pizza is sm, med, lg. Change the verbage to sm, med, lg Option 2: Change the scenario to something where the cost structure is per inch

		Note: IM may be including the number 8 to see if students use that value in their calculations. We can still include extra, irrelevant numerical information in the new scenario. • I can use letters and numbers to write Checkpoint A Question 1 • expressions representing the quantities in a situation. Lesson 3: • I can use words and equations to describe the patterns I see in a table of values or in a set of calculations. • When given a description of a situation, I can use representations like diagrams and tables to help make sense of the situation and write equations for it. Lesson 4: • I can explain what it means for a value or pair of values to be a solution to an equation. • I can find solutions to equations by reasoning about a situation or by using algebra. Lesson 5: • I can use graphing technology to graph linear equations and identify solutions to the equations. • I can explain how the coordinates of the points on the graph of a linear equation are related to the equation. • When given the graph of a linear equation, I can explain the meaning of the points on the graph in terms of the situation it represents. Checkpoint A Question 2
Section B: Manipulating Equations and Understanding Their Structure Lessons 8-11	• I can determine the slope and vertical intercept of the graphs of linear equations by making use of structure or by rearranging the equations. • I can rearrange multi-variable equations to highlight a particular quantity. • I can recognize that "equivalent equations" are equations that have exactly the same solutions, and that multiple equivalent equations can represent the same relationship.	Lesson 6: • I can tell whether two expressions are equivalent and explain why or why not. Checkpoint B Question 1 **EOU Problem 1** **NOTES: EOU Problem 1** Many students are unable to demonstrate that they understand legal moves because they are unable to deal with fractions. *Idea:* Would prefer a similar question with simpler equations so students can show they know what equivalent equations mean. Compare with Checkpoint B problem 1. We could leave this question on the EOU and make it worth 0 points so we can see if students make progress towards mastery of it, and eventually make its way back on the assessment, with an eye on making sure the test does not get too long • I know and can identify the moves that can be made to transform an equation into an equivalent one. • I can explain what it means for two equations to be equivalent, and how equivalent equations can be used to describe the same situation in different ways. Lesson 7:

		• I can explain why some algebraic moves create equivalent equations but some do not. • I know how equivalent equations are related to the steps of solving equations. • I know what it means for an equation to have no solutions and can recognize such an equation. Lesson 8: • Given an equation, I can solve for a particular variable (like height, time, or length) when the equation would be more useful in that form. Checkpoint B Question 2 EOU Problem 2 • I know the meaning of the phrase "to solve for a variable." Lesson 9: • I can write an equation to describe a situation that involves multiple quantities whose values are not known, and then solve the equation for a particular variable. Checkpoint B Question 2 EOU Problem 2 • I know how solving for a variable can be used to quickly calculate the values of that variable. Lesson 10: • I can describe the connections between an equation of the form ax + by = c, the features of its graph, and the rate of change in the situation. Checkpoint B Question 2 **EOU Problem 3** **NOTES: EOU Problem 3** For options 'c' and 'd" This concept of "If we increase x by a then we must decrease y by b" does not correspond to any activity in the unit. The closest is lesson 10 activity 2 in which slope is discussed as the change in y when x changes by 1, but this is not the same. *Idea:* This could be resolved by inserting extra practice problems or an activity about the change in y value for changes in x value greater than 1 in Lesson 10. • I can graph a linear equation of the form ax + by = c • I explain how rewriting the equation for a line in different forms can make it easier to find certain kinds of information about the relationship and about the graph. Lesson 11: • I can find the slope and vertical intercept of a line with equation ax + by = c Checkpoint B Question 2 • I can take an equation of the form ax + by = c and rearrange it into the equivalent form y = mx + b • I can use a variety of strategies to find the slope and vertical intercept of the graph of a linear equation given in different forms.
Section C: Systems of Linear Equations in	• I can determine whether a system of equations will have 0, 1, or infinitely many solutions by analyzing their structure or by graphing.	Lesson 12: • I can explain what we mean by "the solution to a system of linear equations" and can explain how the solution is represented graphically.

Two Variables Lessons 12-17	• I can use elimination or substitution to create one or more equivalent systems to help solve the original system.	• I can explain what we mean when we refer to two equations as a system of equations. • I can use tables and graphs to solve systems of equations. **EOU Problem 5** **NOTES: EOU Problem 5** The success criterion is recognizing that the solution is the intersection, but this question assumes fluency in graphing lines in multiple forms with mixed fractions, which is not possible to do anyway on Edulastic. *Idea:* (1) Allow graphing calculator on EOU (2) Need to change the equations so that the intercepts and the solution are all whole numbers. This would also make it graphable on Pear Assessment, allowing us to track student understanding year over year. For example, this system has the same complexity and is graphable on edulastic. $y = -\frac{1}{2}x + 9$ $5x - 4y = 20$ Sol: (8, 2) Lesson 13: • I can solve systems of equations by substituting a variable or an expression. • I know more than one way to perform substitution and can decide which way or what to substitute based on how the given equations are written. EOU Problem 6 **NOTES: EOU Problem 6** A student who has mastered elimination and substitution but has not mastered rearranging an equation first will not be able to demonstrate their learning and would receive no credit. *Idea:* (1) Separate into two questions, one where they need to rearrange (just rearrange, not solve) and then a second question where they are given one question in y=mx+b form and one in standard form. Lesson 14: • I can solve systems of equations by adding or subtracting them to eliminate a variable. • I know that adding or subtracting equations in a system creates a new equation, where one of the solutions to this equation is the solution to the system. EOU Problem 7 **NOTES: EOU Problem 7** The language is not accessible for many students (in particular ML students and students with special needs). *Idea:* Change the question so that students solve it first (this way they are demonstrating the ability to use both substitution and elimination on the test), keep part A, drop part B Lesson 15:

		• I can explain why adding or subtracting two equations that share a solution results in a new equation that also shares the same solution. EOU Problem 7 Lesson 16: • I can solve systems of equations by multiplying each side of one or both equations by a factor, then adding or subtracting the equations to eliminate a variable. Checkpoint C Problem 1 EOU Problem 6 • I can explain why multiplying each side of an equation by a factor creates an equivalent equation whose graph and solutions are the same as that of the original equation. Lesson 17: • I can tell how many solutions a system has by graphing the equations or by analyzing the parts of the equations and considering how they affect the features of the graphs. Checkpoint C Problem 2 • I know the possibilities for the number of solutions a system of equations could have.
Section D: Lessons 18-19		Lesson 18: • I can get more information about a problem in order to write and solve a system of linear equations. Lesson 19: • I can solve linear equations algebraically. • I can write linear equations to create a pattern.

Unit Title:	
Unit 2: Two-Variable Statistics (iM Unit 3)	
Relevant Standards: Bold indicates priority	
HSN-Q.A.3 HSS-ID.B.5 HSS-ID.C.7 HSS-ID.C.8 HSS-ID.C.9 HSS-ID.B.6 HSS-ID.B.6.a HSS-ID.B.6.b HSS-ID.B.6.c	
Essential Question(s):	**Enduring Understanding(s):**
• How can I summarize and interpret categorical data from two-way frequency tables to identify trends and possible associations between groups? • How do I create a scatter plot for two quantitative variables and describe the type and strength of their relationship? • How can I choose an appropriate function (linear, quadratic, or exponential) to fit a set of data and use that model to solve problems in a real-world context? • How can we use a statistical model to make predictions, and to what extent can we trust those predictions? • What does the slope and intercept of a linear model reveal about the rate of change and starting point in the context of the data? • What does a correlation coefficient say about the relationship between two variables? • What is the relationship between correlation and causation?	• Two-way frequency tables organize data into joint, marginal, and conditional frequencies to reveal patterns and associations between categories. • Scatter plots display the relationship between two quantitative variables, highlighting the type, direction, and strength of their association. • Linear, quadratic, or exponential functions can be selected to model real-world data, enabling predictions and problem-solving in context. • Plotting residuals helps identify how well a chosen function fits the data and exposes any discrepancies or patterns not captured by the model. • The slope represents the rate of change between variables, while the intercept indicates the starting point, both of which are essential for understanding the model's real-world meaning. • The correlation coefficient quantifies the strength and direction of a linear relationship, but it is crucial to remember that correlation does not imply causation.
Demonstration of Learning:	**Pacing for Unit**
Section A Checkpoint Section B Checkpoint *NOTE: Consider adding a question involving finding the line of best fit using technology and making a prediction using the equation.* Section C Checkpoint End-of-Unit Assessment *NOTE: If lesson on residuals is skipped, remove question 1 and question 7 part A from the EOU and skip Checkpoint B part 2.*	iM v.360 Pacing and Vertical Content Alignment (gr. 6-11)
Family Overview (link below)	**Integration of Technology:**
https://accessim.org/9-12-aga/algebra-1/unit-3?a=family	
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
categorical variable, two-way table, variable (statistics), relative frequency table, association, residual, correlation coefficient, negative relationship, positive relationship, strong relationship, weak relationship, causal relationship	
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Social Studies & Civic Engagement • Use two-way tables and relative frequency tables to analyze survey data from community or school elections. Students can	• Many students think all variables are numerical or naturally ordered, not recognizing that categorical (nominal) data simply labels groups.

explore associations between categorical variables (such as voter age groups or political affiliation) and examine the strength of relationships using the correlation coefficient.

Sports Analytics

- Analyze team or player performance data by creating two-way tables that compare categorical variables like player position or team division with performance metrics (e.g., win/loss records, points scored). Students can calculate relative frequencies and use the correlation coefficient to examine relationships.

Technology and Social Media

- Use survey data about social media usage to explore relationships between categorical variables such as preferred platform (Instagram, Twitter, etc.) and usage frequency. Create two-way tables and relative frequency tables to analyze associations and compute correlation coefficients.

- Students can get confused if one table has a total and another does not or may try to apply strategies they learned for totals on a table that does not have totals.
- Students may treat relative frequencies as raw counts instead of proportions or percentages.
- Students may have trouble distinguishing between the observed data and the output predicted by the line of best fit.
- Some believe a coefficient of 0 means no relationship at all, that a high correlation implies causation, or that a negative correlation coefficient represents a weaker correlation than 0.
- Some believe that a higher slope implies a stronger correlation or a higher correlation coefficient.
- A common error is believing that correlation directly implies causation without considering other factors.
- Many students draw lines of best fit to either always start from the origin or always go through the first and last points. They may also believe a line of best fit should go through as many points as possible, even curving the line to achieve this.

Connections to Prior Units:

Two-variable statistics and linear equations are deeply connected because both focus on understanding and modeling relationships between variables. For instance, when you plot paired data on a scatter plot, you often use a linear equation (like $y = mx + b$) to represent the trend in the data. In a line of best fit, slope m and intercept b explain how one variable changes with respect to the other. This connection allows us to predict values and analyze the strength and direction of relationships in real-world data. There is emphasis on interpreting y-intercept and slope in the context of the problem, which students have seen in the previous unit and 8th grade.

Connections to Future Units:

Connection to Unit 3: Linear Inequalities and Systems

- Understanding constraints in data helps interpret inequality boundaries
- Analyzing scatter plots prepares students to visualize feasible regions
- Interpreting points above/below a line extends to understanding solution regions

Connection to Unit 4: Functions

- Correlation and causation discussions prepare for understanding functional relationships
- Analyzing relationships in data sets leads to formal function concepts
- Interpreting key features of scatter plots extends to analyzing function graphs

Connection to Unit 5: Exponential Functions

- Residual analysis helps distinguish linear from exponential patterns
- Understanding "goodness of fit" helps choose appropriate models
- Data analysis skills extend to exploring exponential relationships

Connection to Unit 6: Quadratic Functions

- Pattern recognition in data prepares for identifying quadratic relationships
- Understanding that not all relationships are linear prepares for quadratic modeling
- Analyzing curved patterns in data extends to parabolic relationships

Differentiation through *Universal Design for Learning*

UDL Indicator	**Teacher Actions:**
Engagement	

- Card Sort Activities
- Statistical Investigations
- Data Visualization
- Statistical Language Routines
    - Builds understanding of statistical vocabulary
    - Uses everyday language to explain statistical concepts
    - Provides structured ways to discuss relationships in data

Action and Expression

- Data Analysis Protocols

Specific Unit 2 Applications

- Two-Way Tables (Lessons 1-3): Multiple ways to organize and analyze categorical data
- Linear Models (Lessons 4-6): Visual and numerical approaches to understanding relationships
- Correlation (Lessons 7-8): Various methods to analyze strength of relationships
- Causation (Lesson 9): Multiple contexts for understanding statistical relationships

Supporting Multilingual/English Learners

The Illustrative Mathematics curriculum incorporates eight Mathematical Language Routines (MLRs) that support English Language Learners:

MLR1: *Stronger and Clearer Each Time* - Students revise and refine their mathematical language through multiple drafts
* MLR2: *Collect and Displa*y - Students capture and organize language in visual displays
MLR3: *Clarify, Critique, Correct* - Students analyze mathematical writing/talk
* MLR4: *Information Gap* - Students share information to solve problems
MLR5: *Co-Craft Questions* - Students create and improve questions
MLR6: *Three Reads* - Students analyze complex mathematical text
* MLR7: *Compare and Connect* - Students connect different mathematical representations
* MLR8: *Discussion Supports* - Students participate in mathematical discussions

MLR4: Information Gap

Featured prominently in "Two-Way Tables" lesson: Students share information to complete and interpret tables
Key Activity: Partners work together to complete missing information in two-way tables

MLR2: Collect and Display

Used throughout the unit for organizing statistical data: Students create and interpret different data displays
Key Activity: Converting between frequency tables and relative frequency tables

MLR7: Compare and Connect

Applied when comparing different representations of data: Students connect tables, graphs, and written descriptions
Key Activity: Analyzing associations between variables using different representations

MLR8: Discussion Supports

Implemented in lessons like "Associations in Categorical Data": Structures discussions about statistical relationships
Key Activity: Discussing patterns and relationships in data using precise statistical language

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

A MLL can . . . determine the meaning of words and phrases in oral presentations and literary and informational text.
Learning Target: I can organize data using two-way and relative frequency tables, analyze associations with correlation coefficients, and describe whether relationships are positive, negative, strong, or weak while understanding that correlation does not imply causation.

- **Level 1:** I can recognize and label basic parts of data tables and graphs, such as rows, columns, and simple symbols.
- **Level 2:** I can match keywords like “categorical variable,” “two-way table,” and “relative frequency” with simple examples using visuals and word banks.
- **Level 3:** I can organize data into two-way and relative frequency tables and describe basic associations between variables with support.
- **Level 4:** I can analyze and interpret data by calculating correlation coefficients and explain if relationships are positive, negative, strong, or weak using clear examples.
- **Level 5:** I can independently organize data with two-way and relative frequency tables, analyze associations using correlation coefficients, and distinguish between positive, negative, strong, and weak relationships while understanding that correlation does not imply causation.

Lesson Sequence	**Learning Target**	**Success Criteria/ Assessment**	**Assessment notes**

Section A: Two-Way Tables Lessons 1-3	• I can create relative frequency tables from information given in a two-way table or about a situation. • I can inspect patterns in relative frequency tables and two-way tables to determine if there is a possible association between two variables of interest.	Lesson 1: • I can calculate missing values in a two-way table. • I can create a two-way table for categorical data given information about a situation. • I can describe what the values in a two-way table mean in the context of the situation. Checkpoint A Problem 1 EOU Problem 5 Lesson 2: • I can calculate values in a relative frequency table and describe what the values mean in everyday language. Lesson 3: • I can look for patterns in two-way tables and relative frequency tables to see if there is a possible association between two variables. EOU Problem 6
Section B: Scatter Plots Lessons 4-6	• I can comprehend the connection between residuals, variability, and whether or not using a linear model is appropriate. • I can interpret the rate of change and vertical intercept for a linear model in the context of a situation.	Lesson 4: • I can describe the rate of change and y-intercept for a linear model that represents a situation. Checkpoint B Problem 1 • I can draw a linear model that fits the data well and use the linear model to estimate values I want to find. Lesson 5: • I can describe the rate of change and y-intercept for a linear model that represents a situation. Checkpoint B EOU Problem 3 • I can use technology to find the line of best fit. Lesson 6 (Optional): • I can plot and calculate residuals for a data set and use the information to judge whether a linear model is a good fit.
Section C: Correlation Coefficients Lessons 7-9	• I can describe the strength and sign of the relationship between variables based on the correlation coefficient. • I can investigate the relationship between two variables to analyze whether or not the relationship is causal.	Lesson 7: • I can describe the goodness of fit of a linear model using the correlation coefficient. EOU Problem 2 • I can match the correlation coefficient with a scatter plot and linear model. EOU Problem 2 Lesson 8: • I can describe the strength of a relationship between two variables. Checkpoint C • I can use technology to find the correlation coefficient and explain what the value tells me about a linear model that represents a situation. Lesson 9: • I can look for connections between two variables to analyze whether or not there is a causal relationship EOU Problem 4

Unit Title:		
Unit 3: Linear Inequalities and Systems (iM Unit 4)		
Relevant Standards: Bold indicates priority		
HSA-CED.A.1 HSA-CED.A.3	HSA-REI.B.3 HSA-REI.D.12 HSA-REI.D.10	HSN-Q.A.2

Essential Question(s):	**Enduring Understanding(s):**
• How can I create equations and inequalities to represent real-world situations? • In what ways do the solutions of equations and inequalities help us understand and solve problems in context? • What strategies can I use to solve linear equations and inequalities, including those with lettered coefficients, and how do I choose the best one? • How do I find and represent a solution set?	• Equations and inequalities serve as powerful models that represent real-world situations by translating constraints and relationships into a mathematical language. • Solving equations and inequalities in one variable means finding all values that satisfy the given condition, whether through methods like balancing, substitution, or graphing. • Mathematical solutions must be interpreted in light of the original problem, ensuring that the answer is meaningful and accurately reflects the real-world scenario. • Clear reasoning and communication in creating, solving, and interpreting equations and inequalities form the basis for effective problem solving and informed decision-making in real-world contexts. • Inequalities can be defined by their boundary and the region (relative to the boundary) that contains the solution set. This extends both to solving and to graphing one- and two-variable inequalities. • Solution set of systems of inequalities in two variables is composed of any pair of values that make both inequalities true.
Demonstration of Learning:	**Pacing for Unit**
Section A Checkpoint Section B Checkpoint Section C Checkpoint End-of-Unit Assessment	iM v.360 Pacing and Vertical Content Alignment (gr. 6-11)
Family Overview (link below)	**Integration of Technology:**
https://accessim.org/9-12-aga/algebra-1/unit-4?a=family	
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
solutions to a system of inequalities, system of inequalities	
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Science (Physics) • Students model linear motion by writing an equation for the distance traveled over time using real-world speed and time data. • Apply Newton's Second Law by setting up and solving equations to analyze force, mass, and acceleration in different scenarios. • Phase diagrams in chemistry are systems of linear inequalities. (future grade levels) Social Studies • Students create a monthly budget by writing equations	• Many students believe the direction of the inequality sign (< or >) will always be the same after solving or rearranging the inequality. • Students often misread word problems, overlook key constraints, or choose inappropriate variables, leading to incomplete or incorrect equations. • Students may follow rote steps without understanding inverse operations, causing errors in maintaining equivalence. • Students often expect a single point solution instead

and inequalities for income, expenses, and savings. • Analyze break-even points for small businesses using a system of equations to compare revenue and costs. • Use supply and demand models to explore real-world pricing and economic decision-making. Health & PE • Students track their daily caloric intake and exercise expenditure by writing equations to model energy balance. • Compare different diet plans and workout regimens using a system of equations to determine optimal nutrition. • Create inequalities to determine if a person meets nutritional guidelines while staying within calorie limits.	of a region (often on the intersection of the boundaries), mix up open/closed boundaries, or misinterpret "and" vs. "or," leading to errors in graphing feasible regions. • Some students believe that a number is not a solution to an inclusive inequality if the numbers are not equal. • Many students interpret "at least" to mean "less than" and "at most" to mean "more than" when in fact it is the opposite.
Connections to Prior Units:	**Connections to Future Units:**
The unit builds on concepts from middle school when students write and solve inequalities by reasoning about quantities, particularly in using a number line to solve or represent one-variable inequalities from 8th grade. It further builds on concepts from an earlier unit in which students solve linear equations and systems of equations by writing equivalent equations. The unit assumes fluency in graphing linear equations and systems of linear equations. The unit extends the definition of solutions from unit 2.	Connection to Unit 3: Linear Inequalities and Systems • Understanding constraints in data helps interpret inequality boundaries • Analyzing scatter plots prepares students to visualize feasible regions • Interpreting points above/below a line extends to understanding solution regions Connection to Unit 4: Functions • Correlation and causation discussions prepare for understanding functional relationships • Analyzing relationships in data sets leads to formal function concepts • Interpreting key features of scatter plots extends to analyzing function graphs Connection to Unit 5: Exponential Functions • Residual analysis helps distinguish linear from exponential patterns • Understanding "goodness of fit" helps choose appropriate models • Data analysis skills extend to exploring exponential relationships Connection to Unit 6: Quadratic Functions • Pattern recognition in data prepares for identifying quadratic relationships • Understanding that not all relationships are linear prepares for quadratic modeling • Skill Transfer: extends to parabolic relationships
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**

Engagement
• Context-Rich Problems
• Visual Learning Activities
  • Uses shading and graphing to represent solutions
  • Incorporates physical movement to understand greater than/less than
  • Employs number lines and coordinate planes for visualization
Representation
• Multiple Representations of Inequalities
  • Presents concepts through words, symbols, graphs, and regions
  • Uses number lines and coordinate planes for visualization
  • Connects algebraic and geometric representations
• Inequality Language Routines
  • Builds precise mathematical language for inequalities
  • Connects everyday comparisons to mathematical notation
  • Provides structured ways to describe solution regions
Action and Expression
• Solution Strategy Options	

- Technology Integration
    - Uses graphing technology to explore solutions
    - Supports visualization of solution regions
    - Enables efficient testing of multiple points

Specific Unit 3 Applications

- One-Variable Inequalities (Lessons 1-3)
    - Multiple representations of solution sets
    - Various contexts for constraints
    - Different approaches to testing solutions
- Two-Variable Inequalities (Lessons 4-6)
    - Visual and algebraic approaches to solutions
    - Multiple methods for determining shading
    - Real-world applications of boundaries
- Systems of Inequalities (Lessons 7-9)
    - Various strategies for finding overlap regions
    - Multiple contexts for systems
    - Different approaches to optimization

Supporting Multilingual/English Learners

The Illustrative Mathematics curriculum incorporates eight Mathematical Language Routines (MLRs) that support English Language Learners:

* MLR1: *Stronger and Clearer Each Time* - Students revise and refine their mathematical language through multiple drafts
MLR2: *Collect and Displa*y - Students capture and organize language in visual displays
* MLR3: *Clarify, Critique, Correct* - Students analyze mathematical writing/talk
MLR4: *Information Gap* - Students share information to solve problems
MLR5: *Co-Craft Questions* - Students create and improve questions
* MLR6: *Three Reads* - Students analyze complex mathematical text
MLR7: *Compare and Connect* - Students connect different mathematical representations
MLR8: *Discussion Supports* - Students participate in mathematical discussions

MLR1: Stronger and Clearer Each Time
Used when students refine explanations of solution strategies
Helps students articulate reasoning about inequalities

MLR3: Clarify, Critique, Correct
Applied when analyzing solution methods
Students evaluate different approaches to solving systems

MLR6: Three Reads
Used for word problems involving constraints
Helps break down contextual inequality problems

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

A MLL can . . . determine the meaning of words and phrases in oral presentations and literary and informational text.
Learning Target: I can create, solve, and interpret equations and inequalities using multiple methods, ensuring solutions are meaningful in context and accurately represented graphically.

- **Level 1:** I can use words, symbols, and visuals to show how to set up and solve simple equations and inequalities with support.
- **Level 2:** I can create and solve basic equations and inequalities with models, sentence frames, and guided examples, and explain my answer using key vocabulary.
- **Level 3:** I can write, solve, and graph equations and inequalities using different methods, and explain how my solution relates to the problem with some support.
- **Level 4:** I can create, solve, and interpret equations and inequalities in different forms, explain my reasoning clearly, and connect my solution to real-world situations.
- **Level 5:** I can fluently create, solve, and analyze equations and inequalities using multiple strategies, justify my solutions in written and verbal explanations, and apply them to real-world problems.

Lesson Sequence	**Learning Target**	**Success Criteria/ Assessment**
Section A Linear Inequalities in One Variable Lessons 1-3	• I can use a related equation to solve an inequality in one variable. • I can write and solve inequalities in one variable to represent the constraints in situations and to	Lesson 1: • I can write inequalities that represent the constraints in a situation. Checkpoint A Problem 1 EOU Problem 2

	solve problems. If time allows, Add an activity/lesson on compound inequalities so that students are prepared when they use them in piecewise functions.	Lesson 2: • I can graph the solution to an inequality in one variable. Checkpoint A Problem 1 • I can solve one-variable inequalities and interpret the solutions in terms of the situation. Checkpoint A Problem 2 EOU Problem 1 **NOTE EOU Problem 1** Students get this wrong because they struggle with PEMDAS / inputting values into the calculator when substituting into the inequality EOU Problem 6 • I can explain why the solution to an inequality is a range of values (such as $x > 7$) that makes the inequality true. Lesson 3: • I can analyze the structure of an inequality in one variable to help determine if the solution is greater or less than the solution to the related equation. • I can write and solve inequalities to answer questions about a situation.
Section B: Linear Inequalities in Two Variables Lessons 4-6	• I can understand that a constraint on two variables can be represented by an inequality, a graph (a half-plane), and a verbal description. • I can write inequalities in two variables to represent the constraints in a situation, and use technology to graph the solution set to answer questions about the situation.	Lesson 4: • Given a two-variable inequality and the graph of the related equation, I can determine on which side of the line the solutions to the inequality will fall. • I can describe the graph that represents the solutions to a linear inequality in two variables. Checkpoint B Problem 1 Lesson 5: • Given a two-variable inequality that represents a situation, I can interpret points in the coordinate plane and decide if they are solutions to the inequality. EOU Problem 4 • I can find the solutions to a two-variable inequality by using the graph of a related two-variable equation. EOU Problem 4 Checkpoint B Problem 2 • I can write inequalities to describe the constraints in a situation. Lesson 6: • I can use graphing technology to find the solution to a two-variable inequality. • When given inequalities, graphs, and descriptions that represent the constraints in a situation, I can connect the different representations and interpret them in terms of the situation.
Section C: Systems of Linear Inequalities in Two Variables Lessons 7-9	• I can, given a system of inequalities and their graphs, explain how to tell if a pair of values is a solution to the system. • I can understand that the solution set of a system of inequalities in two variables is composed of any	Lesson 7: • I can write a system of inequalities to describe a situation, find the solution by graphing, and interpret points in the solution. Checkpoint C problem 2 EOU Problem 7 • I know what is meant by "the solutions to a

	pair of values that make both inequalities true, and that it is represented graphically by the region where the graphs overlap.	system of inequalities" and can describe the graphs that represent the solutions. Checkpoint C Problem 1 • When given descriptions and graphs that represent two different constraints, I can find values that satisfy each constraint individually, and values that satisfy both constraints at once. EOU Problem 3 EOU Problem 5 Lesson 8: • I can explain how to tell if a point on the boundary of the graph of the solutions to a system of inequalities is a solution or not. Lesson 9: • I can interpret inequalities and graphs in a mathematical model. • I know how to choose variables, specify the constraints, and write inequalities to create a mathematical model. Checkpoint C Problem 2

Unit Title:	
Unit 4: Functions (iM Unit 5)	
Relevant Standards: Bold indicates priority	
HSA-CED.A.1 HSA-CED.A.4 HSA-REI.A.1 HSA-REI.D.11 HSF-BF.A.1 HSF-BF.A.1a HSF-BF.B.3 HSF-BF.B.4 HSF-BF.B.4a HSF-IF.A.1 HSF-IF.A.2 HSF-IF.B HSF-IF.B.4 HSF-IF.B.6 HSF-IF.C HSF-IF.C.7 HSF-IF.C.7.b HSS.-ID.B.6.a HSS-ID.B.6.c	
Essential Question(s):	**Enduring Understanding(s):**
• How can we use function notation, graphs, and equations to describe relationships between quantities in the real world? • What key features of a graph (like intercepts, maximums, minimums, and intervals of increase or decrease) help us understand the story a function tells? • How do we calculate and interpret the average rate of change of a function, and what does it tell us about the relationship between two quantities? • What makes a relationship a function, and how can we determine if a function has an inverse that is also a function?	• Function Notation, Graphs, and Equations: Function notation, graphs, and equations are powerful tools for describing relationships between quantities, allowing us to model real-world situations and interpret how changes in one quantity affect another. • Key Features of Graphs: The key features of a graph, such as intercepts, maximums, minimums, and intervals of increase or decrease, help us understand the behavior and story a function tells about a real-world situation, revealing how the relationship between variables changes over time or under different conditions. • Average Rate of Change: The average rate of change of a function, represented by the slope over an interval, helps us quantify how one quantity changes in relation to another and provides insight into the strength and direction of their relationship over that interval. • Function Definition and Inverses: A relationship is a function when each input corresponds to exactly one output. Understanding domain and range is essential for determining whether a function has an inverse, and whether that inverse is also a function, which allows us to solve for unknowns in different contexts. • Non-Linear Functions: Not all situations are easily represented by linear equations. Piecewise functions, step functions, and absolute value functions can be useful to represent or model a wider range of situations.
Demonstration of Learning:	**Pacing for Unit**
Checkpoint A Checkpoint B Mid-unit Assessment Checkpoint C Checkpoint D End-of-Unit Assessment	iM v.360 Pacing and Vertical Content Alignment (gr. 6-11)
Family Overview (link below)	**Integration of Technology:**
https://accessim.org/9-12-aga/algebra-1/unit-5?a=family	Desmos Graphing Calculator
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Dependent variable, independent variable, function, function notation, linear function, maximum, minimum, horizontal intercept, vertical intercept, average rate of change, domain, range, piecewise function, absolute	Desmos Classroom Released Activities

value, vertex, inverse function	
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Science (Physical Science, Earth Science) • In physical science, students learn about speed, velocity, and acceleration—concepts that can be modeled with linear functions. Graphing these relationships helps students understand changes over time. • In physical science, students learn about using Kelvin to measure temperature and in math they learn how to use functions and their inverse to convert back and forth from kelvin and celsius. Social Studies • Functions apply to economic trends, such as tracking the relationship between minimum wage and employment rates or supply and demand. • In civics, students could use functions to model changes in voter turnout over time or the effect of policy changes. Health & PE • In PE, students could model heart rate during exercise, where different stages (rest, exercise, recovery) are modeled with a piecewise function. • Students can analyze the graph of hydration levels during a sports event and use function features (like decreasing intervals) to decide when athletes should drink water. Visual Arts and Music • Transformations of graphs (shifts, reflections, stretches) tie directly to transformations in art (moving shapes on a canvas or stretching images). Career and Technical Education • Functions are essential in business, engineering, computer science, and data analysis. • In business, students can create profit functions that model how income changes based on sales. • In computer science, students write actual functions in code to process inputs and outputs, directly connecting math to programming logic. • In construction or engineering, students can graph relationships like material costs vs. project size.	• Understanding the dependent variable (output) if a function of the independent variable (input) • Interpreting function notation in the context of a problem, especially when only the input or output is given (not both). • Understanding that function notation “f(x)” is not multiplication of two variables • Representing a word problems as a mathematical model, such as an equation in function notation • Understanding what a function or its inverse gives you within a context • Predicting future results based on the average rate of change, including understanding of it as a rate • Rewriting a function as its inverse. • Graphing a piecewise function that is not a step function
Connections to Prior Units:	**Connections to Future Units:**
In this unit, students expand and deepen their understanding of functions. They begin with a reminder of the definition of a function (a rule that assigns exactly one output to each input) that they previously saw in grade 8, then get familiar with function notation and use it to compare and analyze functions, write rules for functions, and solve for inputs or outputs.	Connection to Unit 4: Functions • Understanding domain restrictions from inequalities connects to function domains • Graphing regions above/below lines prepares for understanding piecewise functions • Interpreting solution regions builds intuition for function behavior in different intervals Connection to Unit 5: Exponential Functions • Constraints from inequalities help define meaningful domains for exponential contexts • Understanding bounded regions connects to asymptotic behavior • Solving inequalities with variables extends to exponential inequalities Connection to Unit 6: Quadratic Functions • Linear inequality concepts extend to quadratic inequalities • Understanding regions above/below lines prepares for regions above/below parabolas • Systems thinking extends to systems with quadratic

	functions
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**

Engagement
- Real-World Connections
- Interactive Explorations
    - Incorporates dynamic graphing activities
    - Encourages investigation of function behavior
    - Allows for discovery of patterns and relationships

Representation
- Multiple Function Representations
    - Presents functions through graphs, tables, equations, and verbal descriptions
    - Uses mapping diagrams and input-output tables
    - Connects different ways of showing functional relationships
- Function Language Development
    - Introduces function notation gradually with meaning
    - Connects everyday language to mathematical notation
    - Provides structured ways to describe function behavior

Action and Expression
- Varied Analysis Methods
- Technology Tools

Specific Unit 4 Applications
- Introduction to Functions (Lessons 1-5)
    - Multiple ways to understand input-output relationships
    - Various representations of function rules
    - Gradual introduction of notation
- Analyzing Graphs (Lessons 6-9)
    - Visual and numerical approaches to features
    - Multiple methods for finding rate of change
    - Different ways to compare functions
- Domain and Range (Lessons 10-14)
    - Various contexts for understanding valid inputs/outputs
    - Multiple representations of restrictions
    - Real-world applications of domains
- Inverse Functions (Lessons 15-18)
    - Different approaches to understanding reversibility
    - Multiple methods for finding inverses
    - Various applications and contexts

Supporting Multilingual/English Learners

The Illustrative Mathematics curriculum incorporates eight Mathematical Language Routines (MLRs) that support English Language Learners:

MLR1: *Stronger and Clearer Each Time* - Students revise and refine their mathematical language through multiple drafts
* MLR2: *Collect and Displa*y - Students capture and organize language in visual displays
MLR3: *Clarify, Critique, Correct* - Students analyze mathematical writing/talk
MLR4: *Information Gap* - Students share information to solve problems
MLR5: *Co-Craft Questions* - Students create and improve questions
MLR6: *Three Reads* - Students analyze complex mathematical text
* MLR7: *Compare and Connect* - Students connect different mathematical representations
* MLR8: *Discussion Supports* - Students participate in mathematical discussions

MLR2: Collect and Display
Used to organize function notation and representations
Students create visual displays of function relationships

MLR7: Compare and Connect
Applied when connecting different function representations
Students link graphs, tables, and equations

MLR8: Discussion Supports
Structured discussions about function features
Vocabulary development for function concepts

Related *CELP standards:*	Learning Targets:
A MLL can…speak and write about grade-appropriate complex literary and informational texts and topics. **Learning Target**: I can analyze and apply functions, including their notation, graphs, transformations, and real-world applications, to solve problems and model situations. • **Level 1**: With prompting and supports, I can identify basic function-related words and match simple functions to graphs or real-life examples. • **Level 2**: With prompting and supports, I can use function notation and describe basic function behaviors with support. • **Level 3**: With guidance and supports, I can compare functions using notation and graphs, and explain their domain and range in real-world contexts. • **Level 4**: I can write rules for functions, solve for inputs and outputs, and explain transformations with real-life examples. • **Level 5**: I can analyze and model real-world situations with functions, including using inverses and explaining advanced features and transformations.	

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A: Functions and Their Representations Lessons 1-5	• I can sketch a graph of a function given statements in function notation. • I can understand that a relationship between two quantities is a function if there is only one possible output for each input. • I can write equations that represent rules using function notation.	Lesson 1: • I can explain when a relationship between two quantities is a function. Checkpoint A Problem 1 **NOTES: Checkpoint A Problem 1** Consider changing the scenarios to more student friendly relationship • I can identify independent and dependent variables in a function and use words and graphs to represent the function. • I can make sense of descriptions and graphs of functions and explain what they tell us about situations. Lesson 2: • I can use function notation to express functions that have specific inputs and outputs. • I understand what function notation is and why it exists. • When given a statement written in function notation, I can explain what it means in terms of a situation. MOU Problem 1 and 4 Lesson 3: • I can describe the connections between a statement in function notation and the graph of the function. MOU Problem 2 MOU Problem 5 Checkpoint B Problem 1 • I can use function notation to efficiently represent a relationship between two quantities in a situation. Checkpoint B Problem 2 **NOTE: Checkpoint B Problem 2** Add a table/graph with values for students to calculate average rate of change, not just write an expression. • I can use statements in function notation to sketch a graph of a function. Lesson 4: • I can make sense of rules of functions when they are written in function notation, and create tables

		and graphs to represent the functions. MOU Problem 6 • I can write equations that represent the rules of functions. Checkpoint A Problem 2 MOU Problem 4 MOU Problem 6 **NOTES: MOU Problem 6** Students need more exposure to situations like this example with rice. Lesson 5: • I can use technology to graph a function given in function notation and use the graph to find the values of the function. • I know different ways to find the value of a function and to solve equations written in function notation. • I know what makes a function a linear function.
Section B: Analyzing and Creating Graphs of Functions Lessons 6-9	• I can, given a graph of a function, estimate or calculate the average rate of change over a specified interval. • I can interpret key features of a graph—the intercepts, maximums, minimums, and intervals when the function is increasing or decreasing—in terms of a situation. • I can interpret statements about two or more functions written in function notation.	Lesson 6: • I can identify important features of graphs of functions and explain what they mean in the situations represented. MOU Problem 3 • I understand and can use the terms “horizontal intercept,” “vertical intercept,” “maximum,” and “minimum” when talking about functions and their graphs. Checkpoint B Problem 1 MOU Problem 3 • Lesson 7: • I understand the meaning of the term “average rate of change.” MOU Problem 7 **NOTE: MOU Problem 7** Make Part b. one year and not an interval of years. • When given a graph of a function, I can estimate or calculate the average rate of change between two points. MOU Problem 7 Lesson 8: • I can explain the average rate of change of a function in terms of a situation. MOU Problem 7 • I can make sense of important features of a graph and explain what they mean in a situation. • When given a description or a visual representation of a situation, I can sketch a graph that shows important features of the situation. Lesson 9: • I can compare the features of graphs of functions and explain what they mean in the situations represented. • I can make sense of an equation of the form • in terms of a situation and a graph, and know how to find the solutions. • I can make sense of statements about two or more functions when they are written in function

		notation.
Section C: A Closer Look at Inputs and Outputs Lessons 10-14	• I can interpret an absolute value function described in words or in function notation, and create a table of values and a graph to represent the function. • I can interpret the graph of a piecewise function or its rules given in function notation, and explain the rules (orally and in writing) in terms of a situation. • I understand that the domain of a function is the set of all possible inputs and the range is the set of all possible outputs.	Lesson 10: • I know what is meant by the "domain" and "range" of a function. Checkpoint C Problem 1 **NOTE: Checkpoint C Problem 1:** At a minimum (SG), change order of questions to c, a ,b. Students do not describe domain and range of functions in the lesson, they also do not graph an absolute value function by hand without a table. Checkpoint C Problem 2 **NOTE: Checkpoint C Problem 2** Same issue as Problem 1. Students have not determined domain and range from a piecewise function. EOU Problem 1 • When given a description of a function in a situation, I can determine a reasonable domain and range for the function. Checkpoint C Problem 1 Checkpoint C Problem 2 EOU Problem 1 **NOTE: EOU Problem 1:** The graph is misleading to determine the range. Change graph? Lesson 11: • When given a description of a function in a situation, I can determine a reasonable domain and range for the function. Checkpoint C Problem 1 Checkpoint C Problem 2 Lesson 12: • I can make sense of a graph of a piecewise function in terms of a situation and sketch a graph of the function when the rules are given. EOU Problem 5 EOU Problem 7 **NOTE: EOU Problem 7** Change y-axis label to Total Cost instead of Cost • I can make sense of the rules of a piecewise function when they are written in function notation and explain what they mean in the situation represented. Checkpoint C Problem 2 EOU Problem 5 • I understand what makes a function a piecewise function. Lesson 13: • Given a set of numerical guesses and a target number, I can calculate absolute errors and create a scatter plot of the data. EOU Problem 2 • I can analyze and describe features of a scatter plot that shows absolute error data. • I can describe the general relationship between guesses and absolute errors using words or equations.

		EOU Problem 2 Lesson 14: • I can describe the effects of adding a number to the expression that defines an absolute value function. Checkpoint C Problem 1 EOU Problem 3 • I can explain the meaning of absolute value function in terms of distance. • When given an absolute value function in words or in function notation, I can make sense of it and create a table of values and a graph to represent it.
Section D Inverse Functions Lessons 15 - 17	• I can find the inverse of a linear function by solving an equation for the input variable. • I can write a linear function and an inverse function to model data and solve problems.	Lesson 15: • I understand the meaning of "inverse function" and how it could be found. Checkpoint D Problem 1 EOU Problem 4 • When given a linear function that represents a situation, I can use words and equations to describe the inverse function. Checkpoint C Problem 1 Lesson 16: • I can explain the meaning of an inverse function in terms of a situation. EOU Problem 6 • When I have an equation that defines a linear function, I know how to find its inverse. Checkpoint C Problem 1 EOU Problem 4 Lesson 17: • I can write a linear function to model given data and find the inverse of the function. • When given a linear function defined using function notation, I know how to find its inverse. EOU Problem 6
Section E Let's Put It Work Lesson 18	I can use functions to model real-life situations and make predictions.	I can use functions to model data and make predictions.

Unit Title:					
Unit 5: Introduction to Exponential Functions (iM Unit 6)					
Relevant Standards: Bold indicates priority					
HSA-SSE.A HSA-SSE.A.1 HSA-SSE.A.1.b HSA-SSE.B.3.c HSA-REI.A.1 HSA-REI.D.11	HSF-BF.A.1 HSF-BF.A.1.a HSA-CED.A.1 HSA-CED.A.4	HSF-IF.A.2 HSF-IF.B HSF-IF.B.4 HSF-IF.B.5 HSF-IF.B.6 HSF-IF.C HSF-IF.C.7.b HSF-IF.C.7.e HSF-IF.C.8 HSF-IF.C.9	HSF-LE.A.1 HSF-LE.A.1.a HSF-LE.A.1.b HSF-LE.A.1.c HSF-LE.A.2 HSF-LE.A.3 HSF-LE.B.5	HSN-Q.A.1 HSN-Q.A.3	HSS-ID.B.6.a HSS-ID.B.6.c

Essential Question(s):	**Enduring Understanding(s):**
• How can mathematical expressions, equations, and inequalities be used to model and solve real-world problems? • What patterns and relationships exist in different types of functions (linear and exponential), and how do their graphs represent these relationships? • How do the key features of functions (such as intercepts, domain, range, increasing/decreasing behavior) help us analyze and compare different types of functions? • How can properties of exponents be used to simplify expressions, solve equations, and model exponential growth and decay? • How can we distinguish between situations modeled by linear and exponential functions, and what real-world problems are best represented by each?	• Functions describe relationships between variables and can be represented algebraically, graphically, numerically, and verbally. • Exponential functions model situations in which a number repeatedly multiplies or divides (or increases or decreases by a set percentage of the total). • The characteristics of functions, such as intercepts and growth factors, help us analyze and compare different types of functions and their real-world applications. • Patterns in different types of functions help us determine how quantities change over time and predict future values. • The structure of algebraic expressions can be analyzed and rewritten to reveal important information about functions and their graphs. • Exponential functions model real-world situations such as population growth, radioactive decay, and financial investments, and their properties can be understood through transformations and logarithmic relationships.
Demonstration of Learning:	**Pacing for Unit**
Section A Checkpoint Section B Checkpoint Mid-Unit Assessment Section C Checkpoint Section D Checkpoint End-of-Unit Assessment	iM v.360 Pacing and Vertical Content Alignment (gr. 6-11)
Family Overview (link below)	**Integration of Technology:**
https://accessim.org/9-12-aga/algebra-1/unit-6?a=family	Desmos Graphing Technology
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
dependent variable, function, independent variable, function notation, linear function, decreasing (function), horizontal intercept, increasing (function), maximum (of a function), minimum (of a function), vertical intercept, average rate of change, domain, range (of a function), piecewise function, absolute value, vertex (of a graph), inverse (function),	Desmos Classroom Released Activities

Opportunities for Interdisciplinary Connections:	Anticipated misconceptions:
Science • Functions describe real-world scientific phenomena such as population growth, radioactive decay, and projectile motion. Exponential functions model bacteria growth and decay, while quadratic functions describe the trajectory of objects in physics and engineering. Social Studies • Exponential functions model financial growth, such as compound interest, and demographic trends, such as population growth or decline. Health & Physical Education • Functions model heart rate recovery after exercise, which follows an exponential decay pattern, helping students understand cardiovascular health. Distance-time graphs in sports measure speed and endurance, connecting math to athletic performance and health science. Personal Finance • Many activities refer to investments and debt, both of which grow exponentially.	• Many students interpret the exponent as multiplication • Students may conflate an increase of n% with a growth factor of n. • Students often confuse x^2 and 2^x. • Students often use the decay rather than 1-decay as the growth factor for exponential decay. • Students often assume that all functions grow at a constant rate, leading them to misinterpret exponential growth as linear growth or vice versa. • Students may confuse t = 0 and t = 1. • Students may believe that any growth factor that is a fraction represents exponential decay because they assume all fractions are less than one. • Students may conflate 1.05 and 1.5 or think that 1.5 is ⅛ or 1 ⅛
Connections to Prior Units:	**Connections to Future Units:**
Exponential functions grow by multiplying a fixed factor, while linear functions grow by adding a constant amount. Comparing these models, such as simple vs. compound interest, helps students understand different patterns of change in real-world situations. Exponential functions can model data that shows curved trends, such as population growth or radioactive decay. Students use scatter plots and regression to determine whether an exponential or linear function best fits a given set of data.	Connection to Unit 6: Quadratic Functions • Understanding of non-linear growth patterns extends to quadratic growth • Work with exponents transfers to squared terms in quadratic expressions • Experience with curved graphs prepares for parabolas • Comparing rates of change at different points prepares for varying rates in quadratics • Understanding y-intercept as initial value continues with quadratic contexts • Experience with multiple representations (graphs, tables, equations) transfers to quadratics • Analyzing key features of graphs (intercepts, increasing/decreasing) extends to parabolas • Interpreting parameters in context continues with quadratic models • Using technology to explore graphs carries forward
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**

Engagement
• Growth and Decay Contexts
  • Uses compelling real-world scenarios (population growth, compound interest)
  • Connects to student interests through financial literacy
  • Provides authentic purposes for modeling growth patterns
• Pattern Investigation
  • Encourages discovery of exponential patterns
  • Allows for hands-on exploration of growth
  • Builds from concrete to abstract understanding
Representation
• Multiple Representations of Growth
  • Presents exponential relationships through tables, graphs, and equations
  • Uses visual models to show repeated multiplication
  • Connects percent change to exponential growth
• Language Development	

- Builds vocabulary for exponential contexts
- Connects everyday growth language to mathematical terms
- Provides structured ways to describe rates of change

Action and Expression

- Varied Solution Strategies
- Technology Integration
  - Uses calculators for exponent computation
  - Employs graphing tools for visualization
  - Supports exploration of different growth rates

Specific Unit 5 Applications

- Introduction to Growth (Lessons 1-2)
  - Multiple ways to recognize exponential patterns
  - Various contexts for growth exploration
  - Different approaches to describing change
- Growth and Decay (Lessons 3-7)
  - Visual and numerical representations
  - Multiple contexts for decay
  - Various approaches to negative exponents
- Functions and Modeling (Lessons 8-13)
  - Different ways to represent exponential functions
  - Multiple approaches to rate analysis
  - Various modeling strategies
- Financial Applications (Lessons 14-18)
  - Real-world connections to money growth
  - Multiple representations of interest
  - Various compounding scenarios
- Comparing Growth Types (Lessons 19-21)
  - Different methods for comparing rates
  - Multiple ways to analyze patterns
  - Various prediction strategies

Supporting Multilingual/English Learners

The Illustrative Mathematics curriculum incorporates eight Mathematical Language Routines (MLRs) that support English Language Learners:

MLR1: *Stronger and Clearer Each Time* - Students revise and refine their mathematical language through multiple drafts
MLR2: *Collect and Displa*y - Students capture and organize language in visual displays
MLR3: *Clarify, Critique, Correct* - Students analyze mathematical writing/talk
* MLR4: *Information Gap* - Students share information to solve problems
* MLR5: *Co-Craft Questions* - Students create and improve questions
MLR6: *Three Reads* - Students analyze complex mathematical text
* MLR7: *Compare and Connect* - Students connect different mathematical representations
MLR8: *Discussion Supports* - Students participate in mathematical discussions

MLR4: Information Gap
Used for exploring exponential growth patterns
Partners share information to complete problems

MLR5: Co-Craft Questions
Students create questions about exponential situations
Helps develop understanding of exponential relationships

MLR7: Compare and Connect
Used to compare linear and exponential growth
Connect different representations of exponential functions

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

An MLL...determine the meaning of words and phrases in oral presentations and literary and informational text.
Learning Target: I can represent, analyze, and interpret functions in multiple forms to describe relationships, recognize patterns, compare characteristics, and model real-world situations, including exponential growth and decay.

- **Level 1:** With prompting and supports, I can use words, numbers, and visuals to show and describe basic function relationships, such as increasing or decreasing.
- **Level 2:** With prompting and supports, I can use simple sentences, tables, and graphs to explain how a

function changes and what it represents in a real-world situation.

- **Level 3:** With guidance and support, I can describe and compare functions using equations, graphs, and tables, and explain patterns in exponential growth and decay.
- **Level 4:** I can analyze and interpret functions in multiple forms, explain how different representations connect, and apply them to real-world problems.
- **Level 5**: I can fluently analyze, compare, and justify functions using precise mathematical language, explaining how different representations highlight key characteristics in real-world situations.

Lesson Sequence	Learning Target	Success Criteria/Assessment
Section A: Looking at Growth Lessons 1-2	• I can compare linear and exponential relationships by performing calculations. • I can describe patterns in tables that represent linear and exponential relationships.	Lesson 1 • I can compare growth patterns using calculations and graphs. Lesson 2 • I can use words and expressions to describe patterns in tables of values. • When I have descriptions of linear and exponential relationships, I can write expressions and create tables of values to represent them. Checkpoint A problem 1 Checkpoint A problem 2
Section B: A New Kind of Relationship Lessons 3-7	• I can interpret a negative exponent in equations that represent exponential growth or decay. • I can write an equation of the form $y = a \cdot b^x$ to represent a quantity a that changes by a growth factor b. • I can write and graph an equation that represents exponential decay to solve problems.	Lesson 3 • I can explain the connections between an equation and a graph that represents exponential growth. • I can write and interpret an equation that represents exponential growth. MOU problem 1 **NOTE: MUA** Notes say no calculator for the test. None of the high school standards involve computation so calculators should be allowed. MOU problem 4 EOU problem 1 • I can graph equations that represent quantities that change by a growth factor that is greater than 1. MOU Problem 6 Lesson 4 • I can explain the meanings of a and b in an equation that represents exponential decay and is written as $y = a \cdot b^x$. Checkpoint B problem 1 • I can find a growth factor from a graph and write an equation to represent exponential decay. • I can graph equations that represent quantities that change by a growth factor that is between 0 and 1. Checkpoint B problem 3 Lesson 5 • I can use only multiplication to represent "decreasing a quantity by a fraction of itself." • I can write an expression or equation to represent a quantity that decays exponentially. Checkpoint B problem 1 • I can interpret an equation that represents exponential decay. MOU Problem 7

		• I know the meanings of “exponential growth” and “exponential decay.” Lesson 6 • I can use graphs to compare and contrast situations that involve exponential decay. • I can use information from a graph to write an equation that represents exponential decay. Lesson 7 • I can describe the meaning of a negative exponent in equations that represent exponential decay. Checkpoint B problem 2 MOU problem 5 part 2 • I can write and graph an equation that represents exponential decay to solve problems. MOU Problem 7
Section C: Exponential Functions Lessons 8-13	• I can describe the effect of changing a and b on a graph that represents $y = a \cdot b^x$. • I can use function notation to write equations that represent exponential relationships.	Lesson 8 • I can use function notation to write equations that represent exponential relationships EOU Problem 1 • When I see relationships in descriptions, tables, equations, or graphs, I can determine whether the relationships are functions. Checkpoint C problem 1.1 Lesson 9 • I can analyze a situation and determine whether it makes sense to connect the points on the graph that represents the situation. • When I see a graph of an exponential function, I can make sense of and describe the relationship using function notation. MOU Problem 5 Lesson 10 • I can calculate the average rate of change of a function over a specified period of time. • I know how the average rate of change of an exponential function differs from that of a linear function. Lesson 11 • I can use exponential functions to model situations that involve exponential growth or decay. Checkpoint C problem 1.2 • When given data, I can determine an appropriate model for the situation described by the data. MOU Problem 3 Lesson 12 • I can describe the effect of changing $a$and b on a graph that represents $f(x) = a \cdot b^x$. Checkpoint C problem 2 MOU Problem 2 • I can use equations and graphs to compare exponential functions. Lesson 13 • I can explain the meaning of the intersection of the graphs of two functions in terms of the situations they represent. • When I know two points on a graph of an

		exponential function, I can write an equation for the function. EOU Problem 6 **NOTE: EOU Problem 6** Problem 6 is more difficult to interpret than it is to answer. If the idea is that the output is 2^3 times larger after x increases by 3, it should be worded that way.
Section D: Percent Growth and Decay Lessons 14-18	• I can calculate the result of repeated percent increase for the same initial balance and interest rate, but compounded at different intervals. • I can justify why applying a percent increase p, n times, is not equivalent to applying the percent np.	Lesson 14 • I can find the result of applying a percent increase or decrease on a quantity. • I can write different expressions to represent a starting amount and a percent increase or decrease. Checkpoint D problem 1 EOU Problem 3 Lesson 15 • I can use graphs to illustrate and compare different percent increases. • I can write a numerical expression or an algebraic expression to represent the result of applying a percent increase repeatedly. EOU problem 5 Lesson 16 • I can explain why applying a percent increase, p, n times is like or unlike applying the percent increase np. Checkpoint D problem 1 Lesson 17 • I can calculate interest when I know the starting balance, interest rate, and compounding intervals. EOU problem 2 EOU problem 4 • When given interest rates and compounding intervals, I can choose the better investment option. Checkpoint D problem 2 Lesson 18 • I can solve problems using exponential expressions written in different ways. EOU problem 2 • I can write equivalent expressions to represent situations that involve repeated percent increase or decrease. EOU problem 3
Section E: Comparing Linear and Exponential Functions Lessons 19-20	• I can use rates of change, and show that, for any equal intervals of the independent variable, an exponential function always increases or decreases by an equal factor. • I can use tables, calculations, and graphs to compare growth rates of linear and exponential functions.	Lesson 19 • I can use tables, calculations, and graphs to compare growth rates of linear and exponential functions and to predict how the quantities change eventually. Checkpoint E problem 2 EOU problem 7 Lesson 20 • I can calculate rates of change of functions given graphs, equations, or tables. • I can use rates of change to describe how a linear function and an exponential function change over equal intervals. Checkpoint E problem 1

		EOU problem 6
Section F: Let's Put It to Work Lesson 21	• I will choose and write a linear or exponential function to model real-world data. • I can determine and explain (in writing) how well a function models the given data. • I can use given population data to calculate or estimate growth rates and make predictions.	Lesson 21 • I can determine how well a chosen model fits the given information. • I can determine whether to use a linear function or an exponential function to model real-world data.

Unit Title:					
Unit 6: Introduction to Quadratic Functions (iM Unit 7)					
Relevant Standards: Bold indicates priority					
HSA-SSE.A HSA-SSE.A.1 HSA-SSE.A.1.b HSA-SSE.A.2 HSA-SSE.B.3 HSA-SSE.B.3.c HSA-APR.A	HSF-BF.A.1 HSF-BF.A.1.a HSF-BF.B.3	HSF-IF.A.2 HSF-IF.B HSF-IF.B.4 HSF-IF.B.5 HSF-IF.B.6 HSF-IF.C HSF-IF.C.7 HSF-IF.C.7.a HSF-IF.C.7.e HSF-IF.C.8 HSF-IF.C.9	HSF-LE.A.1 HSF-LE.A.1.a HSF-LE.A.1.b HSF-LE.A.1.c HSF-LE.A.2 HSF-LE.A.3 HSF-LE.B.5	HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	HSS-ID.B.6.a

Essential Question(s):	**Enduring Understanding(s):**
• How do different forms of a function's equation help us understand its key features and behavior? • What do the key features of a function—such as intercepts, maximums, minimums, and end behavior—reveal about its graph and real-world meaning? • How do transformations, such as shifts, reflections, and stretches, affect the graph and equation of a function? • How do we determine whether a function best models a real-world situation as linear, quadratic, or exponential? • What are the different kinds of growth and how do they compare? • How can we analyze and compare functions that are represented in different ways, such as equations, graphs, tables, and verbal descriptions? • How can expressing the same equation in different forms reveal different properties of a quadratic function?	• Functions can be represented in multiple ways—algebraically, graphically, numerically, and verbally—and each representation provides different insights into the function's behavior. • Rewriting expressions through factoring, expanding, and completing the square reveals important characteristics of functions, such as zeros, intercepts, and vertex points. • Transformations, including shifts, reflections, stretches, and compressions, help us understand how function graphs change and how different functions relate to one another. • The structure of an algebraic expression can be analyzed and rewritten to make solving equations easier and to reveal key features of the function it represents. • Exponential, linear, and quadratic functions model different types of real-world relationships, and understanding their differences allows us to choose the best function for a given situation. • Comparing functions in different forms—such as equations, tables, graphs, and descriptions—helps us analyze relationships and make predictions. • Projectile motion can be represented using a quadratic function.
Demonstration of Learning:	**Pacing for Unit**
Section A Checkpoint Section B Checkpoint Section C Checkpoint Mid-Unit Assessment Section D Checkpoint End-of-Unit Assessment	iM v.360 Pacing and Vertical Content Alignment (gr. 6-11)
Family Overview (link below)	**Integration of Technology:**
https://accessim.org/9-12-aga/algebra-1/unit-7?a=family	Desmos Graphing Technology
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Quadratic expression, quadratic function, vertex, zero, factored form, standard form, vertex form	Desmos Released Classroom Activities

Opportunities for Interdisciplinary Connections:	Anticipated misconceptions:
Science • Quadratic functions describe projectile motion and acceleration in physics, helping students understand real-world applications of parabolic paths. • Transformations of functions relate to wave motion, sound frequencies, and light reflection in physics. Economics & Business • Linear and quadratic models help analyze profit, revenue, and cost trends in business scenarios. • Understanding function transformations allows for predicting market growth and stock trends over time. Computer Science & Engineering • Quadratic and exponential functions play a role in algorithm efficiency and machine learning models in computer science. • Graph transformations and function comparisons help analyze digital image processing, scaling, and animation effects in game development.	• Many students misunderstand that transformations (shifts, reflections, stretches) apply to all points on a function, not just specific ones like the vertex. • Some students assume that exponential and quadratic functions both grow at a constant rate instead of recognizing that exponentials grow by multiplication while quadratics do not. • Students may incorrectly believe that the x-intercepts (solutions) are always the maximum or minimum of the function, rather than understanding how the vertex relates to symmetry and extrema. • Some students struggle to compare functions across different representations (graph, table, equation, verbal) and focus only on algebraic form.
Connections to Prior Units:	**Connections to Future Units:**
Prior to this unit, students have studied what it means for a relationship to be a function, used function notation, and investigated linear and exponential functions. In this unit, they look at some patterns that grow quadratically and contrast this growth with linear and exponential growth.	Connections to Units in Future Courses Transformations of Functions • Understanding shifts, reflections, stretches, and compressions of functions lays the foundation for geometric transformations in Geometry and function transformations in Algebra 2, including rational, logarithmic, and trigonometric functions. Circles, Higher-Degree Polynomials, and Rational Expressions • Skills like factoring and completing the square extend to deriving the equation of a circle in Geometry and factoring and solving higher-degree polynomials in Algebra 2. Logarithms and Advanced Growth Models • Working with exponential growth and decay prepares students for logarithmic functions and solving logarithmic equations in Algebra 2, which are used to model real-world scenarios like sound intensity and pH levels. Inverse Functions • The concept of inverse functions expands into logarithmic inverses of exponentials and inverse trigonometric functions in Algebra 2.
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**

Engagement
• Physical Phenomena Connections
  • Uses motion and projectile contexts to introduce quadratics
  • Connects to real-world applications (sports, physics)
  • Provides concrete experiences with parabolic motion
• Pattern Exploration
  • Builds understanding through geometric patterns
  • Encourages investigation of changing rates of change
  • Allows discovery of quadratic relationships
Representation
• Multiple Forms of Quadratics
• Visual and Dynamic Models
  • Employs technology for dynamic graphing	

- Uses geometric models to build understanding
- Provides multiple ways to visualize transformations

Action and Expression

- Varied Approaches to Forms
- Technology Integration
  - Uses graphing tools to explore transformations
  - Supports visualization of different forms
  - Enables efficient comparison of representations

Specific Unit 6 Applications

- Introduction to Change (Lessons 1-2)
  - Multiple ways to recognize quadratic patterns
  - Various contexts for exploring change
  - Different approaches to rates of change
- Building Understanding (Lessons 3-7)
  - Geometric pattern exploration
  - Comparison with other function types
  - Multiple modeling contexts
- Different Forms (Lessons 8-10)
  - Various representations of equivalence
  - Multiple approaches to form conversion
  - Different ways to interpret forms
- Graphing Skills (Lessons 11-17)
  - Multiple methods for graphing each form
  - Various approaches to transformations
  - Different strategies for analyzing features

Supporting Multilingual/English Learners

The Illustrative Mathematics curriculum incorporates eight Mathematical Language Routines (MLRs) that support English Language Learners:

MLR1: *Stronger and Clearer Each Time* - Students revise and refine their mathematical language through multiple drafts
* MLR2: *Collect and Displa*y - Students capture and organize language in visual displays
MLR3: *Clarify, Critique, Correct* - Students analyze mathematical writing/talk
MLR4: *Information Gap* - Students share information to solve problems
MLR5: *Co-Craft Questions* - Students create and improve questions
* MLR6: *Three Reads* - Students analyze complex mathematical text
MLR7: *Compare and Connect* - Students connect different mathematical representations
*MLR8: *Discussion Supports* - Students participate in mathematical discussions

MLR2: Collect and Display

Organizing quadratic patterns and relationships
Creating visual representations of quadratic functions

MLR6: Three Reads

Applied to projectile motion problems
Breaking down complex quadratic contexts

MLR8: Discussion Supports

Structured discussions about quadratic features
Supporting vocabulary for quadratic relationships

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

An EL can . . . construct grade appropriate oral and written claims and support them with reasoning and evidence.
Learning Target: I can understand and represent quadratic functions using different forms (standard, factored, vertex), and I can identify key features of their graphs.

- **Level 1**: With prompting and supports, I can recognize basic characteristics of quadratic functions and graphs.
- **Level 2**: With prompting and supports, I can identify key parts of a quadratic graph, like the vertex and its intercepts.
- **Level 3**: With guidance and supports, I can represent quadratic functions in standard or factored form and find key features like the vertex and its intercepts.
- **Level 4**: I can use different forms of quadratic functions (standard, factored, vertex) to graph and analyze key features.
- **Level 5**: I can analyze and solve quadratic functions using multiple representations and describe the

relationships between the features of the graph and the equation.		
Lesson Sequence	**Learning Target**	**Success Criteria/Assessment**
Section A: A Different Kind of Change Lessons 1-2	• I can comprehend that a "quadratic relationship" can be expressed with a squared term. • I can determine and explain whether a visual pattern represents a linear, exponential, or quadratic relationship.	Lesson 1 • I can create drawings, tables, and graphs that represent the area of a garden. • I can recognize a situation represented by a graph that increases and then decreases. Lesson 2 • I can describe how a pattern is growing. Checkpoint B Problem 1 Mid Unit Problem 1 • I can tell whether a pattern is growing linearly, exponentially, or quadratically. Checkpoint A Mid Unit Problem 1 • I know a quadratic expression has a squared term. Checkpoint A
Section B: Quadratic Functions Lessons 3-7	• I can interpret quadratic functions that represent a physical phenomenon, given expressions and graphs. • I can use graphs, tables, and calculations to show that exponential functions eventually overtake quadratic functions.	Lesson 3 • I can explain using graphs, tables, or calculations that exponential functions eventually grow faster than quadratic functions. Mid Unit Problem 5 • I can recognize quadratic functions written in different ways. • I can use information from a pattern of shapes to write a quadratic function. Mid Unit Problem 1 Lesson 4 • I can explain using graphs, tables, or calculations that exponential functions eventually grow faster than quadratic functions. Mid Unit Problem 5 Lesson 5 • I can explain the meaning of the terms in a quadratic expression that represents the height of a falling object. Checkpoint B Problem 2 Mid Unit Problem 2 • I can use tables, graphs, and equations to represent the height of a falling object. Lesson 6 • I can create quadratic functions and graphs that represent a situation. • I can relate the vertex of a graph and the zeros of a function to a situation. • I know that the domain of a function can depend on the situation it represents. Mid Unit Problem 2 Lesson 7 • I can choose a domain that makes sense in a revenue situation. Mid Unit Problem 7 • I can model revenue with quadratic functions and graphs. Mid Unit Problem 4 **NOTE: MOU Problem 4** Test question context is area but the Lesson is

		based on revenue Mid Unit Problem 7 • I can relate the vertex of a graph and the zeros of a function to a revenue situation.
Section C: Working with Quadratic Expressions Lessons 8-10	• I can coordinate a quadratic expression given in factored form and the intercepts of its graph. • I can use the distributive property to write equivalent quadratic expressions from factored into standard form.	Lesson 8 • I can rewrite quadratic expressions in different forms by using an area diagram or the distributive property. Checkpoint C Mid Unit Problem 3 Mid Unit Problem 6 Lesson 9 • I can rewrite quadratic expressions given in factored form, in standard form, using either the distributive property or a diagram. Mid Unit Problem 3 Mid Unit Problem 6 • I know the difference between "factored form" and "standard form." Checkpoint C Lesson 10 • I can explain the meaning of the intercepts on a graph of a quadratic function in terms of the situation it represents. Mid Unit Problem 7 EOU Problem 5 **NOTE: EOU Problem 5** Clare's function in factored form is not great! Question b... Can we give a different time value so that someone's height is higher and they are NOT the same? EOU Problem 7 • I know how the numbers in the factored form of a quadratic expression relate to the intercepts of its graph. Mid Unit Problem 7 EOU Problem 5 EOU Problem 7
Section D: Features of Graphs of Quadratic Functions Lessons 11-17	• I can explain how a graph is affected by changing parameters in quadratic expressions written in standard, factored, and vertex forms. • I can use an equation in vertex form to identify the maximum or minimum of a quadratic function.	Lesson 11 • I can graph a quadratic function given in factored form. EOU Problem 4 • I know how to find the vertex and y-intercept of the graph of a quadratic function in factored form without graphing it first. EOU Problem 4 EOU Problem 5 Lesson 12 • I can explain how the a and c in $y = ax^2 + bx + c$ affect the graph of the equation. Checkpoint D Problem 1 EOU Problem 3 • I understand how graphs, tables, and equations that represent the same quadratic function are related. Lesson 13

		• I can explain how the b in $y = ax^2 + bx + c$ affects the graph of the equation. • I can match equations given in standard and factored form with their graph. EOU Problem 1 EOU Problem 2 Lesson 14 • I can explain how a quadratic equation and its graph relate to a situation. EOU Problem 5 Lesson 15 • I can recognize the "vertex form" of a quadratic equation. • I can relate the numbers in the vertex form of a quadratic equation to its graph. EOU Problem 2 EOU Problem 6 Lesson 16 • I can graph a quadratic function given in vertex form, showing a maximum or minimum and the y-intercept. • I know how to find a maximum or a minimum of a quadratic function given in vertex form without first graphing it. Checkpoint D Problem 2 EOU Problem 6 Lesson 17 • I can describe how changing a number in the vertex form of a quadratic function affects its graph. EOU Problem 6

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Introduction to CWE	CTE	11-12	0.5 (Half-Year Course)

Course Description:

In *Introduction to Cooperative Work Experience (CWE)* students will gain essential skills and knowledge necessary to be successful in future employment. Topics include career readiness, career acquisition, employability skills, employment laws, and job safety. Students who successfully complete the course with a minimum grade of 75% will meet the prerequisite for CWE 50/100. The CWE 50/100 course provides an opportunity to participate in an internship within the student's chosen career pathway.

Aligned Core Resources:	Connection to the ***BPS Vision of the Graduate***
• NGPF (Next Generation Personal Finance) • Skills to Pay the Bills - Mastering Soft Skills for Workplace Success • Youth @ Work Talking Safety: A Safety & Health Curriculum for Young Works, CT Edition • NBEA Standards (2023)	Meaningfully Contribute to a Global Society • Collaboration • Social and Cross-Cultural Skills • Empathy Effectively Communicate in a Global Society • Communication • Technology Literacy Successfully Employ Skills for Self-Sufficiency • Goal Directed
Additional Course Information: ***Knowledge/Skill Dependent courses/prerequisites***	**Link to *Completed Equity Audit***
N/A	Intro to CWE 50/100 Equity Curriculum Review

Standard Matrix

District Learning Expectations and Standards (NBEA National Standards 2023)	Unit 1: Career Readiness	Unit 2: Career Acquisition	Unit 3: Employability Skills	Unit 4: Employment Laws	Unit 5: Worker Safety
Business Law					
1. Basics of the Law Analyze the relationship between ethics and law and describe the law's sources, the structure of the court system, different classifications of procedural law, and different classifications of substantive law.				X	X
3. Agency and Employment Analyze the role and importance of agency law and employment law related to conduct of business in the national and international workplace.				X	X
Career Development					
1. Strategic Career Planning Apply knowledge gained through individual assessment eo develop a comprehensive set of goals and an individual career plan.	X				
2. Career Exploration and Research Utilize career resources to develop a career information portfolio that includes international career opportunities.	X				
3. Career Readiness Expectations Relate the importance of career readiness skills to career development.					
4. School-to-Career Transition Develop strategies to effectively transition from school to career		X			
5. Lifelong Learning Relate the importance of lifelong learning to personal career success.	X				
Communication					
1. Foundations of Communication Listen actively, use the communication, read and research information, and integrate technology to enhance communication effectiveness.			X		
2. Interpersonal Skills			X		

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.			X		
4. Spoken Communication Demonstrate professional speaking techniques and strategies			X		
5. Employment Communication Communicate effectively for employment success.	X	X			

Unit Links

Unit 1: Career Readiness
Unit 2: Career Acquisition
Unit 3: Employability Skills
Unit 4: Employment Laws
Unit 5: Worker Safety

Unit 1: Career Readiness

The Career Readiness unit will allow students to develop an understanding of their personal skill sets and interests in order to identify career fields that are best fit for them. Students will learn how to develop career goals and a pathway for reaching their goals.

Relevant Standards: Bold indicates priority

NBEA Standards 2023

Career Development

1. Strategic Career Planning
Apply knowledge gained through individual assessment eo develop a comprehensive set of goals and an individual career plan.
2. Career Exploration and Research
Utilize career resources to develop a career information portfolio that includes international career opportunities.
5. Lifelong Learning
Relate the importance of lifelong learning to personal career success.

Communication

5. Employment Communication
Communicate effectively for employment success.

Essential Question(s):	**Enduring Understanding(s):**
• How do I assess my strengths, interests, and skills to create a personalized career plan? • What career resources can I use to research different industries, job opportunities, and career paths? • Why is lifelong learning important for career growth and how can I continue learning throughout my career?	• Self-awareness and goal-setting are critical components of career success. • Exploring various career paths broadens career options and informs decision-making • Lifelong learning is critical to adapting to the evolving job markets and ensuring continued career growth. • Career planning is an ongoing process that involves setting goals, revising them, and adapting to new opportunities and challenges.
Demonstration of Learning:	**Pacing for Unit**
• Self-reflection • Interest Surveys • Learning Styles • Identify future lifestyle goals • Career Goals • Strategies • Research • Informational Interviews • Career Research Presentation	7 Block Periods
Family Overview (link below)	**Integration of Technology:**
Intro to CWE Family Overview Intro to CWE Family Overview - Spanish	Career Research Career Presentation
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Career Plan, Career, Goals, Objectives, Strategies, Employment, Personal Career Plan, Career Goals, Career Objectives, Strategies, Employment Opportunities. Career Research, Interest Surveys, Learning Style, Lifestyle goals, SMART Goals	Career OneStop O*Net Online DOL Occupational Outlook Handbook
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
N/A	• A job & a career are the same. • You do not need a plan to be successful. • You only need to plan for your career once. • You need to choose a career for life.

Connections to Prior Units:	Connections to Future Units:
N/A	Unit 2: Students will use their career research, interests, learning styles, and goals to develop skills to write a resume, cover letter, and prepare responses to interview questions. Unit 3: Students will have a general understanding of their goals that will help them learn and assess their employability skills and determine areas of strengths and weaknesses for their potential career.

Differentiation through *Universal Design for Learning*

UDL Indicator	Teacher Actions

Engagement

7.1 Provide options for recruiting interest

- Teacher will allow students to develop their career plan based on individual interest, strengths, and passions.

7.2 Provide options for sustaining effort and persistence]

- Teacher will chunk assignments into more manageable tasks, provide positive reinforcement, and peer collaborations to support developing career goals.

Representation

1.1 Support opportunities to customize the display of information

- Teacher will provide students with multiple resources - written video, etc. to conduct research in a learning style that best suits them.

2.1 Clarify vocabulary, symbols, and language structures

- Teacher will provide glossary, infographics, etc. to ensure students can comprehend career planning language.

Action/Expression

4.1 Use multiple media for communication

- Teacher will provide students with multiple methods to demonstrate their learning through written reflections and presentations.

Supporting Multilingual/English Learners

Related *CELP standards:*	Learning Targets:

I can identify my strengths, interests, and skills and use this information to set personalized career goals.

- Level 1: I can recognize and name some of my personal strengths, interests, and skills with the help of visuals or support.
- Level 2: I can describe my strengths, interests, and skills using simple words and phrases, and begin to explain how they relate to my future career goals.
- Level 3: I can describe my strengths, interests, and skills more clearly and use them to set basic, personalized career goals.
- Level 4: I can independently identify and analyze my strengths, interests, and skills and use this information to set specific and realistic career goals.
- Level 5: I can thoroughly analyze my strengths, interests, and skills and create detailed, long-term career goals, explaining how they align with my personal aspirations and future career opportunities.

I can explore and identify career clusters that align with my interests, skills, and values.

- Level 1: I can recognize and match basic career types or clusters to simple interests or activities with support.
- Level 2: I can identify some career clusters that match my simple interests, skills, and values, using basic vocabulary.
- Level 3: I can explain how my interests, skills, and values relate to certain career clusters and start identifying which ones might be a good fit for me.
- Level 4: I can independently explore a variety of career clusters and explain how my skills, interests, and values align with specific clusters, beginning to make connections to my future career path.
- Level 5: I can thoroughly explore multiple career clusters and analyze how my personal interests, skills, and values align with a range of careers, using this information to refine and make informed decisions about my future career path.

I can research and explore a variety of career options and understand the qualifications, duties, and opportunities available in those fields.

- Level 1: I can recognize basic information about different careers with support and identify some simple qualifications or duties for specific jobs.
- Level 2: I can name a few career options and understand basic duties or requirements for those jobs with some support.
- Level 3:I can explore and explain different career options and identify some basic qualifications, duties, and opportunities associated with those careers.
- Level 4: I can independently research various careers and explain the qualifications, duties, and opportunities available in those fields with a clear understanding of how they align with my interests.
- Level 5:I can conduct thorough research on a range of careers, analyze the qualifications, duties, and opportunities in

each, and evaluate which careers best match my interests, skills, and goals.

I can develop and deliver a professional presentation about a career I am interested in, demonstrating an understanding of a job's duties, qualifications, and opportunities.

- Level 1: I can share simple information about a career using visuals, words, or phrases with help from a teacher or peer.
- Level 2: I can provide basic information about a career I am interested in, using short sentences to describe the job, duties, and some qualifications.
- Level 3:I can create a simple presentation about a career, explaining key duties, qualifications, and opportunities, and deliver it using basic language and visuals.
- Level 4: I can develop and deliver a clear presentation about a career, explaining its duties, qualifications, and opportunities in more detail, using appropriate language and visuals.
- Level 5: I can independently develop and deliver a professional presentation about a career, providing a thorough explanation of the job's duties, qualifications, and opportunities, using advanced language and appropriate visuals.

I can create a step-by-step career plan that includes short-term goals, long-term goals, and the education or experiences needed to achieve them.

- Level 1: I can share simple information about a career using visuals, words, or phrases with help from a teacher or peer.
- Level 2: I can provide basic information about a career I am interested in, using short sentences to describe the job, duties, and some qualifications.
- Level 3: I can create a simple presentation about a career, explaining key duties, qualifications, and opportunities, and deliver it using basic language and visuals.
- Level 4: I can develop and deliver a clear presentation about a career, explaining its duties, qualifications, and opportunities in more detail, using appropriate language and visuals.
- Level 5: I can independently develop and deliver a professional presentation about a career, providing a thorough explanation of the job's duties, qualifications, and opportunities, using advanced language and appropriate visuals.

Lesson Sequence	Learning Target	Success Criteria/ Assessment & Resources	
1	I can identify my strengths, interests, and skills and use this information to set personalized career goals.	• I can complete a self-assessment to identify my personal strengths, interests, and skills. • I can reflect on my self-assessment results to determine how my strengths and interests align with potential career paths.	
2	I can explore and identify career clusters that align with my interests, skills, and values.	• I can research and list at least three career clusters that match my personal interests and skills. • I can describe the key characteristics and typical careers found in each selected career cluster. • I can compare and contrast the opportunities, working conditions, and required qualifications within different career clusters. • I can explain how one or more career clusters connect to my personal goals for education, work-life balance, and career growth.	
3	I can research and explore a variety of career options and understand the qualifications, duties, and opportunities available in those fields.	• I can identify and research at least three different career options, including key duties and responsibilities. • I can gather and explain the educational qualifications and skills required for each career option. • I can analyze the job outlook, salary potential, and advancement opportunities for each career option. • I can compare and contrast at least two career options, considering personal preferences such as work environment, salary, and long-term growth.	Career OneStop O*Net Online DOL Occupational Outlook Handbook
4	I can develop and deliver a professional presentation about a career I am interested in, demonstrating an	• I can research and gather relevant information about the chosen career, including duties, qualifications, salary, and career outlook.	

	understanding of a job's duties, qualifications, and opportunities.	• I can organize my presentation into clear sections, such as introduction, main body (duties, qualifications, opportunities), and conclusion. • I can create visual aids (e.g., slides, charts, or images) to enhance my presentation and support key points. • I can present confidently to the class, speaking clearly and engaging the audience with appropriate body language and eye contact.
5	I can create a step-by-step career plan that includes short-term goals, long-term goals, and the education or experiences needed to achieve them.	• I can identify and describe my long-term career goal and explain why it is important to me. • I can break down my long-term goal into short-term goals that are achievable within a specific time frame. • I can identify the educational requirements, training, and experiences needed to achieve my short-term and long-term goals. • I can create a timeline with specific milestones for achieving both short-term and long-term goals.

Unit 2: Career Acquisition

The Career Acquisition Unit will provide students with the skills and opportunity to secure a position in their desired career. Students will prepare a personal resume and cover letter as well as practice interviewing skills.

Relevant Standards: Bold indicates priority

NBEA Standards 2023
Career Development
4. School-to-Career Transition
Develop strategies to effectively transition from school to career
Communication
5. Employment Communication
Communicate effectively for employment success.

Essential Question(s):	**Enduring Understanding(s):**
• What preparation do I need to do in order to effectively apply for a job? • How do I tailor my resume for different job positions? • How do I develop a cover letter that highlights my qualifications and makes a positive impression on potential employers? • How do I prepare for an interview in terms of common interview questions, appropriate dress, body language, etc.? • What role does social media platforms play in my career search and how can I use them effectively?	• Acquiring a job position involves multiple steps and evolves overtime. • It is critical to understand your strengths, skills, interests, and values. • Job materials (applications, resumes, cover letters) must be tailored to each job that you apply to. • Effective interviewing skills include answering questions effectively and presenting yourself in a professional manner. • Your online presence can influence your career opportunities - both positively and negatively.
Demonstration of Learning:	**Pacing for Unit**
• Research Potential Job Opportunities using online resources • Resume • Completed Application • Cover Letter • Interviewing • Mock Interviews • Self-reflection on interviews • Thank you note	19 Block Periods
Family Overview (link below)	**Integration of Technology:**
Intro to CWE Family Overview Intro to CWE Family Overview - Spanish	Students will use Google Docs to create their resume, cover letter, and thank you note in a professional manner. Students may choose to use templates from Google Docs to support the professional look of each document.
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Resume, Interview, Cover Letter, Job Opportunity Research, Application	
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Language Arts: Writing, grammar, tone, clarity, audience **Technology:** Use of software, social media, online research	• Interviews are only about answering questions. • You should only talk about your qualifications during the interview. • A cover letter is a restatement of your resume. • You can use the same cover letter for every job application.

	• A cover letter is not necessary. • You should list all experiences on your resume. • The more you include on your resume, the better. • You should apply for as many jobs as possible without customizing your application. • No one reads the application. • Thank you notes are optional after an interview. • Thank you notes are only necessary if you are offered the job.
Connections to Prior Units:	**Connections to Future Units:**
Unit 1: Students have assessed their skills, interests, and values. Students have decided on a career that they are interested in. Students will now use what they have learned about themselves and their career to craft a resume and cover letter, complete an application, and prepare for a mock interview.	Unit 3: When students learn about employability skills, they will be able to further refine their cover letter and resume.
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement 7.1 Optimize choice and autonomy • Allow students to choose the job(s) that they are applying for. • Allow students to tailor their resume, cover letter, interview questions, and job application to the job of their choice. 7.2 Optimize relevance, value, and authenticity • Provide support for students to connect personal interests and career goals to their cover letter. • Guides students to take notes after the mock interview to support the writing of their thank you letter. 7.4 Address biases, threats, and distractions • Provide checklists for resumes, cover letters, thank you notes, and job applications to support students in meeting the requirements of each. • Develop interview scenarios for students to ensure minimize students uncomfortability with interviewing *Representation* 1.2 Support multiple ways to perceive information • Students have the option of templates for resumes and cover letters • Provide examples, articles, videos to support in the writing of the cover letter, resumes, and thank you letters • Provide videos to demonstrate effective and ineffective interviewing practices. • Provide examples of strong and weak job applications. *Expression/Action* 5.1: Use multiple media for communication • Students may choose to handwrite their thank you letter or send it via email.	
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
I can effectively search for job opportunities that match my interests, skills, and qualifications. • Level 1: I can identify job opportunities with the help of a teacher or guide. • Level 2: I can search for job opportunities using basic filters such as location, job type, or industry. • Level 3: I can search for job opportunities and evaluate if they match my skills and qualifications. • Level 4: I can search for job opportunities, evaluate them in detail, and refine my search to find the best matches for my qualifications. • Level 5: I can independently conduct a comprehensive job search, critically evaluate job opportunities, and apply a strategic approach to finding the best matches for my career goals. I can complete a job application accurately and thoroughly. • Level 1: I can identify basic sections of a job application with support. • Level 2: I can complete a job application with guidance, using basic personal and employment information. • Level 3: I can complete a job application independently, using my personal and employment information accurately. • Level 4: I can complete a job application thoroughly and accurately, tailoring my responses to align with the job requirements. • Level 5: I can complete a comprehensive job application, ensuring that it reflects my qualifications and aligns with the job's needs.	

I can create a professional resume that highlights my skills, experiences, and qualifications.

- Level 1: I can recognize the basic sections of a resume with support.
- Level 2: I can create a basic resume that includes personal information and education history with some guidance.
- Level 3: I can create a professional resume that includes my personal information, education, skills, and experiences.
- Level 4: I can create a polished and professional resume that clearly highlights my skills, experiences, and qualifications.
- Level 5: I can create a professional, targeted resume that effectively showcases my qualifications and aligns with job or career goals.

I can provide constructive peer feedback and apply the feedback to revise my resume effectively.

- Level 1: I can recognize simple aspects of a resume that might need improvement with support.
- Level 2: I can provide simple peer feedback and make minor changes to my resume based on feedback.
- Level 3: I can provide specific, constructive feedback on a peer's resume and apply feedback to improve my own resume.
- Level 4: I can provide thoughtful, constructive feedback on a peer's resume and thoughtfully apply feedback to enhance my resume.
- Level 5: I can provide detailed, constructive peer feedback and independently apply feedback to create a polished, professional resume.

I can write a tailored cover letter that effectively communicates my interest in a job and demonstrates my qualifications.

- Level 1: I can recognize the basic sections of a cover letter with support.
- Level 2: I can write a simple cover letter with some guidance, expressing interest in the job and mentioning basic qualifications.
- Level 3: I can write a cover letter that includes my interest in the job, relevant qualifications, and why I am a good fit for the position.
- Level 4: I can write a tailored cover letter that effectively communicates my interest in the job and clearly demonstrates my qualifications.
- Level 5: I can write a highly polished, tailored cover letter that persuasively demonstrates my qualifications and aligns with the job requirements.

I can provide constructive peer feedback and apply the feedback to revise my cover letter effectively.

- Level 1: I can recognize basic aspects of a cover letter that may need improvement with support.
- Level 2: I can provide simple, constructive feedback on a peer's cover letter and apply feedback to improve my own cover letter.
- Level 3: I can provide specific, constructive feedback to a peer and apply feedback to revise my cover letter effectively.
- Level 4: I can provide thoughtful, constructive feedback to a peer and effectively apply feedback to strengthen my cover letter.
- Level 5: I can provide detailed, actionable peer feedback and independently apply the feedback to create a polished, professional cover letter.

I can effectively prepare for and participate in a mock interview to demonstrate my interview skills.

- Level 1: I can recognize basic interview questions and respond with simple answers with support.
- Level 2: I can answer basic interview questions with support and demonstrate basic interview behavior, such as making eye contact.
- Level 3: I can prepare for a mock interview by researching common questions and demonstrating confident answers with appropriate body language.
- Level 4: I can effectively prepare for and participate in a mock interview by practicing responses and using professional language and body language.
- Level 5: I can confidently and effectively participate in a mock interview, demonstrating professionalism and strong interview skills.

I can write a thoughtful and professional thank you note to express appreciation after an interview or meeting.

- Level 1: I can write a basic thank you note with support to express appreciation after an interview or meeting.
- Level 2: I can write a thank you note that includes a basic expression of appreciation after an interview or meeting.
- Level 3: I can write a clear and thoughtful thank you note that expresses appreciation and references specific details from an interview or meeting.
- Level 4: I can write a professional and tailored thank you note that thoughtfully expresses appreciation and reinforces my interest in the position or meeting.
- Level 5: I can write a polished, professional thank you note that effectively expresses appreciation, reinforces my qualifications, and strengthens my candidacy after an interview or meeting.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can effectively search for job opportunities that match my interests, skills, and qualifications.	• I can identify key job search platforms (e.g., Indeed, LinkedIn, local job boards). • I can refine my job search by selecting appropriate filters (location, job type, industry). • I can assess job descriptions to determine if my skills and qualifications match the position.	

		• I can create a list of 3-5 job opportunities to apply for, based on my research.
2	I can complete a job application accurately and thoroughly.	• I can correctly fill out all required fields in a job application, including personal information and work experience. • I can customize my application responses to align with the specific job requirements and demonstrate my skills. • I can check my application for accuracy, ensuring that all information is up-to-date and truthful. • I can submit the job application by following the employer's submission instructions (e.g., online portal, email).
3	I can create a professional resume that highlights my skills, experiences, and qualifications.	• I can format my resume with appropriate headings and sections (e.g., contact information, education, experience). • I can describe my past experiences using clear, action-oriented language and measurable achievements. • I can tailor my resume to emphasize the most relevant skills and experiences for a specific job. • I can proofread and revise my resume to ensure it is free from errors and clearly communicates my qualifications.
4	I can provide constructive peer feedback and apply the feedback to revise my resume effectively.	• I can identify specific strengths in my peer's document and highlight them with clear examples. • I can offer constructive suggestions for improvement, focusing on areas such as clarity, organization, or content relevance. • I can actively listen to the feedback provided by my peer and ask clarifying questions if needed to ensure understanding. • I can use the feedback I receive to revise my resume, making specific improvements based on the suggestions provided.
5	I can write a tailored cover letter that effectively communicates my interest in a job and demonstrates my qualifications.	• I can write a strong introduction that states the position I am applying for and briefly explains why I am a good fit. • I can provide specific examples of my skills and experiences that match the job description. • I can explain why I am interested in the company and how my values align with theirs. • I can conclude with a professional closing, inviting the employer to contact me for an interview, and thank them for their consideration.
6	I can provide constructive peer feedback and apply the feedback to revise my cover letter effectively.	• I can identify specific strengths in my peer's document and highlight them with clear examples. • I can offer constructive suggestions for improvement, focusing on areas such as clarity, organization, or content relevance. • I can actively listen to the feedback provided by my peer and ask clarifying questions if needed to ensure understanding. • I can use the feedback I receive to revise my cover letter , making specific improvements based on the suggestions provided.
7	I can effectively prepare for and participate in a mock interview to demonstrate my interview skills.	• I can prepare for the mock interview by researching the company and role, and by practicing common interview questions.

		• I can introduce myself confidently and answer interview questions with clear, concise, and relevant responses. • I can demonstrate appropriate body language, such as maintaining eye contact and using an engaging tone of voice. • I can reflect on the feedback I receive from the mock interview and set goals for improvement in future interviews.
8	I can write a thoughtful and professional thank you note to express appreciation after an interview or meeting.	• I can begin my thank you note by addressing the recipient appropriately and expressing gratitude for the opportunity. • I can reference specific details from the interview or meeting that highlight my appreciation and reinforce my interest in the role or opportunity. • I can use professional, polite language and maintain a positive, respectful tone throughout the note. • I can conclude the note with a courteous closing that invites further communication and reaffirms my appreciation.

Unit 3: Employability Skills

The Employability Unit will help students to develop their skills in communication, teamwork, communication, attitude, and problem solving. Each of these skills will aid students in entering the workforce while becoming effective employees.

Relevant Standards: Bold indicates priority

NBEA Standards 2023

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):	Enduring Understanding(s):
• How do my strengths, interests, and values influence the types of jobs or careers I am suited for? • What skills do I need to develop to be more effective in the workplace? • How can I identify and improve areas of weakness in my employability skills? • Why is effective communication important in the workplace? • How can I ensure that I communicate professionally in written and verbal forms? • What are qualities of a good team player, and how can I develop those qualities? • How can I demonstrate critical thinking and decision-making in the workplace? • How can I balance multiple responsibilities and tasks at once to ensure workplace success? • What does professionalism look like in the workplace and how can I demonstrate it? • How do ethics and integrity impact my professional reputation and decision-making in the workplace?	• Self-reflection and understanding of personal attributes lead to better career alignment. • The ability to communicate effectively with colleagues, clients, and supervisors is the foundation to career success and advancement. • Effective professionals understand the importance of working together and contributing to a common purpose. • The ability to think logically and make decisions based on evidence and reasoning are essential for professional growth and job performance. • Time management and organizing tasks is critical for career success. • Your attitude, reliability, and commitment impacts your ability to grow in any profession. • The relationships you build both inside and outside of the workplace can open doors for you. • Integrity is the foundation to building trust.
Demonstration of Learning:	**Pacing for Unit**
Self-reflection Class discussions Workplace scenarios	6 Block Periods
Family Overview (link below)	**Integration of Technology:**
Intro to CWE Family Overview Intro to CWE Family Overview - Spanish	Students will use Google Docs to complete journals to self-reflect on the various employability skills.
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Communication, nonverbal communication, verbal communication, interpreting, listening, active listening, problems, solutions, critical thinking, teamwork, positive attitude, enthusiasm, criticism, stress, pressure	N/A

Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Students discuss how we learn soft skills/employability skills throughout their education. Students often make connections to prior experiences working in other classrooms on partner and collaborative work.	• Soft skills/employability skills are not important. • Professionalism only matters in a full-time job. • The skills I have learned in school are enough for a job. • You don't need to build relationships or network. • Once I get a job, I don't need to keep improving my skills. • Time management means multitasking.
Connections to Prior Units:	**Connections to Future Units:**
Students have evaluated themselves in terms of their interests and skills. Students will dive deeper into soft skills/employability skills and continue the self-reflection process to identify areas that they may need to improve on to maintain a job in the future. When students learn about employability skills, they will be able to further refine their cover letter and resume.	N/A

Differentiation through *Universal Design for Learning*

UDL Indicator	**Teacher Actions:**

Engagement

7.1 Optimize choice and autonomy

- Provide options for real-world scenarios (teamwork, professionalism, problem-solving).

7.2 Optimize relevance, value, and authenticity

- Use workplace simulations, team projects, mock interviews, and role-play activities based on student career interests to connect content to real-life employability skills.

8.3 Foster collaboration and community

- Build in frequent structured peer interactions (e.g., think-pair-share, jigsaw, team task roles) during scenarios and group work. Assign rotating roles in group activities to encourage equal participation and accountability.

9.3 Develop self-assessment and reflection

- Use Google Docs journals for students to reflect on progress with employability skills (e.g., attitude, communication). Include reflective prompts such as "How did I handle feedback this week?" or "What skill did I demonstrate in our team project?"

Representation

2.5 Illustrate through multiple media

- Use workplace scenario videos, recorded interviews, diagrams of communication models, and case studies.
- Present lessons using both verbal explanation and visual supports like slides or graphic organizers.

Expression/Action

4.1 Vary the methods for response and navigation

- Offer multiple formats for demonstrating learning: digital journals, presentations, skits, interviews, infographics. Allow students to choose whether to respond orally, in writing, or visually.

Supporting Multilingual/English Learners

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

I can communicate clearly and effectively in both written and verbal forms.

- Level 1: I can understand basic communication strategies and respond with simple words or phrases in written and spoken forms.
- Level 2: I can express simple ideas clearly with some support and begin to communicate in written and spoken forms using short sentences.
- Level 3: I can communicate clearly in written and spoken forms, using simple sentences and paragraphs to share ideas and respond to questions.
- Level 4: I can communicate effectively in both written and spoken forms, adjusting my language and tone for different audiences and purposes.
- Level 5: I can communicate clearly and effectively in a variety of professional and academic settings, using advanced language skills to articulate complex ideas and engage in discussions.

I can work collaboratively with others to achieve a common goal.

- Level 1: I can follow basic instructions and participate in simple group activities with support.
- Level 2: I can contribute simple ideas and work with others to complete a task, asking for help when needed.
- Level 3: I can participate actively in group discussions, share ideas, and contribute to solving problems to achieve a common goal.
- Level 4: I can take on a leadership role or support team members in achieving group goals, offering constructive feedback and collaborating effectively.
- Level 5: I can lead group efforts, facilitate collaboration, and support others in achieving complex goals through effective communication, problem-solving, and conflict resolution.

I can identify problems, analyze possible solutions, and choose the best course of action to solve the problem.

- Level 1: I can recognize simple problems and express my understanding with support.
- Level 2: I can identify problems, suggest solutions, and choose one solution with guidance.
- Level 3: I can identify problems, analyze different solutions, and choose a solution to solve the problem.
- Level 4: I can critically analyze complex problems, consider multiple solutions, and choose the best course of action.
- Level 5: I can independently analyze complex problems, evaluate diverse solutions, and implement the best course of action, demonstrating reflective thinking.

I can maintain a positive, growth-oriented attitude toward challenges and feedback.

- Level 1: I can recognize when I am feeling frustrated and understand that challenges are a part of learning.
- Level 2: I can stay focused on tasks even when they are challenging and listen to feedback.
- Level 3: I can approach challenges with a positive mindset and use feedback to improve my performance.
- Level 4: I can embrace challenges with a growth mindset and demonstrate resilience in the face of setbacks.
- Level 5: I can consistently demonstrate resilience, seek out feedback for growth, and adapt to challenges with a positive attitude.

I can demonstrate professionalism by exhibiting appropriate behavior, communication, and work ethic in various professional settings.

- Level 1: I can follow basic guidelines for behavior and participate in simple tasks in a professional setting with support.
- Level 2: I can demonstrate appropriate behavior and communicate simply and respectfully in a professional setting.
- Level 3: I can consistently exhibit professionalism by showing respect, communicating effectively, and managing my responsibilities independently.
- Level 4: I can handle complex professional situations with poise, demonstrating leadership and a strong work ethic.
- Level 5: I can consistently demonstrate high-level professionalism, influencing others with my communication skills, leadership, and commitment to excellence.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can communicate clearly and effectively in both written and verbal forms.	• I can understand basic communication concepts and give clear responses to direct questions. • I can express ideas clearly in short written or spoken responses, using appropriate vocabulary and sentence structure. • I can communicate ideas and information effectively in both written and spoken forms, tailoring the message to my audience. • I can present complex ideas in a clear and engaging way, using multiple forms of communication (verbal, visual, written) to support my message and connect with the audience.	
2	I can work collaboratively with others to achieve a common goal.	• I can follow directions in a team setting and contribute basic ideas when prompted. • I participate in group activities, listen to others' opinions, and share my thoughts respectfully. • I collaborate actively with others, helping to solve problems, share tasks, and contribute my strengths to the team. • I take on leadership roles in team projects, encouraging collaboration, resolving conflicts, and ensuring all voices are heard to achieve a shared goal.	
3	I can identify problems, analyze possible solutions, and choose the best course of action to solve the problem.	• I can recognize simple problems and understand the need to find a solution. • I can identify potential solutions to problems and choose one that seems reasonable. • I can analyze different solutions to a problem, weigh	

		the pros and cons, and select the best course of action. • I can think critically to solve complex problems, evaluate multiple perspectives, and reflect on the outcome to improve future problem-solving strategies.
4	I can maintain a positive, growth-oriented attitude toward challenges and feedback.	• I can recognize when I am feeling frustrated or challenged and understand the importance of staying calm. • I can manage my emotions in challenging situations and approach new tasks with an open mind. • I approach challenges with a positive mindset, seek constructive feedback, and make an effort to improve. • I demonstrate resilience and persistence in difficult situations, actively seeking ways to grow, learn, and stay motivated, regardless of setbacks.
Ongoing	I can demonstrate professionalism by exhibiting appropriate behavior, communication, and work ethic in various professional settings.	• I can follow basic professional behaviors such as being on time and dressing appropriately for a setting. • I can communicate respectfully with peers and supervisors, and show accountability for my tasks. • I can demonstrate a strong work ethic by completing tasks on time, maintaining a positive attitude, and taking initiative when needed. • I consistently exhibit professionalism by demonstrating effective communication, taking responsibility for my actions, maintaining a high level of integrity, and contributing positively to the workplace culture.

Unit 4: Employment Laws

The Employment Laws Unit will equip students with the basic understanding and knowledge of the legal aspects of our working world. Students will learn about the legal responsibilities for both employers and employees. This knowledge will allow students to make good ethical decisions for themselves and their employers.

Relevant Standards: Bold indicates priority

NBEA Standards 2023

Business Law

1. Basics of the Law
   Analyze the relationship between ethics and law and describe the law's sources, the structure of the court system, different classifications of procedural law, and different classifications of substantive law.
3. Agency and Employment
   Analyze the role and importance of agency law and employment law related to conduct of business in the national and international workplace.

Essential Question(s):	Enduring Understanding(s):
• What laws do employers need to follow? • What are my rights as an employee? • How are laws and ethics similar and different?	• Employment laws are designed to protect workers' rights and fair treatment in the workplace. • Child labor laws exist to ensure that minors can work safely without compromising their education or well-being. • The Fair Labor Standards Act (FLSA) sets national standards for minimum wage, overtime pay, and youth employment. • There are legal limits to the type of work and number of hours minors can perform, especially during school Block Periods. • Workers—including minors—have the right to a safe workplace and are protected under health and safety regulations. • Knowing your rights as a worker helps prevent exploitation and empowers you to report unfair or unsafe conditions. • Minimum wage and labor protections vary by state, and it's important to understand both federal and state-level laws.
Demonstration of Learning:	**Pacing for Unit**
Class Discussions Research Project Written Responses	6 Block Periods
Family Overview (link below)	**Integration of Technology:**
Intro to CWE Family Overview Intro to CWE Family Overview - Spanish	Students will use Google Docs to complete written responses. Students will use Google Slides or Canva to create a slideshow presentation on a labor law.
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Ethics, Laws, HIPAA, FLSA, FMLA, ADA, Sexual Harassment, Labor Laws, Discrimination, Department of Labor, Equal Employment Opportunity, Benefits, Unemployment Insurance, Termination, Wages, Whistleblower Protection, Work Hours, Unions, Consequences, Policies	CT DOL U.S. DOL

Opportunities for Interdisciplinary Connections:	Anticipated misconceptions:
N/A	• Students can work any job that want regardless of age • Students do not have to pay taxes if they are paid in cash • Students can work as many hours as they want OR supervisors can make students work as many hours as they want. • Breaks are not legally required. • Workers must work unpaid if the employer tells them to stay late. • Workers can be fired for refusing to do something unsafe.
Connections to Prior Units:	**Connections to Future Units:**
Students learn about the laws that protect them in their chosen field (Career Readiness).	Students will learn about all laws in this unit while focusing on worker safety and OSHA in the next unit.
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement 7.2 Optimize relevance, value, and authenticity • Provide scenarios or dilemmas students might face at work • Allow students to choose a labor law to research based on their career interest • Connect law concepts to ethics by analyzing real-world cases of labor violations *Representation* 1.2 Offer alternatives for auditory information • Use captioned videos, infographics, and visual charts to explain laws like FMLA, ADA, and FLSA • Include case study videos or animated clips 3.3 Guide Information processing and visualization • Use graphic organizers to compare federal and state laws • Create flowcharts to illustrate how labor laws apply in different work scenarios *Expression/Action* 5.1 Use multiple media for communication • Provide models of past student projects or professional examples • Offer a variety of format options: presentation, video, podcast, or infographic 6.3 Facilitate managing information and resources • Provide students with a checklist or step-by-step research guide • Use tools like Padlet, Wakelet, or Google Keep to help organize sources • Build in daily checkpoints or reflection to self-monitor progress	
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
I can identify and explain the purpose of each of the laws employers must follow. • Level 1: I can name one or two laws that employers must follow with support. • Level 2: I can identify several laws employers must follow and state a basic reason for each. • Level 3: I can identify and explain the purpose of common laws employers must follow (e.g., minimum wage, anti-discrimination). • Level 4: I can identify and thoroughly explain the purpose of a variety of key laws employers must follow, including their impact on the workplace. • Level 5: I can critically analyze the purpose and implications of various employment laws, including recent or complex legislation, and explain how they ensure fair and equitable workplaces. I can explain the difference between unethical and illegal behavior in the workplace. • Level 1: I can recognize that some actions at work are wrong. • Level 2: I can state a simple difference between something that feels wrong and something that breaks the law at work. • Level 3: I can explain that unethical behavior is against moral principles, while illegal behavior violates the law in the workplace. • Level 4: I can clearly explain the nuances between unethical and illegal behavior in various workplace scenarios, providing examples of each. • Level 5: I can analyze complex workplace situations to differentiate between unethical and illegal actions, considering	

the potential consequences of each for individuals and the organization.

I can analyze examples of workplace behaviors to determine if they are ethical and legal.

- Level 1: With support, I can identify if a simple workplace behavior seems right or wrong.
- Level 2: I can determine if a given simple workplace behavior is likely ethical or unethical, and legal or illegal, with some guidance.
- Level 3: I can analyze examples of workplace behaviors and determine if they are ethical and legal, providing basic reasons for my conclusions.
- Level 4: I can analyze a variety of workplace behaviors, including more complex scenarios, and justify whether they are ethical and legal, referencing relevant principles or laws.
- Level 5: I can critically evaluate complex and ambiguous workplace behaviors, considering different ethical frameworks and legal precedents to determine their ethical and legal standing, and articulate my reasoning clearly.

I can analyze a workplace situation and explain the most appropriate response based on legal and ethical considerations.

- Level 1: Given a simple workplace problem, I can identify a possible action to take with support.
- Level 2: I can analyze a basic workplace situation and suggest a response, considering whether it seems right or wrong and if it might break a rule.
- Level 3: I can analyze a workplace situation and explain a response that considers both ethical principles and basic legal requirements.
- Level 4: I can analyze a more complex workplace situation and explain the most appropriate response, justifying my reasoning based on relevant legal and ethical considerations.
- Level 5: I can analyze intricate workplace dilemmas, evaluate various potential responses through both legal and ethical lenses, and justify the most appropriate course of action, considering potential long-term consequences and stakeholder impact.

I can use a variety of modalities to communicate a professional response to a workplace situation.

- Level 1: I can communicate a simple response to a workplace situation using one method (e.g., speaking).
- Level 2: I can communicate a basic professional response to a workplace situation using two different methods (e.g., speaking and writing a short note).
- Level 3: I can use a variety of common modalities (e.g., email, verbal communication) to communicate a professional response to a workplace situation clearly and respectfully.
- Level 4: I can strategically select and use a variety of modalities (e.g., formal letter, email, presentation) to communicate a professional response to different workplace situations, adapting my tone and style as needed.
- Level 5: I can expertly utilize a range of modalities, including digital and collaborative tools, to communicate nuanced and complex professional responses effectively, demonstrating strong communication skills and audience awareness.

I can explain what an employee handbook is.

- Level 1: I can state that an employee handbook is a type of document.
- Level 2: I can say that an employee handbook gives information to employees.
- Level 3: I can explain that an employee handbook is a document that outlines company policies, procedures, and expectations for employees.
- Level 4: I can explain in detail what an employee handbook is, including its purpose for both employees and the employer.
- Level 5: I can critically analyze the role and significance of an employee handbook in defining workplace culture, legal obligations, and employee rights and responsibilities.

I can explain the purpose of an employee handbook.

- Level 1: I can say one reason why a company might have an employee handbook.
- Level 2: I can list a couple of reasons why an employee handbook is important.
- Level 3: I can explain the main purposes of an employee handbook, such as providing guidance, setting expectations, and ensuring consistency.
- Level 4: I can thoroughly explain the various purposes of an employee handbook, including legal compliance, communication of company culture, and outlining employee benefits and responsibilities.
- Level 5: I can evaluate the effectiveness of an employee handbook in achieving its intended purposes and discuss the potential consequences of a poorly developed or implemented handbook.

I can analyze a workplace situation and select the best course of action using the employee handbook.

- Level 1: Given a simple workplace scenario and a relevant section of a handbook, I can identify a possible action.
- Level 2: I can analyze a basic workplace situation and, with the help of an employee handbook, identify a likely course of action.
- Level 3: I can analyze a workplace situation and select the best course of action by referencing relevant policies and procedures in an employee handbook.
- Level 4: I can analyze more complex workplace situations and justify my selection of the best course of action based on a thorough understanding and application of the employee handbook.
- Level 5: I can critically analyze ambiguous workplace situations, evaluate various potential actions in light of the employee handbook, and justify the most effective and appropriate course of action, considering potential interpretations and nuances within the handbook.

I can identify when my workplace rights have been violated.

- Level 1: I can recognize when something at work doesn't feel right or fair.
- Level 2: I can identify a few basic examples of situations that might be unfair or against the rules at work.

- Level 3: I can identify common examples of workplace rights violations related to areas like pay, discrimination, or safety.
- Level 4: I can identify a range of potential workplace rights violations, referencing specific laws or principles that protect employees.
- Level 5: I can critically analyze complex workplace scenarios to identify potential violations of employee rights, demonstrating a nuanced understanding of relevant employment laws and legal protections.

I can explain what to do if my rights are violated.

- Level 1: I can say that I should tell someone if I think my rights have been violated at work.
- Level 2: I can name one or two people or places I could go to if I think my rights have been violated at work.
- Level 3: I can explain some initial steps to take if I believe my workplace rights have been violated, such as documenting the issue and speaking to a supervisor or HR.
- Level 4: I can explain a comprehensive process for addressing workplace rights violations, including internal reporting mechanisms and external resources like regulatory agencies.
- Level 5: I can evaluate different strategies for addressing workplace rights violations, considering the potential benefits and drawbacks of each, and explain how to navigate complex or sensitive situations effectively.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can identify and explain the purpose of each of the laws employers must follow.	• I can name and describe at least 3 key employment laws. • I can explain why each law exists and how it protects employees or employers. • I can give real-life examples or scenarios that show how each law is used in the workplace. • I can compare and contrast at least two employment laws, showing how their purposes are different.	
2	I can explain the difference between unethical and illegal behavior in the workplace.	• I can define the terms “unethical” and “illegal” and explain how they are different. • I can give examples of actions that are unethical but not illegal, and explain why. • I can give examples of actions that are illegal and explain what law they break. • I can explain why it’s important to understand both ethics and the law in the workplace.	
	I can analyze examples of workplace behaviors to determine if they are ethical and legal.	• I can read or hear a workplace scenario and decide if the behavior is legal, illegal, ethical, or unethical. • I can explain my reasoning using laws and ethical principles we've learned in class. • I can use a checklist, chart, or graphic organizer to organize my analysis. • I can suggest how the situation could have been handled in an ethical and legal way.	
3	I can analyze a workplace situation and explain the most appropriate response based on legal and ethical considerations.	• I can identify the legal and ethical issues in a workplace scenario. • I can explain why a certain response is the most appropriate using specific laws and ethical principles. • I can compare possible responses and explain the consequences of each. • I can support my recommendation with clear reasoning and evidence.	
	I can use a variety of modalities to communicate a professional response to a workplace situation.	• I can choose the best format (e.g., written report, presentation, infographic, or video) to clearly communicate my response. • I can use professional language and tone appropriate for the workplace. • I can include key legal and ethical vocabulary to show my understanding. • I can organize my response clearly so others can understand my reasoning and conclusions.	

4	I can explain what an employee handbook is.	• I can define what an employee handbook is in my own words. • I can describe what types of information are usually found in an employee handbook. • I can explain who uses the handbook and why it's important. • I can identify a real or sample employee handbook and point out key sections.
	I can explain the purpose of an employee handbook.	• I can describe how an employee handbook helps both employees and employers. • I can explain how the handbook protects employee rights and sets expectations. • I can give examples of problems that an employee handbook can help solve. • I can explain how an employee handbook supports a positive and fair workplace.
	I can analyze a workplace situation and select the best course of action using the employee handbook.	• I can read a workplace scenario and identify what the issue is (e.g., conflict, attendance, safety). • I can locate the related policy or guideline in the employee handbook. • I can explain why a certain response is the best based on the handbook policy. • I can communicate my decision clearly using evidence from the handbook.
5	I can identify when my workplace rights have been violated.	• I can name key employee rights (e.g., fair pay, a safe workplace, freedom from discrimination). • I can recognize examples of situations that violate these rights. • I can explain which law or policy is being violated in a given scenario. • I can distinguish between a personal disagreement and a legal rights violation.
	I can explain what to do if my rights are violated.	• I can list the steps to take if I believe my rights are being violated (e.g., document the issue, report to HR or a supervisor). • I can name the correct person or agency to report a violation to (e.g., HR, OSHA, Department of Labor). • I can explain the importance of documenting the situation (dates, what happened, who was involved). • I can describe how taking action protects both myself and others in the workplace.

Unit 5: Worker Safety

The Job Safety Unit is designed to ensure students understand the basics of worker safety, OSHA, and workers compensation. Students will be able to use this information to make safe and healthy decisions for themselves and their colleagues.

Relevant Standards: Bold indicates priority

NBEA Standards 2023

Business Law

1. Basics of the Law
   Analyze the relationship between ethics and law and describe the law's sources, the structure of the court system, different classifications of procedural law, and different classifications of substantive law.
3. Agency and Employment
   Analyze the role and importance of agency law and employment law related to conduct of business in the national and international workplace.

Essential Question(s):	**Enduring Understanding(s):**
• What regulations must employers follow for safety? • What is my role/rights in a safe and healthy environment?	• OSHA regulations laws to promote a safe and healthy work environment. • Each worksite has different safety regulations aligned with OSHA Standards. • Employers have policies in place for how to handle workplace emergencies. • Employers and employees both have roles to maintain the health and safety of the workplace environment. • Personal Protective Equipment is extremely important. • Each organization has its own procedures for safety and health based on OSHA guidelines. • If you are injured on the job, you are entitled to worker's compensation. • If you think the employer is not following OSHA, you can report it.
Demonstration of Learning:	**Pacing for Unit**
Class Discussions surrounding Case Studies Written Responses	4 Block Periods
Family Overview (link below)	**Integration of Technology:**
Intro to CWE Family Overview Intro to CWE Family Overview - Spanish	Students will use Google Docs to complete their written responses about worker safety.
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Safety, OSHA, Emergency, Rules, Procedures, Personal Protective Equipment (PPE), Policies, Worker's Compensation,	CT OSHA Federal OSHA
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Discussion of how OSHA & safety is involved in the school, science classes, etc.	• Safety is only a concern for people working in dangerous or physical jobs. • If I'm not injured or affected immediately, there's no need to report a safety hazard. • Employers are only responsible for safety during working hours. • I don't have to report a safety issue unless I am personally hurt. • Safety regulations are optional and employers can choose whether or not to follow them. • If I report a safety issue, my employer can retaliate or fire me • Safety equipment and training are only necessary for certain

	high-risk jobs. • If an accident happens at work, the employer is always to blame.
Connections to Prior Units:	**Connections to Future Units:**
Connects to employment law unit in which OSHA was introduced	N/A
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement 7.2 Optimize relevance, value, and authenticity • Use case studies of real workplace accidents and safety violations to make the lesson relevant. • Incorporate examples of safety regulations from various industries (e.g., construction, healthcare, office environments) to show the broad applicability of worker safety. 7.3 Minimize threats and distractions • Create a safe classroom environment where all students feel comfortable asking questions or voicing concerns about worker safety. • Ensure that all students have access to materials in various formats, minimizing potential barriers to learning. *Representation* 1.1 Provide multiple means of representation • Provide visual charts, infographics, and diagrams to explain OSHA regulations, workplace safety protocols, and workers' compensation. • Use captioned videos and animated examples to demonstrate workplace safety procedures. • Present real-world case studies and safety violations to illustrate the importance of workplace safety and regulations. 1.2 Offer alternatives for auditory information • Provide written summaries of safety regulations for students who may struggle with listening to long audio or video content. 1.3 Provide options for comprehension • Offer clear and simple definitions for complex terms like “OSHA,” “PPE,” and “worker’s compensation.” • Break down safety protocols into smaller, digestible steps. 3.1 Guide Information processing and visualization • Use graphic organizers (e.g., flowcharts, Venn diagrams) to help students compare and contrast different safety procedures and regulations. • Provide checklists for students to follow as they analyze safety situations, such as identifying hazards, assessing risks, and reporting issues. 3.2 Support planning and strategy development • Encourage students to create action plans for handling workplace safety issues, using both written and digital formats (e.g., Google Docs, Padlet, or Wakelet). • Teach students to use decision-making frameworks for analyzing safety situations, such as pros/cons or risk-benefit assessments. *Expression/Action* 5.1 Use multiple media for communication • Allow students to demonstrate understanding through a variety of formats: oral presentations, written reports, infographics, or videos. • Provide scaffolding for creating a safety plan or responding to a safety concern through templates or sample documents. 6.3 Facilitate managing information and resources • Offer tools like Google Keep or Padlet for students to organize resources, case studies, or safety reports for easy access and review. • Provide structured step-by-step guides for writing reports or performing safety audits.	
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
I can understand how to read OSHA guidelines for workplace health and safety. • Level 1: I can recognize that OSHA has information about staying safe at work. • Level 2: I can identify basic parts of an OSHA guideline (e.g., headings, lists). • Level 3: I can locate specific information within an OSHA guideline and understand basic instructions related to	

workplace health and safety.
- Level 4: I can read and interpret OSHA guidelines relevant to a specific task or industry, explaining the key requirements and recommendations.
- Level 5: I can critically analyze and synthesize information from various OSHA guidelines, understanding the legal implications and applying them to complex workplace scenarios.

I can identify and explain the importance of safety regulations.
- Level 1: I can name one reason why having rules at work might be important.
- Level 2: I can identify a few examples of safety regulations and state a simple reason why they are needed.
- Level 3: I can identify and explain the importance of common safety regulations in preventing accidents and injuries in the workplace.
- Level 4: I can explain the broader importance of safety regulations in creating a safe and healthy work environment, including legal and ethical considerations.
- Level 5: I can analyze the impact of safety regulations on workplace culture, productivity, and legal liability, and advocate for their importance in diverse professional settings.

I can research OSHA safety regulations for my career of interest.
- Level 1: I can name one place where I might find information about safety for a job.
- Level 2: I can locate some OSHA information that might be relevant to a job I am interested in.
- Level 3: I can research and identify specific OSHA safety regulations that are relevant to my career of interest.
- Level 4: I can thoroughly research and explain the OSHA safety regulations that are most critical for my career of interest, including specific standards and best practices.
- Level 5: I can independently research, analyze, and synthesize complex OSHA regulations relevant to my career of interest, evaluating their impact and identifying areas for proactive safety measures.

I can explain the importance of Personal Protective Equipment (PPE).
- Level 1: I can name one type of equipment that people wear to stay safe at work.
- Level 2: I can explain a basic reason why people might need to wear PPE at work.
- Level 3: I can explain the importance of PPE in protecting workers from specific hazards in the workplace.
- Level 4: I can explain in detail the importance of selecting, using, and maintaining appropriate PPE to minimize workplace risks and injuries.
- Level 5: I can critically evaluate the role of PPE in a comprehensive safety program, considering its limitations and the importance of other hazard control measures.

I can review OSHA guidelines for PPE for my career of interest.
- Level 1: I can recognize that OSHA has information about things people wear to stay safe at work.
- Level 2: I can locate some basic information about PPE on the OSHA website or in OSHA materials.
- Level 3: I can review OSHA guidelines related to PPE that are relevant to my career of interest and identify general recommendations.
- Level 4: I can thoroughly review and interpret specific OSHA guidelines for PPE relevant to the hazards present in my career of interest, including selection, use, and maintenance requirements.
- Level 5: I can critically analyze and synthesize information from various OSHA PPE guidelines relevant to my career of interest, evaluating their effectiveness and identifying best practices beyond the minimum requirements.

I can describe the PPE required for a given scenario to ensure safety.
- Level 1: Given a simple picture of a work situation, I can point to something someone is wearing for safety.
- Level 2: Given a basic work scenario, I can name one piece of PPE that might be needed.
- Level 3: Given a specific workplace scenario, I can describe the essential PPE required to address the identified hazards and ensure safety.
- Level 4: Given a more complex workplace scenario with multiple hazards, I can describe the combination of PPE needed and explain why each piece is necessary for comprehensive safety.
- Level 5: Given a detailed and potentially hazardous workplace scenario, I can analyze the risks and prescribe a comprehensive set of PPE, justifying my choices based on OSHA guidelines and best safety practices.

I can explain the role of the employer & employee in maintaining workplace safety.
- Level 1: I can state one thing that a boss might do to keep workers safe.
- Level 2: I can state one thing that a worker should do to stay safe at work.
- Level 3: I can explain the basic roles and responsibilities of both employers and employees in maintaining a safe workplace.
- Level 4: I can thoroughly explain the distinct yet interconnected roles of employers (e.g., providing training, ensuring safe conditions) and employees (e.g., following procedures, reporting hazards) in creating and maintaining a strong safety culture.
- Level 5: I can analyze the shared responsibility model of workplace safety, evaluating the effectiveness of employer and employee contributions and identifying strategies for enhancing collaboration in promoting a safe environment.

I can explain my rights as an employee in regard to workplace safety.
- Level 1: I can say that workers have the right to be safe at work.
- Level 2: I can name one or two basic rights that employees have related to safety at work.
- Level 3: I can explain some key rights that employees have regarding workplace safety, such as the right to a safe workplace, training, and reporting hazards.
- Level 4: I can thoroughly explain a range of employee rights related to workplace safety under OSHA, including the right

to information, participation, and protection from retaliation.
- Level 5: I can critically analyze and articulate the full scope of employee rights regarding workplace safety, including the legal basis for these rights and how employees can exercise them effectively.

I can identify when a workplace situation (safety) needs to be reported and the channels required for completing the report.

- Level 1: I can say that if something looks dangerous at work, you should tell someone.
- Level 2: I can identify a few examples of unsafe situations at work that should be reported.
- Level 3: I can identify common workplace safety hazards that need to be reported and explain the typical channels for reporting them (e.g., supervisor, safety officer).
- Level 4: I can identify a variety of workplace safety situations that require reporting, including imminent dangers, injuries, and potential hazards, and explain the appropriate internal and external reporting procedures.
- Level 5: I can analyze complex workplace scenarios to determine when a safety issue necessitates reporting, understand the legal obligations for reporting, and navigate various reporting channels effectively, including emergency procedures and OSHA reporting requirements.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can understand how to read OSHA guidelines for workplace health and safety.	• I can identify and explain the main sections of OSHA guidelines (e.g., standards, regulations, and safety protocols). • I can accurately interpret OSHA terminology and use it to understand specific workplace safety regulations. • I can explain how to apply OSHA safety regulations to different workplace environments. • I can find specific OSHA guidelines related to a particular industry or safety concern using available resources.	
	I can identify and explain the importance of the safety regulations.	• I can describe the purpose of OSHA regulations in ensuring workplace health and safety. • I can explain how following safety regulations helps prevent workplace accidents and promotes well-being. • I can explain the consequences of not following safety regulations for both employers and employees. • I can connect OSHA regulations to broader legal and ethical standards in the workplace.	
	I can research OSHA safety regulations for my career of interest.	• I can identify OSHA regulations relevant to my career field by researching industry-specific guidelines. • I can analyze the specific safety requirements needed for my chosen career and explain why they are important. • I can apply OSHA regulations to a potential workplace situation within my career of interest. • I can summarize and present my findings on OSHA regulations related to my career, highlighting the most important rules and standards for safety.	
2	I can explain the importance of Personal Protective Equipment (PPE).	• I can define what Personal Protective Equipment (PPE) is and explain its role in maintaining safety at the workplace. • I can describe how PPE reduces the risk of injury and exposure to workplace hazards. • I can explain different workplace scenarios where PPE is required and how it contributes to a safer environment. • I can identify and explain the different types of PPE, including gloves, helmets, goggles, and respirators, and their specific purposes.	
	I can review OSHA guidelines for PPE for my career of interest.	• I can locate and review OSHA guidelines for PPE related to my specific career or industry. • I can explain why it is important for employers and employees to comply with OSHA PPE regulations in my career of interest. • I can identify workplace hazards in my career field and explain which PPE is recommended or required to protect against these risks.	

		• I can summarize the key OSHA regulations regarding PPE in my career field and explain how they help ensure worker safety.
	I can describe the PPE required for a given scenario to ensure safety.	• I can assess a given workplace scenario and identify the appropriate PPE required for that specific environment or task. • I can explain how each piece of PPE in a given scenario works to protect the worker from specific hazards (e.g., chemical spills, falling objects, respiratory risks). • I can match specific types of PPE (e.g., gloves, helmets, safety glasses) to common workplace hazards presented in a scenario. • I can justify my choice of PPE for a scenario by explaining how it addresses the identified safety risks and complies with OSHA regulations.
3	I can explain the role of the employer & employee in maintaining workplace safety.	• I can clearly identify and describe the specific responsibilities employers have (e.g., providing PPE, training, maintaining a safe work environment) and the responsibilities of employees (e.g., following safety procedures, reporting hazards). • I can provide accurate real-world examples of how both employers and employees contribute to a safe workplace. • I can explain how laws and OSHA regulations define the legal roles of both employers and employees in promoting safety. • I can explain how cooperation between employers and employees creates a safer work environment and why shared responsibility is important for injury prevention and overall workplace health.
4	I can explain my rights as an employee in regard to workplace safety.	• I can list my basic safety rights under OSHA, including the right to a safe workplace, to receive safety training, and to report hazards without retaliation. • I can explain how laws like OSHA protect workers from unsafe conditions and what legal protections exist if those rights are violated. • I can provide examples of situations where an employee's safety rights are being upheld or violated. • I can compare my rights as an employee to the legal responsibilities employers have in ensuring workplace safety.
	I can identify when a workplace situation (safety) needs to be reported and the channels required for completing the report.	• I can identify various safety violations or hazardous conditions that require reporting (e.g., blocked emergency exits, lack of PPE, chemical spills). • I can describe the correct process for reporting a safety issue, including who to report to (e.g., supervisor, OSHA, HR) and what information should be included. • I can identify the tools and resources available for reporting (e.g., OSHA hotline, online complaint forms, internal reporting systems). • I can explain that I am protected from retaliation for reporting a workplace safety concern and describe the steps to take if retaliation occurs.

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Construction Technology	CTE	9-12	0.5 (Half-Year Course)

Course Description:

This course introduces students to the fundamental principles and practices of the construction industry. Through hands-on projects and classroom instruction, students will explore residential, commercial, and civil construction techniques, materials, tools, and safety protocols. Emphasis is placed on blueprint reading, site preparation, framing, electrical, plumbing, and finish work. Students will also learn about construction math, project planning, sustainability, and career pathways in the skilled trades. This course prepares students for further study in construction-related fields and develops essential skills for entry-level employment or technical certification.

Aligned Core Resources:	Connection to the ***BPS Vision of the Graduate***
CCTC Standards (CTE)	CONTENT MASTERY • Develop and draw from a baseline understanding of knowledge in academic disciplines from our Bristol curriculum. CRITICAL (THINKING AND PROBLEM SOLVING • Collect, assess and analyze relevant information • Reason effectively. Use systems thinking. • Make sound judgments and decisions. Identify, define and solve authentic problems and essential questions. • Reflect critically on learning experience, processes and solutions. • Transfer knowledge to other situations.
Additional Course Information: ***Knowledge/Skill Dependent courses/prerequisites***	**Link to *Completed Equity Audit***
None	Construction Technology - Equity Curriculum Review (2025)

Standard Matrix

Standard	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
CCTC - AC - Use vocabulary, symbols and formulas common to architecture and construction.	X				X	X
CCTC - AC - Comply with regulations and applicable codes to establish and manage a legal and safe workplace.	X	X		X		
CCTC - AC-Apply practices and procedures required to maintain jobsite safety.	X					
CCTC - AC - Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	X		X			
CCTC- AC- Describe contractual relationships between all parties involved in the building process.		X				
CCTC -AC- Describe the approval procedures required for successful completion of a construction project.		X				
CCTC - AC - Justify design solutions through the use of research documentation and analysis of data.			X			
CCTC - AC- Demonstrate the construction crafts required for each phase of a construction project.				X	X	X

CCTC - AC- Read, interpret and use technical drawings, documents and specifications to plan a project.					X	X
CCTC - AC- Compare and contrast the building systems and components required for a construction project.					X	X
CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals					X	
CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.						X
CCTC - AC - Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.						X

Unit Links

Unit 1: Measurement/ Safety
Unit 2: Construction Lifecycle/ Zoning/ Building Codes
Unit 3: Loads on Structures
Unit 4: Foundations
Unit 5: Residential Framing
Unit 6: Systems

Unit Title:	
Unit 1: Measurement/Safety	
Relevant Standards: Bold indicates priority	
CCTC - AC - Use vocabulary, symbols and formulas common to architecture and construction. CCTC - AC - Comply with regulations and applicable codes to establish and manage a legal and safe workplace. CCTC - AC - Apply practices and procedures required to maintain jobsite safety. CCTC - AC - Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	
Essential Question(s):	**Enduring Understanding(s):**
• Can you measure to the nearest 1/16 of an inch? • How is incorporating safety important inside and outside the laboratory?	• Learning how to measure properly is a skill that is beneficial in everyday life. • Safety is a top priority in whatever you do. • Tool and machine safety keeps everyone safe.
Demonstration of Learning:	**Pacing for Unit**
Formative and summative assessments	5 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	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, OSHA, SDS/MSDS, PPE, Z87	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. • Safety knowledge can be important for other lab based courses such as Science.	• Students may struggle with reading a ruler and understanding what each mark means on a ruler. • Eyewear is not important • Injuries will not happen to me
Connections to Prior Units:	**Connections to Future Units:**
N/A	Students will be using measurements throughout the course on various projects while utilizing the safety procedures discussed in class.
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Representation • Use visual demonstrations (e.g., videos, live measuring demos, color-coded rulers) to show how to read various measurement tools (tape measures, calipers, micrometers). • Post illustrated safety posters and diagrams around the shop for common tools and procedures. • Provide bilingual safety signage or translated safety contracts for ELL students. • Offer written and audio safety instructions and allow students to replay them as needed. Action and Expression • Let students demonstrate measurement skills through hands-on practice, digital simulations, or video walkthroughs of their work. • Provide flexible tools: large-print measuring tapes, digital calipers, or rulers with tactile markers for students with visual or motor challenges. • Use scaffolded checklists or task cards for practicing step-by-step tool use and safety procedures. • Allow students to present safety procedures via poster, skit, or infographic. Engagement • Gamify safety and measurement with challenges (e.g., "Measurement Relay" or "Spot the Safety Violation"). • Use real-world construction or manufacturing examples to highlight relevance. • Give students a voice by letting them create classroom safety rules or a peer safety contract. • Celebrate milestone achievements (e.g., "Measuring Mastery" or "Tool Safety Champion")	

Supporting Multilingual/English Learners						
Related *CELP standards* aligned to Learning Targets:						
CELP Level	**LT 1**	**LT 2**	**LT 3**	**LT 4**	**LT 5**	**LT 6**
Emerging	I can identify whole inches and some marks on a ruler.	I can match or name simple fractions like ½ or ¼.	I can name PPE items (gloves, goggles) and say what they protect.	I can say OSHA helps keep workers safe.	I can follow rules like not touching wires and wearing gloves.	I can name things that make a workspace safe (clean, organized, signs).
Expanding	I can independently and accurately measure to the nearest 1/16" using standard tools.	I can independently reduce any fraction related to measurement or construction.	I can explain how PPE reduces risk, and connect it to specific tasks and hazards.	I can explain how OSHA enforces safety and give examples of its impact on job sites.	I can apply and explain electrical safety procedures in different worksite situations.	I can evaluate a workspace for hazards and explain how to maintain a safe environment.
Bridging	I can measure to the nearest 1/4, 1/8, and 1/16 inch with guidance.	I can reduce common fractions to lowest terms with some support.	I can describe why workers wear PPE and give examples of when to use it.	I can describe what OSHA does (rules, inspections, training).	I can explain why it's important to turn off power and use the right tools.	I can describe what makes a work area safe and how to fix unsafe conditions.

Lesson Sequence	Learning Target	Success Criteria/Assessment
1-5	I can accurately measure to the nearest 1/16th of an inch.	• 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. • I can transfer accurate measurements onto wood for cutting, drilling, or assembling
1-5	I can accurately reduce fractions as necessary.	• I can identify when a fraction can be simplified. • I can simplify fractions in woodworking measurements (e.g., reducing 8/16 to 1/2 inch).
1-5	I can explain the purpose of PPE	• I can name different types of PPE to protect the five senses • I can name appropriate PPE types to protect each of the human senses
1-5	I explain the purpose of OSHA in the workplace	• I can explain the purpose of the organization. • I can explain how OSHA uses training and fines to encourage workplace safety
1-5	I can apply rules and guidelines of safe electrical usage	• I can explain what the guidelines are for electrical usage. • I can apply safe electric usage rules to a factory setting.
1-5	I can explain what a safe work environment may look like	• I can explain the importance of lighting and a clean workplace • I can explain the importance of appropriate ventilation in the workplace • I can use safe work practices when working with tools, materials and machines

Unit Title:
Unit 2: Construction Life Cycle/Zoning/Building Codes
Relevant Standards: Bold indicates priority
CCTC- AC- Describe contractual relationships between all parties involved in the building process. CCTC -AC- Describe the approval procedures required for successful completion of a construction project. CCTC - AC-Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

Essential Question(s):	**Enduring Understanding(s):**
• What is the process to build a structure on a piece of land? • What are zoning codes and building codes?	• The student will be able to understand the process to build a structure from start to finish. • Students will understand the importance of zoning and building codes.
Demonstration of Learning:	**Pacing for Unit**
Formative and Summative Assessments	7 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Zoning Codes Building Codes Fire Codes International Building Codes (IBC) Permit Inspection Occupancy Egress	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
N/A	• Structures can be placed wherever someone wants. • There are no guidelines as to what can be built and where it can be built.
Connections to Prior Units:	**Connections to Future Units:**
Measurement may be incorporated into projects such as the zoning activity.	Students will use their understanding of building codes and zoning codes when working on future projects that involve electrical, plumbing and HVAC.

Differentiation through *Universal Design for Learning*
UDL Indicator & Teacher Actions
Representation • Present code and zoning content using diagrams, videos, real-world case studies, and physical blueprints. • Use color-coded overlays or graphic organizers to help students interpret zoning maps. • Offer text-to-speech or translated versions of code documents for ELL and struggling readers. • Invite a local code inspector or zoning official for a guest Q&A or virtual tour. Action and Expression • Allow students to demonstrate understanding through a variety of assessments (e.g., drawing a compliant building plan, oral presentation, digital project). • Offer scaffolded templates for writing a zoning variance request or permit application. • Facilitate group projects where roles are assigned based on student strengths (e.g., researcher, designer, presenter). • Include a build challenge where students apply codes to a scale model or virtual simulation. Engagement

- Connect the unit to students' communities by researching local zoning disputes or upcoming developments.
- Offer choices in project topics (e.g., residential vs. commercial code focus).
- Acknowledge career relevance by linking content to construction, engineering, urban planning, and legal professions.

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3	LT 4
Emerging	I can say why codes are used (keep people safe, control where buildings go).	I can name some code words (permit, zone, setback).	I can find where a code is used on a plan.	I can list the steps of building (plan, build, inspect).
Expanding	I can explain how zoning and building codes protect people and guide community planning.	I can correctly use building code vocabulary when explaining or writing about regulations.	I can apply multiple codes to assess or design a realistic building plan.	I can explain how zoning and building codes apply throughout the full construction life cycle.
Bridging	I can describe how codes help make buildings safe and organized.	I can use code words in sentences and match them to definitions.	I can check if a simple plan follows codes.	I can describe what happens in each stage and when codes are used.

Lesson Sequence	Learning Target	Success Criteria/Assessment
1-2	I can explain the purpose and importance of building and zoning codes.	• I can describe at least two reasons why building codes exist (e.g., safety, public health). • I can give examples of how zoning affects what can be built in a specific area. • I can identify the differences between building codes and zoning regulations.
3-4	I can identify and use key vocabulary related to codes and zoning.	• I can correctly define terms such as "setback," "permit," "egress," and "variance." • I can use the terms in discussion or in writing to explain a zoning scenario. • I can match vocabulary to real-world examples or images.
5-6	I can apply zoning and building codes to evaluate or create a building plan.	• I can read a basic zoning map and identify land use zones. • I can determine if a building design complies with zoning and code requirements. • I can suggest modifications to a plan to bring it into compliance.
7	I can describe the stages of the construction life cycle and their relationship to codes and zoning.	• I can list and explain the main phases of the construction life cycle (planning, design, permitting, construction, inspection, and occupancy). • I can describe how zoning and building codes influence decisions at each stage. • I can explain who is responsible for code compliance during each phase (e.g., architect, contractor, inspector).

Unit Title:	
Unit 3: Loads on Structures	
Relevant Standards: Bold indicates priority	
CCTC - AC - Justify design solutions through the use of research documentation and analysis of data. CCTC - AC - Apply the techniques and skills of modern drafting, design, engineering and construction to projects.	
Essential Question(s):	**Enduring Understanding(s):**
• How do forces which act upon a structure dictate how a structure is built?	• Understanding how different types of loads react on a structure will be a primary reason for selecting a specific construction style
Demonstration of Learning:	**Pacing for Unit**
• Written documents • Student created projects which implement theory • Summative assessment	8 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Compression, tension, deflection , sheer, stability, forces, loads (live, dead, uniform, concentrated)	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Forces and how they react on an object can be important for other lab based courses such as Science or Physics.	Building a structure out of a stronger material rather than utilizing engineering theory will keep structures safe for it occupants
Connections to Prior Units:	**Connections to Future Units:**
Students will be able to implement the theory of how forces act upon a structure to build examples of residential framing	This will be the basis for residential framing techniques
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Start with case studies or videos showing bridge collapses, skyscraper designs, or earthquake-proof buildings to hook interest. • Include culturally relevant examples (e.g., bamboo structures in Asia, adobe buildings in the Southwest). • Allow students to choose the type of structure they want to analyze (e.g., bridges, towers, homes). • Gamify parts of the lesson with structural design challenges (e.g., penny bridge and West Point Bridge Design challenges) . • Use group activities where students take on engineering roles and design structures that must withstand specific loads. Representation • Diagrams, infographics, and animations showing different load types (dead, live, wind, seismic). • Interactive simulations of load forces using online tools like PhET or SketchUp. • Use simple materials (e.g., balsa wood, string, clay) to demonstrate load distribution. • Create comparison charts for different construction styles (e.g., truss vs. arch vs. cantilever). • Provide vocabulary glossaries and visuals for ELL and IEP students. • Use closed captioning and transcripts for video materials. Action and Expression • Use guided templates or step-by-step design journals. • Offer sentence starters and checklists for writing or presenting. • Let students use design software (like West Point Bridge Design) to simulate load effects. • Include accessibility tools like screen readers or speech-to-text for diverse learners.	

Supporting Multilingual/English Learners			
Related *CELP standards* aligned to Learning Targets:			
CELP Level	**LT 1**	**LT 2**	**LT 3**
Emerging	I can name types of loads (dead load, live load, wind).	I can say loads can make a structure bend, break, or fall.	I can look at a model and say if it looks strong or weak.
Expanding	I can explain multiple types of loads and how they act on parts of a structure.	I can explain how engineers design for load distribution and balance to ensure stability.	I can analyze a design using load concepts and explain how to improve it for safety and efficiency.
Bridging	I can describe what each load is and give a simple example.	I can describe how designers change a structure to handle different loads.	I can tell if a design works well or needs changes to support loads.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1-2	I can identify different types of loads that act on structures.	• I can define and give examples of dead loads, live loads, environmental loads (e.g., wind, snow, seismic). • I can visually identify loads in real structures or diagrams. • I can classify loads correctly based on their source and behavior.	
3-4	I can explain how loads affect the design and stability of a structure.	• I can describe how different loads transfer through structural elements (e.g., beams, columns, foundations). • I can explain why accounting for all loads is critical to structural safety. • I can discuss what might happen if a structure is not designed to withstand certain loads.	
5-8	I can evaluate structural designs for load efficiency and safety.	• I can identify structural components that carry specific types of loads. • I can critique a simple design and suggest improvements for load management. • I can explain how load paths influence the strength and stability of a structure.	

Unit Title:	
Unit 4: Foundations	
Relevant Standards: Bold indicates priority	
CCTC -AC- Demonstrate the construction crafts required for each phase of a construction project. CCTC-AC- Comply with regulations and applicable codes to establish and manage a legal and safe workplace.	
Essential Question(s):	**Enduring Understanding(s):**
Why is the foundation an important part of the overall structure?	All forces within a structure are transmitted in a top down fashion to the foundation which ultimately transmits it into the earth
Demonstration of Learning:	**Pacing for Unit**
Formative and Summative Assessments	3 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Foundation Load Shallow Foundation Deep Foundation Slab on Grade Footing Frost Line Crawl Space Rebar Forming Concrete Curing	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
• Safety knowledge can be important for other lab based courses such as Physics.	• Foundations do not need to go that deep. • All soil can support a building the same way. • A foundation will last forever.
Connections to Prior Units:	**Connections to Future Units:**
Foundations are the end of the line when forces are transferred from the various parts of a structure into the ground	A foundation acts as the initial building block for the framing for a structure (residential, commercial, or civil engineering structure)
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Use labeled diagrams, 3D models, and animations showing load paths in structures. • Utilize color-coded arrows to represent different types of forces (compression, tension, shear). • Use small physical models (e.g., Jenga blocks, foam board trusses) to show how forces move. • Create anchor charts with terms like "load," "foundation," "compression," and "distribution." • Use scaffolded note-taking sheets to map forces through structures. Representation • Use group design challenges (e.g., design a simple tower to withstand weight). • Use low-stakes exit tickets, Socratic questioning, or peer reviews to assess understanding regularly. • Allow use of CAD tools or AR apps to virtually dissect buildings and visualize internal forces. Action and Expression • Pose a design challenge: “How would you build a foundation for a structure in an earthquake zone?” • Connect to student interests (e.g., sports stadiums, roller coasters, treehouses). • Incorporate a simulation game where students must balance a budget while ensuring structural integrity.	

- Bring in a local architect or engineer (in-person or virtually) to explain how foundations are designed.
- Encourage students to keep a design journal to track their process and understanding of force flow.

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3
Emerging	I can say foundations hold up buildings.	I can name types like slab, crawlspace, and basement.	I can say soil and weather change how foundations are built.
Expanding	I can explain the structural role of foundations in distributing loads and preventing movement.	I can compare foundation types and explain why one may be chosen over another for a specific project.	I can explain how soil composition, moisture, and climate influence foundation depth, material, and design.
Bridging	I can describe how foundations support weight and keep buildings stable.	I can describe features of different foundation types and when they're used.	I can describe how different soils or weather need different types of foundations.

Lesson Sequence	Learning Target	Success Criteria/ Assessment	Resources
1	I can describe the purpose and function of a building foundation.	• I can explain how foundations support structures and distribute loads to the ground. • I can describe the relationship between the structure, the soil, and the foundation. • I can identify at least two consequences of poor foundation design or construction.	
2	I can identify and compare different types of foundations.	• I can define and distinguish between shallow foundations (e.g., slab, footing) and deep foundations (e.g., piles, caissons). • I can match different types of foundations to appropriate building scenarios. • I can list the pros and cons of at least two types of foundations.	
3	I can explain how soil and environmental conditions affect foundation design.	• I can describe how soil type, moisture, and the frost line influence foundation depth and type. • I can explain what "bearing capacity" means and why it matters. • I can identify environmental factors (e.g., water table, earthquakes) that must be considered when building a foundation.	

Unit Title:	
Unit 5: Residential Framing	
Relevant Standards: Bold indicates priority	
CCTC - AC- Use vocabulary, symbols and formulas common to architecture and construction. CCTC - AC- Read, interpret and use technical drawings, documents and specifications to plan a project. CCTC - AC- Compare and contrast the building systems and components required for a construction project. CCTC - AC- Demonstrate the construction crafts required for each phase of a construction project. CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.	
Essential Question(s):	**Enduring Understanding(s):**
How has the design of a residential structure changed as a result of building codes, green architecture and a new generation of composite materials	Specific components are used in specific manner in residential framing to create floors, walls and roofing assemblies
Demonstration of Learning:	**Pacing for Unit**
• Written documents • Student created project demonstrating culmination of knowledge from unit • Formative and summative assessment	9 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Post and Beam, stick framing, joist, header, stud, jack stud/ trimmer, king stud, sill, sole plate, top plate, double top plate,	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Placement of components will require precise location requiring not only the use of measurement, but math such as geometry and/ or algebra.	Materials are randomly assembled and the framing techniques are different from structure to structure
Connections to Prior Units:	**Connections to Future Units:**
Along with safety and economic considerations, the manner which forces travel through a structure dictate modern construction techniques	The planning for the framing of a residential structure has to account for building systems which will be added later in the construction process such as HVAC, electrical and plumbing
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Begin with a virtual tour or video walkthrough of a house under construction. • Use local building codes or blueprints from community projects to relate content to their world. • Let students choose which system to explore first (floor, wall, or roof). • Offer role-based group tasks: "framing contractor," "building inspector," "apprentice." • Present a problem: “You’ve been hired to frame a tiny home with a flat roof. What components do you need, and how do you use them?” Representation • Diagrams of framing assemblies with labeled components (joists, studs, rafters, headers). • Color-coded framing plans and 3D models. • Use scale models or building kits to physically assemble sections of walls, floors, or roofs. • Introduce framing software (e.g., Chief Architect, SketchUp). • Use interactive simulations or augmented reality to explore how components connect. • Vocabulary lists with visuals.	

- Framing flow charts that show sequencing from subfloor to roof ridge.

Action and Expression

- Build a small wall section or roof truss using real or model materials.
- Create a time-lapse video of their construction process with voice-over explanations.
- Label diagrams of framed structures.
- Write a step-by-step process for assembling a framing system.
- Use software to virtually frame a basic residential floor plan.
- Submit screenshots and explanations of where each component is used and why.
- Journals: “What framing component do you think is most important and why?”
- Exit ticket: “Name one way wall and roof framing differ.”

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3	LT 4
Emerging	I can name parts like studs, joists, and plates.	I can say framing holds up the building.	I can measure and place studs with help.	I can wear PPE and listen to safety instructions.
Expanding	I can explain the function of each component in a wall, floor, or roof framing system.	I can explain how framing elements transfer loads through the structure to the foundation.	I can follow plans accurately and assemble framing using correct spacing and sequence.	I can follow safety rules and use tools carefully.
Bridging	I can describe where framing parts go and what they do.	I can describe how framing helps spread out the building’s weight.	I can measure, mark, and assemble framing with some guidance.	I can model safe behavior, identify hazards, and explain why safety procedures are important.

Lesson Sequence	Learning Target	Success Criteria/ Assessment
1	I can identify and describe the basic components of residential framing.	• I can correctly name framing parts such as **stud**, **joist**, **plate**, **header**, **truss**, and **rafter**. • I can describe the purpose and placement of each component. • I can label a wall, floor, and roof framing diagram accurately.
2	I can explain how framing supports the structure and distributes loads.	• I can describe how vertical loads transfer from the roof through walls to the foundation. • I can explain the role of sheathing, bracing, and fasteners in structural stability. • I can identify framing elements that resist lateral (sideways) forces, like wind or seismic activity.
3	I can follow proper procedures to layout and assemble framing components.	• I can use measuring and marking tools accurately for stud spacing (e.g., 16" or 24" on center). • I can explain or demonstrate how to build a framed wall or floor section using correct techniques. • I can follow a framing plan or blueprint with minimal guidance.
4	I can apply safety practices when working on or around framing structures.	• I wear proper PPE (e.g., safety glasses, gloves) and follow tool safety rules. • I recognize hazards such as pinch points, unstable frames, or tripping hazards. • I follow team communication protocols and lift/carry materials safely.

Unit Title:	
Unit 6: Building Systems	
Relevant Standards: Bold indicates priority	
CCTC - AC- Use vocabulary, symbols and formulas common to architecture and construction. CCTC - AC- Read, interpret and use technical drawings, documents and specifications to plan a project. CCTC - AC- Compare and contrast the building systems and components required for a construction project. CCTC - AC- Demonstrate the construction crafts required for each phase of a construction project. CCTC - AC- Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals. CCTC - AC - Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.	
Essential Question(s):	**Enduring Understanding(s):**
• What are building systems and how are they used in buildings and houses? • What careers are offered in the various building systems?	• Students will understand the various building systems and how each of them work. • Students will also have a better understanding of the career choices offered for those interested in building systems.
Demonstration of Learning:	**Pacing for Unit**
• Written documents • Student created project demonstrating culmination of knowledge from unit • Formative and summative assessments	9 Block Periods
Family Overview (link below)	**Integration of Technology:**
Family Overview - Construction Technology Family Overview - Construction Technology - Spanish	N/A
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
Circuit Breaker Panel Meter Outlet Switch Thermostat Ventilation Supply Line Drain Trap Vent Stack	N/A
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
• Electrical theory is often discussed in Science classes • Fluid dynamics is generally a component in high school Engineering and Physics classes	• Each building system works independently. • The structural system only supports • HVAC systems are just for heating and cooling. • Plumbing only involves water supply.
Connections to Prior Units:	**Connections to Future Units:**
Safety and the understanding of framing and loads on structures is important.	N/A
Differentiation through *Universal Design for Learning*	
UDL Indicator & Teacher Actions	
Engagement • Begin with a virtual tour of a home being built or renovated. • Pose a driving question: “How would you route HVAC, plumbing, and electrical systems in a two-story home without them interfering with each other?”	

- Bring in (or video call) guest speakers: HVAC techs, electricians, and plumbers.
- Include career videos with diverse professionals, especially from underrepresented groups.
- Use "Trade Wars" group roles: Each student represents a trade and must negotiate space in a structure for their system.

Representation

- Use clear diagrams or interactive 3D models to show where each system runs through floors/walls/ceilings.
- Display color-coded construction drawings for each system.
- Use simulation or CAD tools like SketchUp to show system pathways.
- Integrate virtual reality (if available) for immersive walkthroughs.
- Provide system flowcharts showing steps in installation and integration.
- Offer vocabulary sheets with images and simplified definitions (great for ELLs and students with IEPs).
- Show side-by-side layouts for HVAC, plumbing, and electrical systems and how they interconnect.
- Include charts for training paths, average salaries, and required certifications for each trade.

Action and Expression

- Design a section of a home and plan how the HVAC, plumbing, and electrical systems would fit into the framing.
- Create a layered drawing or model showing all three systems in a wall or floor assembly.
- Choose a trade and present the training, skills, and real-world applications.
- Options: slideshow, infographic, video, or mock podcast interview.
- Students reflect on integration challenges and trade overlaps.
- Include drawings, reflections, and notes on career insights.

Supporting Multilingual/English Learners

Related *CELP standards* aligned to Learning Targets:

CELP Level	LT 1	LT 2	LT 3	LT 4
Emerging	I can name systems like electrical, plumbing, and HVAC.	I can say systems work together.	I can use words like duct, breaker, and pipe.	I can say if something is safe or not.
Expanding	I can explain the role and importance of each building system in the function of a structure.	I can explain how building systems are coordinated and how changes in one affect others.	I can accurately use technical vocabulary to describe system components and functions.	I can assess building systems and explain how they meet or fail to meet safety and code standards.
Bridging	I can describe what each system does (e.g., plumbing carries water).	I can give examples of how systems connect (e.g., HVAC needs electricity).	I can use building system terms in conversation and writing.	I can describe problems with systems and how they may break rules.

Lesson Sequence	Learning Target	Success Criteria/Assessment
1	I can identify the major systems within a building and explain their basic functions.	• I can list and define the four main building systems: electrical, plumbing, HVAC, and structural. • I can describe what each system does and why it is essential for a building to function properly. • I can give examples of common components for each system (e.g., outlets, ducts, pipes, joists).
2	I can describe how building systems interact and depend on each other.	• I can explain how different systems are integrated (e.g., HVAC needs electrical power, plumbing vents must work with structural layout). • I can identify points in a building where multiple systems must work together. • I can discuss what might happen if one system fails and how it affects others.

3	I can use appropriate vocabulary when discussing building systems.	• I can correctly use terms like circuit, ductwork, load-bearing wall, and water heater in discussion or writing. • I can label key components of each building system on a diagram. • I can explain the function of at least three system components in my own words.
4	I can evaluate building systems for safety, efficiency, and code compliance.	• I can describe basic safety considerations for each system (e.g., grounding for electrical, backflow prevention for plumbing). • I can identify ways to improve energy or water efficiency in building systems. • I can explain the importance of following local building codes for systems installation.

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Law and Justice	**Social Studies**	**10-12**	**.5**

Course Description:

This course explores fundamental concepts of law and justice in the United States. Students will examine competing definitions of justice, the structure and constitutional principles of the U.S. court system, and the distinction between criminal and civil law. Students also learn about the specifics of criminal law, including the major categories of offenses against persons and property, as well as the stages of the criminal justice process, from arrest through sentencing and corrections. The course culminates in a mock trial experience where students apply their knowledge of legal procedures, argumentation, and courtroom roles.

Aligned Core Resources:	Connection to the ***BPS Vision of the Graduate***
	CIVIC LITERACY • Participate effectively in civic life through knowing how to stay informed and understanding governmental processes • Exercise the rights and obligations of citizenship at local state, national and global levels CRITICAL THINKING AND PROBLEM SOLVING • Collect, assess and analyze relevant information • Reason effectively. Use systems thinking • Reflect critically on learning experience, processes and solutions
Knowledge/Skill Dependent courses/Prerequisites:	**Link to *Completed Equity Audit***
• Modern American History or concurrent registration in Modern American History	• Law and Justice Equity Curriculum Review

Unit Links

Unit 1: Defining Law and Justice
Unit 2: Criminal Law and Types of Crime
Unit 3: Criminal Justice Process
Unit 4: Mock Trial

Unit 1: Defining Law and Justice

Overview

Relevant Standards: Bold indicates priority

- CG.Inq.1.a. Explain how a question reflects an enduring issue in the United States Government.
- CG.Civ.4.b. Describe how the United States Constitution organizes, enumerates, and divides power to create a limited government (e.g., separation of powers, checks and balances, necessary and proper clause, supremacy clause, 10th Amendment).
- CG.Civ.8.b. Evaluate how different levels of government work to promote civic virtue and enact democratic principles (e.g., municipal, state, and federal).
- CG.Civ.14.a. Analyze historical, contemporary, and emerging means of protecting, defending, and promoting constitutional rights in the United States (e.g., law-making, federal court system, constitutional amendments, Supreme Court decisions, exercising constitutional rights).
- CG.Civ.3.b. Analyze how federal and state court systems are articulated and maintained by constitutions and laws in the United States (e.g., District Courts, Circuit Courts, Appellate Court, Supreme Court).

Overview

This unit introduces students to fundamental concepts of law and justice while exploring the structure and functions of the U.S. court system. Students will examine the distinctions between legality and morality, analyze different conceptions of justice, and investigate how constitutional principles shape our judicial institutions and processes. The unit culminates in an analysis of one institution or role within the criminal justice system in relation to other parts of the system, constitutional principles, and definitions of justice.

Essential Question(s):

- What is justice?
- Is the U.S. criminal justice system organized to deliver justice?

Enduring Understanding(s):

- While laws are codified rules created by authorities, justice encompasses broader ethical principles about fairness and moral rightness. This distinction creates an inherent tension, as laws may be technically followed while still producing results that some would consider unjust, especially since differing conceptions of justice influence people's expectations of the legal system and their assessment of specific laws, procedures, and outcomes.

- The U.S. criminal justice system operates through a complex network of federal, state, and local institutions with distinct yet interconnected roles, deliberately designed to distribute power among multiple participants—including citizens, attorneys, and judges. This structure emphasizes procedural fairness and reflects constitutional principles of checks and balances, federalism, and due process. While these procedures aim to ensure consistent treatment under law, the system is not immune from a larger tension between technical legal compliance and broader concepts of justice.

Demonstration of Learning:

- Competing Interpretations Essay

Connections to Prior Units:	**Connections to Future Units:**
•	• Students will dive into the workings of the criminal justice system in much greater detail in future units, but continue to return to competing interpretations of justice and how various components of the system do/do not align with these varying perspectives.
Family Overview (link below)	**Pacing for Unit**
	• 6 classes, 1 flex day
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	• Lesson on definitions of justice
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
• Students study the divisions between state and federal governments, as well as constitutional principles such as federalism, checks and balances in Civics.	• Students may equate law entirely with justice, assuming that if an action is legal according to the codified rules, it must inherently be fair or morally right, or that anything illegal must be inherently unjust • Students may not have considered that there may be differing interpretations of justice, assuming that there is a single "dictionary" definition that is factual, rather than an array of competing values. • Students may view the U.S. criminal justice system as monolithic, potentially overlooking the complexity of the interactions between federal, state, and local levels or the reasons for its structure

Differentiation through *Universal Design for Learning*

UDL Indicator • CONSIDERATION 7.2 Optimize relevance, value, and authenticity	**Teacher Actions:** • Begin with current events or relatable scenarios that raise questions about law, fairness, and justice. • Use "think-pair-share" or small group discussions for students to explore their own conceptions of justice and morality before introducing formal definitions. • Connect discussions of constitutional principles to students' lives (e.g., rights in school, local governance issues). • Allow student choice in selecting which specific institution or role within the justice system they focus on for their initial analysis.
Supporting Multilingual/English Learners	
Related *CELP standards:* • 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:** • Level 1: I can respond to simple yes no questions about familiar situations to evaluate whether they are fair or just. • Level 2: I can present basic information about one type of justice by responding to “what” and “why” questions during short conversations. • Level 3: I can participate in short conversations or written exchanges about one type of justice by explaining my ideas and asking follow up questions • Level 4: I can participate in short conversations comparing two types of justice by building on the ideas of others and summarizing key points or agreement. • Level 5:: I can participate in short conversations comparing two types of justice by asking questions that probe reasoning and summarizing key points.

Unit 1: Introduction to Law and the Legal System

Lesson Map

Lesson	Text/Topic	Learning Target	Knowledge	Vocabulary
1	Shipwrecked Sailors	• I can explain the distinction between legality and morality.		Legal Moral Ethical
2	Four Approaches to Justice	• I can explain and evaluate competing definitions of justice.	Retributive Justice Restorative Justice Distributive Justice Procedural Justice	
3	Federalism in the Justice System	• I can describe similarities and differences between various courts in the United States. • I can explain how the organization of the United States court system reflects constitutional principles.	Federalism Checks and Balances Due Process District Courts Circuit Courts Supreme Courts State Courts	Hierarchy Oversight
4	Checks and Balances in the Justice System	• I can describe the roles and responsibilities of various individuals within the criminal justice system. • I can explain how the division of responsibilities within the United States court system reflects constitutional principles.	Executive Branch Legislative Branch Judges Attorneys Jurors Witnesses Citizens	Allocate Constrain
5		• I can evaluate components of the criminal justice system from multiple perspectives.		
6	Assessment			
7	Flex			

Unit 2: Criminal Law and Types of Crime

Overview

Relevant Standards: Bold indicates priority

- CG.Inq.1.a. Explain how a question reflects an enduring issue in the United States Government.
- CG.Inq.1.b. Explain how supporting questions contribute to an inquiry and how new compelling and supporting questions emerge when engaging sources that represent varied perspectives.
- CG.Civ.5.a. Evaluate the relationship between law-making, enforcement, and interpretation in balancing the rights of the individual with the well being of society (e.g., Bill of Rights, Supreme Court cases).
- CG.Inq.4.a. Construct arguments using precise and knowledgeable claims, with evidence from multiple sources, while acknowledging counterclaims and evidentiary weaknesses.

Overview

This unit examines various types of crime. Students first differentiate between civil and criminal law, before learning how the criminal justice system establishes categories and hierarchies of crime based on a variety of factors such as mental state, actions taken, type of harm, and severity of impact. Students practice applying this framework to a variety of crimes against both people and property before also considering how those same factors might be used to craft a defense against criminal charges.

Essential Question(s):

- What makes one crime worse than another?

Enduring Understanding(s):

- Our legal system establishes a hierarchy of offences with varying consequences based on factors such as mental state, actions taken, type of harm, and severity of impact. The same harmful outcome may be classified differently depending on the defendant's mental state, and the same action may be classified differently based on the resulting harm. This classification system is rooted primarily in retributive notions of justice, differentiating

between crimes for the purposes of punishment and deterrence rather than repairing harm to communities or addressing social inequities.

Demonstration of Learning:

- Determining Charges

Connections to Prior Units:	**Connections to Future Units:**
• In the previous unit, students broadened their conception of justice to include greater nuance. In this unit, students apply that knowledge to the process of determining the type and severity of crime, adding further nuance to their understanding.	• In the next units, students will learn about, then enact, key stages in the criminal justice process itself, learning what happens before, but especially after charges are filed.
Family Overview (link below)	**Pacing for Unit**
	• 7 classes, 1 flex day
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	•
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• Students may assume that the severity of a crime is determined solely by the amount or type of harm caused, potentially overlooking the critical legal role of the defendant's mental state. • Students may conflate distinct legal categories, potentially viewing all acts causing injury as "assault" for example, without recognizing how consistent criteria create a range of legal hierarchies

Differentiation through *Universal Design for Learning*

UDL Indicator	**Teacher Actions:**
• CONSIDERATION 3.2 Highlight and explore patterns, critical features, big ideas, and relationships	• Use clear comparison charts (e.g., T-charts, Venn diagrams) to explicitly contrast civil vs. criminal law. • Provide matrices or graphic organizers that clearly outline the key elements (e.g., mental state, action, harm) used to categorize different types of crimes.

	• Use multiple, varied case study vignettes (examples and non-examples) for students to practice applying the classification framework. • Use graphic organizers to show the relationship between elements of a crime and potential defense strategies.
Supporting Multilingual/English Learners	
Related *CELP standards:* • 9-12.4 An EL can . . . construct grade appropriate oral and written claims and support them with reasoning and evidence.	**Learning Targets:** • Level 1: Express an opinion about a simple, familiar scenario involving harm and a mental state. • Level 2: Construct a simple claim classifying a scenario as either murder or manslaughter and give one simple reason related to mental state. • Level 3: Construct a claim classifying a scenario according to homicide categories and provide supporting reasons or facts. • Level 4: Construct a claim classifying a scenario with a specific homicide charge, providing logically ordered reasons and evidence and addressing potential alternative classifications. • Level 5: Construct a claim classifying a complex or ambiguous scenario, distinguishing the charge from plausible alternatives based on logically ordered and relevant evidence

Unit 2: Criminal Law and Types of Crime

Lesson Map

Lesson	Text/Topic	Learning Target	Knowledge	Vocabulary
1	Crime in America	• Explain who determines what constitutes a crime and the goals for designating crimes • Interpret trends in the number of crimes reported, arrests made, and who are the victims of crime in the United States.	Crime Crimes against Person Crimes against Property Victimization	Designate Prevalent
2	Intro to Criminal Law	• I can explain how a single act can be tried in both a criminal court and a civil court • I can describe the elements of a crime and the requirements that prosecutors face in proving guilt	Criminal vs Civil Court Tort vs Crime Mens Rea Actus Reus Motive Standard of Proof Burden of Proof	Elements Burden
3	Crimes Against Person	• I can explain how different mental states determine the classification and severity of homicide charges.	Murder vs Manslaughter First vs Second Degrees Felony Murder Non Criminal Homicide Voluntary vs Involuntary	Negligent Involuntary
4	Crimes Against Person	• I can classify non-fatal crimes against persons based on the defendant's mental state and severity of harm to the victim.	Assault vs Battery Assault vs Sexual Assault First vs Second Degrees Rape vs Statutory Rape Stalking vs Cyberstalking Bullying	Aggravated Severe
5	Crimes Against Property	• I can differentiate between property crimes based on the defendant’s mental state, actions taken, and the resulting harm.	Arson vs Vandalism Larceny vs Burglary Burglary vs Robbery	Malice

			First vs Second Degrees Cybercrime	
6	Defenses	• I can describe how defense strategies may challenge key elements of crimes in order to reduce charges or establish innocence.	Alibi DNA Reasonable Doubt 5th Amendment Self defense Defense of others Insanity Plea	Justify Refute
7	Assessment			
8	Flex			

Unit 3: Criminal Justice Process

Overview

Relevant Standards: Bold indicates priority

- CG.Civ.14.a. Analyze historical, contemporary, and emerging means of protecting, defending, and promoting constitutional rights in the United States (e.g., law-making, federal court system, constitutional amendments, Supreme Court decisions, exercising constitutional rights).
- CG.Civ.5.a. Evaluate the relationship between law-making, enforcement, and interpretation in balancing the rights of the individual with the well being of society (e.g., Bill of Rights, Supreme Court cases).
- CG.Civ.2.e. Analyze the rights and responsibilities of individuals in the United States (e.g., 4th Amendment, trial by jury, jury service, interacting with law enforcement, voting).
- CG.Inq.1.c. Explain points of agreement and disagreement experts have about interpretations and applications of civic concepts and ideas associated with both compelling and supporting questions.

Overview

In this unit, students will embark on a detailed exploration of the criminal justice process, from the initial stages of arrest through sentencing and beyond. We will examine how constitutional protections shape each phase, focusing on the delicate balance between individual rights and public safety. Throughout this unit, students will critically evaluate the complexities within the system, considering its strengths, weaknesses, and the ongoing debates surrounding its effectiveness and fairness. This unit will culminate in a deeper understanding of the constitutional principles that underpin the system and the challenges of ensuring justice for all.

Essential Question(s):

- To what extent does the criminal justice process ensure justice for all?

Enduring Understanding(s):

- The criminal justice system is grounded in constitutional guarantees that emphasize procedural fairness to ensure consistent treatment under law. Applying these principles throughout the complex criminal process, from arrest through sentencing, involves many complexities and challenges that highlight the inherent tension between procedural compliance and achieving true justice. These tensions lead to ongoing debates about the overall effectiveness of the process, which are influenced by competing definitions of justice.

Demonstration of Learning:	
• Policy Reform Memo	
Connections to Prior Units:	**Connections to Future Units:**
• In prior units, students will have considered different definitions of justice. They will daw on that knowledge to identify potential questions regarding justice or fairness at each stage of the criminal justice process.	• In this unit, students learn an overview of the full criminal justice process, from arrest to corrections. In the next unit, students dive more deeply into the court proceedings themselves by conducting a mock trial.
Family Overview (link below)	**Pacing for Unit**
	• 11 classes, 1 flex day
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	• Deliberation Background • Deliberation Demonstration and Guide
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• Students may tend to gravitate towards a single definition of justice, especially a procedural emphasis on "following the steps" rather than considering a procedure from multiple perspectives. • Students may underestimate the complexities of applying legal and constitutional protections, or assume that the constitution ensures everyone is treated exactly the same way. • Students may have internalized media portrayals portraying the criminal justice process as a clear, linear path from arrest, to trial to verdict, without realizing that the majority are resolved through complex pre-trial proceedings.
Differentiation through *Universal Design for Learning*	
UDL Indicator • CONSIDERATION 3.3 Cultivate multiple ways of knowing and making meaning	**Teacher Actions:** • Provide detailed flowcharts or interactive timelines that map the stages of the criminal justice process (arrest through corrections).

	• Visually annotate each stage on the flowchart/timeline with the relevant constitutional protections/amendments (e.g., 4th, 5th, 6th, 8th) • "Chunk" the process by focusing lessons or activities on specific targets (e.g., procedures, then constitutional principles, then complications).
Supporting Multilingual/English Learners	
Related *CELP standards:* • An EL can . . . analyze and critique the arguments of others orally and in writing.	**Learning Targets:** • Level 1: I can identify the main point someone makes about whether or not a search was fair when presented clearly and with visual support. • Level 2: I can identify the main argument someone makes about whether a search was fair, as well as one reason given to support that argument. • Level 3: I can explain the reasons someone gives to support a claims bout the procedural justice of a search, and distinguish which claims are supported by evidence and which are not. • Level 4: I can determine whether the reasons and evidence someone provides are sufficient to support their claims about the fairness or legality of a search. • Level 5: I can evaluate the reasoning in an argument about the legality of a search based on constitutional principles and the evidence provided

Unit 3: Criminal Justice Process

Lesson Map

Lesson	Text/Topic	Learning Target	Knowledge	Vocabulary
1	Arrest, Search & Seizure	• I can explain how procedures surrounding arrest, search, and seizure reflect constitutional protections of individual rights. • I can examine questions of procedural justice related to probable cause and warrantless searches.	Arrest Search Seizure 4th Amendment Warrant Probable Cause Due Process	
2	Interrogation	• I can explain how police interrogation procedures reflect constitutional protections of individual rights. • I can examine questions of procedural justice related to coercion and the admissibility of evidence.	Coercion Confession Interrogation Self Incrimination 5th Amendment Miranda v. Arizona	Coerce
3	Pre-Trial Proceedings	• I can explain how pre-trial proceedings reflect constitutional protections for the accused. • I can explore questions of distributive justice related to bail determination, access to effective counsel, and plea agreements.	Arraignment Booking Bail Plea Bargaining Grand Jury Counsel Public defender Gideon v. Wainwright 6th Amendment 8th Amendment	Plea/plead
4	Trial Proceedings	• I can explain how the first half of trial proceedings reflect constitutional guarantees of a fair trial. • I can explore questions of procedural justice related to jury selection, prosecutorial conduct, and admissibility of evidence.	6th Amendment Jury selection Opening statements Prosecution's case Witnesses? Objections?	Impartial

5	Trial Proceedings	• I can explain how the second half of trial proceedings reflect constitutional protections of the accused. • I can examine questions of procedural justice related to defense strategies, burden of proof requirements, and jury deliberation.	Defense's case Burden of proof Jury tampering Jury bias? Media influence?	Deliberate Tamper
6	Sentencing	• I can explain how sentencing procedures and options reflect constitutional protections against cruel and unusual punishment. • I can explore questions of retributive justice related to sentencing disparities, mandatory minimums, and principles of proportionality.	8th Amendment Presentence report Victim impact statement Probation Restitution Imprisonment Capital Punishment	Mandatory
7	Incarceration and Parole	• I can explain how constitutional rights are lost and maintained when an individual is incarcerated. • I can examine questions of distributive justice related to prison conditions and inmates rights.	Prison population Rights of prisoners Maximum v. minimum security Recidivism Parole	
8	Correctional Approaches Navajo Peacemaking Reforms in CT	• I can explain how different correctional philosophies shape prison policies and approaches to post release supervision. • I can compare the United States correction system to other systems around the world.	Deterrence Retribution Incapacitation Rehabilitation Navajo Peacemaking Norwegian Approach	
9	Juvenile Justice	• I can explain key differences between adult and juvenile justice systems. • I can analyze tensions between rehabilitative and punitive approaches to juvenile justice based on developmental factors and differing notions of culpability.	Intake Preventive detention Adjudicatory hearing Aftercare Parens patriae Status offender Delinquent offender Neglected/abused children	
10	Deliberation Packet and Handouts	• I can discuss arguments for and against punishing juvenile offenders as adults.		

		• I can identify areas of agreement and disagreement with other deliberation participants. • I can reach a decision, individually and collectively, using evidence and sound reasoning.		
11	Assessment			
12	Flex			

Unit 4: Mock Trial

Overview

Relevant Standards: Bold indicates priority

- CG.Inq.3.b. Organize and prioritize evidence directly and substantively from multiple sources in order to develop or strengthen claims (e.g., detect inconsistencies).
- CG.Inq.3.c. Refine claims and counterclaims by pointing out strengths and limitations of arguments and explanations (e.g., precision, significance, knowledge conveyed).
- CG.Inq.4.a. Construct arguments using precise and knowledgeable claims, with evidence from multiple sources, while acknowledging counterclaims and evidentiary weaknesses.
- CG.Inq.4.d. Present arguments and explanations that feature evocative ideas and multiple perspectives about political issues and topics to reach a range of audiences and venues outside the classroom using print, oral, and digital technologies.

Overview

In this unit, students will actively participate in a mock trial, taking on the roles of attorneys, witnesses, and jurors. They will practice building compelling legal arguments, including developing a theory of the case, writing opening statements, and composing questions for direct and cross examination. Students will also learn the rules of evidence and practice courtroom procedures before taking on a new case from the role of either prosecution or defense. After the trial, students write a reflection that evaluates their theory of the case, explains how their contributions to the trial fit into that narrative, and considers how they might have improved.

Essential Question(s):

- How much does the truth matter in a trial?

Enduring Understanding(s):

- A successful trial hinges on a compelling theory of the case, a persuasive narrative that organizes evidence into coherent stories that may or may not reflect the absolute truth. These theories shape every aspect of a trial, from opening statements to closing arguments, as attorneys strategically select and present evidence that strengthens their narrative while challenging their opponents' account. This carefully structured process seeks to ensure procedural fairness and relies on many distinct roles to determine which theory of the case best accounts for the evidence provided.

Demonstration of Learning:	
• Mock Trial Preparation, Participation and Reflection	
Connections to Prior Units:	**Connections to Future Units:**
• This mock trial draws on the knowledge of the full criminal justice process, from arrest to corrections, that students have developed in the prior unit.	•
Family Overview (link below)	**Pacing for Unit**
	• 11 classes, 1 flex day
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	• Street Law Guide to Mock Trials
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• Students may assume that the outcome of a trial is based primarily on the discovery of "absolute truth," while underestimating the impact of persuasive techniques or a compelling theory of the case. • Students may believe that all the known facts are presented objectively at trial, without realizing the careful work of attorneys to select, frame, and interpret evidence to construct a narrative. • Students may equate a jury's verdict with absolute truth, rather than understanding a verdict as an evaluation of whether a prosecution met its burden of proof.
Differentiation through *Universal Design for Learning*	
UDL Indicator • CONSIDERATION 6.2 Anticipate and plan for challenges	**Teacher Actions:** • Provide students/teams with specific pre-planning prompts focused on the mock trial context. • Schedule brief "strategy review" sessions where teams present their draft "theory of the case" or outline their planned questioning strategy for a key witness. • Use peer feedback protocols where students explain their planned

	approach and justify their strategic choices to classmates or the teacher for formative critique before the trial. • Provide a detailed checklist and/or timeline of all mock trial preparation components to break the mock trial down into reachable short term objectives.
Supporting Multilingual/English Learners	
Related *CELP standards:* • 9-14.7 An EL can . . . adapt language choices to purpose, task, and • audience when speaking and writing.	**Learning Targets:** • Level 1: I can use or recognize frequently occurring words/phrases related to my assigned mock trial role with prompting and visual support. • Level 2: I can adapt my language choices by using polite language when answering simple yes/no or "wh-" questions as a witness. • Level 3: I can adapt language choices based on my assigned trial role, using some general academic and content specific vocabulary • Level 4: I can maintain a formal style appropriate for a courtroom when participating in a mock trial, using a range of academic and legal vocabulary • Level 5: I can adapt language choices and style based on strategic effect according to my purpose, task, and audience; employing a range of legal terms accurately and appropriately.

Unit 4: Mock Trial

Lesson Map

Lesson	Text/Topic	Learning Target	Knowledge	Vocabulary
1	Setting the Scene	• I can describe the essential elements and roles of a trial by jury. • I can explain and sequence the steps in a jury trial.	Defendant v. Prosecutor Testimony Burden of proof? Discovery Deposition Roles of attorneys, judge, jury, witnesses Opening Statements Direct/Cross Examination Closing Arguments Jury Instructions Verdict	
2	Making a Jury	• I can use questions and challenges to compose an impartial jury.	Impartial jury Voir dire Challenge for cause Peremptory strike	Impartial
3	Creating a Theory	• I can construct a compelling theory of the case based on a timeline of events and an analysis of the elements of a crime.	Timeline of events Elements of the crime Evidence Testimony	Claim
4	Opening Statements	• I can write, present, and evaluate an effective opening statement for either the prosecution or defense.	Primacy Motive or lack of motive Theory of case Guilty verdict Acquittal	
5	Composing Questions	• I can examine a witness using a logical sequence of direct, cross, and redirect examination questions.	Cross-examination Direct examination Redirect Leading Questions	Credible

			Impeach Credibility	
6	Rules /Procedures for Evidence?	• I can make proper objections to violations of the rules of evidence. • I can rewrite objectionable questions to adhere to the rules of evidence.	Objections Exhibits Moving into evidence Impeachment	Objectionable
7	Closing Arguments	• I can write, present, and evaluate an effective opening statement for either the prosecution or defense.	Recency Summary of case Burden of proof	
8/9	Trial Prep	• I can prepare to conduct a mock trial, correctly following the sequence of steps in a trial while employing proper technique for my role • I can prepare for oral presentations as an attorney or witness.		
10	Mock Trial	•		
11	Assessment	•		
12	Flex	•		

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
AP Psychology	**Social Studies**	**10-12**	**1**

Course Description:

AP Psychology is designed to expose students to the systematic and scientific study of behavior and mental processes of human beings and other animals. This full-year course is the equivalent of a college-level general psychology course and is designed to prepare students for the AP examination. The curriculum is intensive and sophisticated, requiring a strong level of commitment. This course is designed to expose students to an array of subjects of interest with one common thread: the student. AP Psychology will be an academic journey as students traverse psychological disorders, memory, brain function, psychological testing and experimentation, lifespan, states of consciousness, motivation, emotion, and major personality theories.

Aligned Core Resources:	Connection to the *BPS Vision of the Graduate*
•	CRITICAL THINKING AND PROBLEM SOLVING • Collect, assess and analyze relevant information • Reason effectively. Use systems thinking • Make sound judgements and decision. Identify, define and solve authentic problems and essential questions.
Knowledge/Skill Dependent courses/Prerequisites:	**Link to *Completed Equity Audit***
• World History or Modern American History Academic, course average of 87 Academic/83 Accelerated OR Dept. Recommendation	•

Unit Links

Standard Matrix
Introduction to Science Practices
Unit 1: Biological Basis of Behavior
Unit 2: Cognition
Unit 3: Development and Learning
Unit 4: Social Psychology and Personality
Unit 5: Mental and Physical Health

Unit 1: Biological Basis of Behavior

Overview

Relevant Standards: Bold indicates priority

- **1.A Apply psychological perspectives, theories, concepts, and research findings to a scenario.**
- 1.B Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes.
- 2.A Determine the type of research design(s) used in a given study.
- 2.B Evaluate the appropriate use of research design elements in experimental methodology.
- 2.C Evaluate the appropriate use of research design elements in non-experimental methodologies.
- 2.D Evaluate whether a psychological research scenario followed appropriate ethical procedures
- **3.A Identify Psychology-related concepts in descriptions or representations of data.**
- 3.B Calculate and interpret measures of central tendency, variation, and percentile rank in a given data set.
- 3.C Interpret quantitative or qualitative inferential data from a given table,graph,chart,figure,or diagram.
- 4.A Propose a defensible claim.

Overview

Unit 1 focuses on how the functions of our biological systems influence our physical and mental actions and responses. Students begin by studying the role of heredity and the environment in human development, before moving on to study biological functions and mechanisms, especially how neurons communicate, how the brain functions, and how sleep and sensation impact behavior and mental processes.

Essential Question(s):

- Why do we learn biology in a psychology course?
- How much of who you are is determined by what's in your brain?

Enduring Understanding(s):

- All psychological phenomena studied throughout AP Psychology have a biological basis.
- Although we are all shaped by our own unique experiences, all of those experiences are mediated and made possible by the same biological structures and processes.

Demonstration of Learning:

- Mid Unit Assessment
- Celebrity Brain Mini Project
- End of Unit Assessment (MC + Sleep AAQ)

Connections to Prior Units:	**Connections to Future Units:**
•	• In Unit 2, students will learn that biological mechanisms are vital to memory • In Unit 5, they will discover that damage to certain biological structures can be the cause of psychological disorders.
Family Overview (link below)	**Pacing for Unit**
	• 16 classes, 6 weeks
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	•
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• Students may oversimplify the complex interplay between nature and nurture introduced in this unit, attributing human behavior to a single cause, rather than appreciating the interactions between biology, heredity, and environment.
Differentiation through *Universal Design for Learning*	
UDL Indicator • Checkpoint 7.2: Optimize relevance, value, and authenticity.	**Teacher Actions:** • Start lessons by posing questions about familiar everyday experiences that can be explained by biological psychology. • Explicitly link biological topics to future psychological concepts. For Sensation (Topic 1.6), explain how understanding sensory organs is foundational to understanding perception in Unit 2. • Use brief, impactful examples of how biological factors drastically affect behavior and mental processes students will return to later, such as the impact of brain injuries on personality or ability. • Discuss how understanding sleep cycles (Topic 1.5) or the nervous

	system's response to stress (foreshadowing Unit 5) can inform personal health choices.
Supporting Multilingual/English Learners	
Related *CELP standards:* •	**Learning Targets:** • Level 1: With prompting and visual supports, I can identify a few key words (such as brain, neuron, or lobe) from simple oral descriptions or labeled diagrams. • Level 2: With prompting and supports, I can identify the main topic (parts of the brain) and retell a few key details about the function of one part of the brain based on a simple oral or written text. • Level 3: With guidance, I can determine the central idea about brain function from a simplified informational text and explain how specific details support that idea. • Level 4: I can determine how two different brain structures contribute to behavior, using specific details from a grade-appropriate text to demonstrate the development of those main ideas. • Level 5: I can determine central ideas about the complex relationship between brain structures and psychological functions, and analyze how these ideas are developed with supporting evidence in a grade-appropriate text.

Unit 1: Biological Basis of Behavior

Lesson Map

Lesson	Learning Target	Success Criteria	Vocabulary
1 - Topic 1.1	• I can explain the relationship between heredity and environment in shaping behavior and mental processes	• I can summarize the nature vs nurture debate • I can explain the evolutionary perspective • I can explain various ways of researching the role of heredity and environment	Natural selection Eugenics Twin Studies Family Studies Adoption Studies
2 - Topic 1.2	• I can differentiate among the subsystems of human nervous system and their functions • I can explain how the structures and functions of typical neurons in the central nervous system affect behavior and mental processes.	• I can explain the functions of the central, peripheral, autonomic and somatic systems. • I can identify and explain the two common types of neural cells in the brain • I can identify and explain common types of neural cells In the spinal cord	Sympathetic nervous system Parasympathetic nervous system Glial Cells Reflex arc Sensory neurons Motor Neurons Interneurons
3 - Topic 1.3	• I can explain how the basic process of neural transmission is related to behavior and mental processes.	• Describe the process of neurotransmission • I can explain the functions of various neurotransmitters • I can describe the impact of the endocrine system	All or nothing principle Depolarization Reuptake Multiple sclerosis Excitatory/Inhibitory Neurons Dopamine Norepinephrine GABA Substance P Hormones Leptin Melatonin Refractory Period Resting Potential Threshold Serotonin

			Glutamate Endorphins Acetylcholine Adrenaline Ghrelin Oxytocin
4 - Topic 1.3	• I can explain how psychoactive drugs affect behavior and mental processes.	• Describe effects on neurotransmitter function • Describe both psychological and physiological effects	Antagonist/ Agonist Stimulants Caffeine Cocaine Opioids Heroine Addiction Reuptake Inhibitor Depressants Alcohol Hallucinogens Marijuana Tolerance Withdrawal
5/6/7 - Topic 1.4	• I can explain how the structures and functions of the brain apply to behavior and mental processes.	• I can explain the functions of the brain stem, reticular activating system, cerebellum, and cerebral cortex. • I can describe findings from split brain research. • I can explain the function of brain plasticity.	EEG fMRI Lesions Medulla Oblongata Limbic System Thalamus Hypothalamus Pituitary Gland Amygdala Hippocampus Corpus Callosum Broca's Area Wernicke's Area Cortex Specialization Contralateral Hemispheric Organization Aphasia Occipital Lobe Temporal Lobe

			Parietal Lobe Somatosensory Cortex Frontal Lobe Prefrontal Cortex Motor Cortex
8	Mid Unit Assessment		
9/10 - Topic 1.5	• I can explain how the sleep wake cycle affects behavior and mental processes throughout the day and night.	• I can explain the function of the circadian rhythm and stages of sleep. • I can explain dream theories and the impact on memory consolidation. • I can explain sleep disorders and disruptions.	Consciousness Jet Lag EEG Patterns REM/NREM REM Rebound Hypnagogic Sensations Activation Synthesis Theory Consolidation Theory Insomnia Narcolepsy REM Sleep Behavior Disorder Sleep Apnea Somnambulism
11 - Topic 1.6	• I can explain how the process of sensation is related to behavior and mental processes.	• I can describe the detection of a stimulus/stimulus change. • I can explain the connection and interaction of sensory systems.	Absolute Threshold Just-Noticeable Difference Weber's Law Sensory Adaptation Sensory Interaction Synesthesia
12 - Topic 1.6	• I can explain how the structures and functions of the visual and auditory system relate to behavior and mental processes.	• I can explain how transduction and accommodation occur in the visual system. • I can explain color vision theories. • I can explain how brain damage can result in visual disorders. • I can explain how the properties of soundwaves lead to determining the location of sound. • I can describe theories of pitch detection. • I can explain how hearing difficulties result.	Retina Blind Spot Visual (Optic) Nerve Lens Nearsightedness/Farsightedness Fovea Photoreceptors Rods Cones Trichromatic Theory

			Wavelengths Amplitude Place Theory Volley Theory Frequency Theory Conduction Deafness Sensorineural Deafness Opponent-Process Theory Afterimages Ganglion Cells Dichromatism Monochromatism Prosopagnosia Blindsight
13 - Topic 1.6	• I can explain how the structures and functions of the chemical sensory systems relate to behavior and mental processes. • I can explain how the structures and functions of touch relate to behavior and mental processes. • I can explain how the structures and functions that maintain balance and body movement relate to behavior and mental processes.	• I can describe how detection and transduction occurs in the nose. • I can explain the transduction of taste, types of taste, and types of tasters • I can explain sensory interaction • I can explain how touch is processed in the skin and brain. • I can explain the function and complexities of pain. • I can explain how vestibular and kinesthetic senses maintain balance and body position.	Olfactory System Thalamus Pheromones Gustation Taste Receptors Umami Oleogustus Medium Tasters/Nontasters Gate Control Theory Phantom Limb Sensation Semicircular Canals
14	• AP Progress Check/Review		
15	• EOU Assessment		
16	• Flex		

Unit 2: Cognition

Overview

Relevant Standards: Bold indicates priority

- **1.A Apply psychological perspectives, theories, concepts, and research findings to a scenario.**
- **1.B Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes.**
- 2.A Determine the type of research design(s) used in a given study
- 2.B Evaluate the appropriate use of research design elements in experimental methodology.
- 2.C Evaluate the appropriate use of research design elements in non-experimental methodologies.
- 2.D Evaluate whether a psychological research scenario followed appropriate ethical procedures.
- 3.A Identify Psychology-related concepts in descriptions or representations of data.
- 3.B Calculate and interpret measures of central tendency, variation, and percentile rank in a given data set.
- 3.C Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.
- 4.A Propose a defensible claim.
- 4.B Provide reasoning that is grounded in scientifically derived evidence to support, refute, or modify an established or provided claim, policy, or norm.

Overview

This unit introduces them to the memory processes and contains content that is relevant to their daily lives, such as how people remember and perceive the world around them. In Unit 2, students learn about the basic elements of thought, judgment,and problem-solving, as well as research based strategies for memory improvement that can be directly applicable to their lives outside of the classroom. Students also delve into the measurement of intelligence and achievement, including how these assessments have been used both to identify students with aptitude to increase opportunities in school and the workplace, but also to limit access to jobs, military ranks, and educational institutions.

Essential Question(s):

- What strategies should you use to help you remember important things?
- Why don't people always make good decisions?
- How much does IQ matter?

Enduring Understanding(s):

- While different study strategies may be successful, the most successful study strategies will all rely on deep processing to encode information in memory, as well as the process of retrieving encoded information from memory to strengthen neural connections. Forgetting is a natural and expected process, but can be overcome by spaced, ongoing retrieval.

- Decision making can be influenced by Heuristics, lack of creativity, Cognitive processes such as gambler's fallacy and sunk-cost fallacy can hinder people from making good decisions.
- Definitions of intelligence, and how to measure it, have been debated and changed over time. Measures of intelligence can have concrete implications on individuals lives, such as employment, or educational programming, but poverty, discrimination, and educational inequities can negatively influence intelligence scores of individuals and societal groups around the world, and IQ scores tend to vary more within a group than between groups.

Demonstration of Learning:

- Mid Unit Assessment
- End of Unit Assessment (MC + AAQ)

Connections to Prior Units:	**Connections to Future Units:**
• This unit builds on the knowledge of anatomical structures and biological processes students learned in Unit 1.	• Unit 2 content will remain important as students move on to discussions of cognitive development in children and adults in Unit 3, where they will encounter a reappearance of concepts, such as schema and memory failure.
Family Overview (link below)	**Pacing for Unit**
	• 13 classes, 5 weeks
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	•
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• Students may view memory as a recorder, rather than recognizing that memory formation is an active process. • Students may see forgetting as a defect or failure, rather than a natural part of how memory functions. • Similarly, students often rely on poor study strategies, focusing on reviewing information rather than choosing strategies focused on spaced retrieval and processing of information. • Students may ascribe poor decisions to individual failings, rather than recognizing repeatable patterns that often underlie poor decisions.

	• Students may believe that IQ tests are perfect measures of innate and unchanging intelligence, without historical debates surrounding intelligence and the many factors that impact scores.
Differentiation through *Universal Design for Learning*	
UDL Indicator • Checkpoint 2.5: Illustrate through multiple media.	**Teacher Actions:** • Use animated diagrams, flowcharts, and interactive simulations to explain the multi-store model of memory, working memory, or levels of processing • Use optical illusions, ambiguous figures, and videos demonstrating change blindness or inattentional blindness to make perceptual concepts tangible. • Present theories of intelligence through profiles of individuals who might exemplify different types of intelligence, rather than just descriptions of theories
Supporting Multilingual/English Learners	
Related *CELP standards:* •	**Learning Targets:** • Level 1: With prompting and supports, I can communicate basic information about memory using familiar words and phrases like short-term and "long-term." • Level 2: With prompting and supports, I can deliver a short oral presentation or compose a short written text using some academic vocabulary to describe a simple memory model. • Level 3: With guidance and supports, I can deliver a short oral presentation or compose a written informational text using some specific details and visuals to explain one component of a memory model. • Level 4: I can deliver an oral presentation or compose a written informational text including relevant general and specific details and domain specific vocabulary to describe a specific memory model. • Level 5: I can deliver an oral presentation or compose a written informational text including relevant details, concepts, and examples to fully develop and compare two different models of memory, using precise academic and domain-specific vocabulary.

Unit 2: Cognition

Lesson Map

Lesson	Learning Target	Success Criteria	Vocabulary
1 - Topic 2.1	• Explain how internal and external factors influence perception. •	• Compare bottom up and top down processing • I can explain the principles of Gestalt psychology • I can define attention and describe how it is affected by internal and external factors	Bottom-up processing Top-down processing Schema Perceptual set Gestalt psychology Closure Figure and ground Proximity Similarity Attention Selective attention Cocktail party effect Inattentional blindness Change blindness
2 -Topic 2.1	• Explain how visual perceptual processes produce correct or incorrect interpretations of stimuli.	• I can describe the impact of binocular and monocular cues on perception • I can identify examples of visual perceptual constancies and apparent movement	Binocular depth cues Retinal disparity Convergence Monocular depth cues Relative clarity Relative size Texture gradient Linear perspective Interposition Apparent movement
3 -Topic 2.2	• Explain how psychological concepts and theories account for thinking, problem-solving, judgment, and decision-making.	• I can describe the process of schema formation • I can compare algorithms and heuristics as problem solving strategies	Prototypes Schemas Assimilation Algorithms Heuristics

		• I can describe factors that influence decision making	Representativeness heuristic Availability heuristic Mental set Priming Accommodation Creativity Executive functions Algorithms Heuristics Representativeness heuristic Availability heuristic Mental set Priming Framing Gambler's fallacy Sunk-cost fallacy Divergent thinking Convergent thinking Functional fixedness
4 - Topic 2.3	• Explain how the types, structures, and processes of memory work.	• I can compare/contrast implicit and explicit memory • I can compare/contrast working memory, multi store, and level of processing models of memory.	Storage Retrieval Explicit memory Episodic memory Semantic memory Implicit memory Procedural memory Prospective memory Long-term potentiation Working memory model Primary memory system Working memory Central executive Phonological loop Visuospatial sketchpad Long-term memory Multi-store model Sensory memory Iconic memory Echoic memory

			Automatic processing Effortful processing Encoding Storage Retrieval Levels of processing model Shallow encoding Deep encoding Structural, phonemic, semantic
5 - Topic 2.4	• Explain how different encoding processes work to get information into memory	• I can define encoding • I can explain how various strategies influence the level of encoding.	Encoding Mnemonic devices Method of loci Chunking Categories Hierarchies Spacing effect Memory consolidation Massed practice Distributed practice Serial position effect Primacy effect Recency effect
6 - Topic 2.5	• Explain how memory storage processes retain information in memory.	• I can define and compare different types of memories • I can explain why some memories are stronger than others	Sensory memory Short-term memory Working memory Long-term memory Maintenance rehearsal Elaborative rehearsal Memory retention Autobiographical memory Retrograde amnesia Anterograde amnesia Alzheimer's disease Infantile amnesia
7 - Topic 2.6	• Explain how memory retrieval processes get information out of memory	• I can compare recall and recognition • I can compare various means of enhancing memory retrieval	Retrieval Recall Recognition

			Retrieval cues Context-dependent memory Mood-congruent memory State-dependent memory Testing effect Metacognition
8 - Topic 2.7	• Explain possible reasons why memory failure or errors may occur.	• I can describe natural causes, theoretical causes, and external causes of memory failure.	Forgetting curve Encoding failure Proactive interference Retroactive interference Tip-of-the-tongue phenomenon Repression (psychodynamic) Misinformation effect Source amnesia Constructive memory Memory consolidation Imagination inflation
9 - Topic 2.8	• Explain how modern and historical theories describe intelligence. • Explain how intelligence is measured.	• Identify points of agreement and disagreement over time • Describe IQ and evaluate IQ testing in terms of standardization, reliability, validity, and potential bias.	Intelligence g (general intelligence) Intelligence quotient (IQ) Mental age Chronological age Standardization Validity Construct validity Predictive validity Reliability Test-retest reliability Split-half reliability Predictive validity Reliability Test-retest reliability Split-half reliability
10	• Evaluate if/when IQ testing is useful and appropriate	• I can describe and explain variations in IQ scores across time and across groups.	Achievement tests Aptitude tests

		• Explain how systemic issues relate to the quantitative and qualitative uses of intelligence assessments. • Explain how academic achievement is measured and experienced as compared to intelligence.	
11	Progress Check & Review		
12	EOU Assessment		
13	Flex		

Unit 3: Development and Learning

Overview

Relevant Standards: Bold indicates priority

- **1.A Apply psychological perspectives, theories, concepts, and research findings to a scenario.**
- 1.B Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes.
- **2.A Determine the type of research design(s) used in a given study**
- 2.B Evaluate the appropriate use of research design elements in experimental methodology.
- **2.C Evaluate the appropriate use of research design elements in non-experimental methodologies.**
- 2.D Evaluate whether a psychological research scenario followed appropriate ethical procedures.
- 3.A Identify Psychology-related concepts in descriptions or representations of data.
- 3.B Calculate and interpret measures of central tendency, variation, and percentile rank in a given data set.
- 3.C Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.
- 4.A Propose a defensible claim.
- 4.B Provide reasoning that is grounded in scientifically derived evidence to support, refute, or modify an established or provided claim, policy, or norm.

Overview

Unit 3 opens with developmental psychology's research methods before exploring the physical and cognitive changes across the human lifespan, including key topics like gender, language, and social-emotional development. The unit then shifts focus to examine how humans learn, covering the fundamental principles of classical and operant conditioning. Finally, it explores how social and cognitive factors influence the learning process, tying together development and behavioral change.

Essential Question(s):

- To what extent do people change over time?
- How important is our environment in shaping our behavior?

Enduring Understanding(s):

- While the most noticeable and dramatic growth and development stage occurs from birth to roughly 18 years of age, people continue to grow and develop throughout their lives. Though some aspects of an individual person, such as personality or eye color, remain relatively stable throughout life, other aspects, such as memory retention and sensory acuity, can fluctuate with age. People experience formal and informal learning throughout a significant portion of their lives.

- Behaviorists have traditionally focused on observable behavior to the exclusion of mental processes, as evidenced by Classical Conditioning.. Operant conditioning focuses on associating consequences (reinforcement and punishment) with behaviors.

Demonstration of Learning:

- Mid Unit Assessment
- End of Unit Assessment (MC + AAQ)

Connections to Prior Units:	**Connections to Future Units:**
• As discussed in Unit 1, the concept nature-nurture plays a large role in explaining our development through the lifespan.	• In Unit 4, the concept of personality builds on the question of stability versus change across the lifespan introduced in this unit..
Family Overview (link below)	**Pacing for Unit**
•	• 16 classes, 6 weeks
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	•
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• As in Unit 1, students may oversimplify the process of human development by failing to account for the complex interaction between genetic predispositions, and environmental influences. • Students may see developmental stages as rigid, fixed, and universal age brackets, rather than approximations that allow for individual and cultural variations. • Students may have trouble distinguishing between classical and operant conditioning, failing to see the difference between passive learning through association in classical conditioning, and the active learning through consequences involved in operant conditioning.

Differentiation through *Universal Design for Learning*

UDL Indicator	**Teacher Actions:**
• Checkpoint 3.1: Activate or supply background knowledge.	• Before introducing a developmental stage, ask students to

	brainstorm or quickwrite what they already associate with the topic from their own experiences or observations. • Have students privately reflect on their own developmental milestones, or those of younger siblings/relatives, before linking them to more formal theories. • When introducing terms like "reinforcement" or "punishment," start with simple, relatable, everyday examples before moving to more technical definitions and applications.
Supporting Multilingual/English Learners	
Related *CELP standards:* •	**Learning Targets:** • Level 1: With prompting and supports, I can communicate basic information about a simple example of classical conditioning using a narrow range of vocabulary and simple sentences. • Level 2: With prompting and supports, I can introduce the topic of classical conditioning and explain a brief sequence of events in a conditioning example (e.g., Pavlov's dogs) using common linking words. • Level 3: With guidance and supports, I can introduce and develop the topic of classical conditioning with a few facts and details, and explain a short sequence of how an association is formed using common transitional words. • Level 4: I can introduce and develop the topic of classical conditioning with facts, details, and evidence, and explain a detailed sequence of events in a classical conditioning scenario, using a variety of more complex transitions to clarify relationships between stimuli and responses. • Level 5: I can introduce and effectively develop the topic of classical conditioning with clear facts, details, and evidence, and explain a coherent and detailed sequence of how a conditioned response is acquired and can be extinguished, using complex and varied transitions.

Unit 3: Development and Learning

Lesson Map

Lesson	Learning Target	Success Criteria	Vocabulary
1 Topic 3.1	• Explain how enduring themes inform developmental psychology. • Describe ways cross sectional and longitudinal research design methods used in developmental psychology inform understanding about behavior and mental processes.	• Describe how various perspectives of development have shaped the study of human development. •	Chronological development Lifespan development Stability and change Nature and nurture Continuous development Discontinuous development
2-3 Topic 3.2	• Explain how physical development throughout the lifespans applies to behavior and mental processes.	• Identify the physical developmental milestones across the lifespan. • Explain the ways in which the timing of physical development varies within each stage of development.	Teratogens Fine motor coordination Gross motor coordination Maturation Reflexes Rooting reflex Visual cliff Critical periods Sensitive periods Imprinting
4 Topic 3.4	• Describe Piaget's stages of cognitive development	• Identify cognitive developmental milestones associated within each stage •	Schemas Assimilation Accommodation Sensorimotor stage Object permanence Preoperational stage Mental symbols Pretend play Conservation Reversibility Animism Egocentrism

			Concrete operational stage Systematic thinking Formal operational stage Abstract thinking Hypothetical thinking
5 Topic 3.4	• I can compare Vygotsky's theory of mind to Piaget's stages of cognitive development	• Explain Vygotsky's theory of mind • Explain changes in cognitive development that occur in adulthood.	Scaffolding (as it pertains to Vygotsky) Theory of mind Zone of proximal development Crystallized intelligence Fluid intelligence Dementia
6 Topic 3.5	• Explain how language develops in humans.	• Describe common structural components of language. • Explain the stages of universal language development.	Phonemes Morphemes Semantics Grammar Syntax Cooing Babbling One-word stage Telegraphic speech Overgeneralization of language rules
7 Topic 3.6	• Explain the various ways social development progresses from birth through the lifespan.	• I can describe various attachment styles in childhood. • I can explain challenges that humans experience with social development across the lifespan.	Ecological systems theory Microsystem Mesosystem Exosystem Macrosystem Chronosystem Attachment styles Secure attachment Insecure attachment Avoidant attachment Anxious attachment Disorganized attachment Temperament Separation anxiety Parallel play Pretend play

			Egocentrism Imaginary audience Personal fable Social clock Emerging adulthood Stages of psychosocial dev. Trust and mistrust Autonomy and shame and doubt Initiative and guilt Industry and inferiority Identity and role confusion Intimacy and isolation Generativity and stagnation Integrity and despair Adverse childhood experiences (ACEs) Achievement Diffusion Foreclosure Moratorium Racial/ethnic identity Sexual orientation Religious identity Occupational identity Familial identity Possible selves
8 Topic 3.6	• Explain the various ways social development progresses from birth through the lifespan.	• Explain how adolescent social development is impacted by different parenting styles, as well as the formation of one's identity.	Racial/ethnic identity Sexual orientation Religious identity Occupational identity Familial identity Possible selves Authoritarian parenting Authoritative parenting Permissive parenting
9/10 Topic 3.7	• Explain how classical conditioning applies to behavior and mental processes.	• I can identify and apply the principles of the Classical Conditioning model. • I can determine components of Classical Conditioning which occur in real life scenarios.	Behavioral perspective Classical conditioning Association Acquisition

			Associative learning Unconditioned stimulus (UCS) Unconditioned response (UR) Conditioned response (CR) Conditioned stimulus (CS) Extinction Spontaneous recovery Stimulus discrimination Stimulus generalization Higher-order conditioning Counterconditioning Taste aversion One-trial conditioning Biological preparedness One-trial learning Habituation
11/12 Topic 3.8	• Explain how operant conditioning applies to behavior and mental processes.	• I can identify and apply the principles of the Operant Conditioning model. • I can determine components of Operant Conditioning which occur in real life scenarios.	"Operant conditioning Reinforcement Punishment Law of Effect Positive reinforcement Negative reinforcement Primary reinforcers Secondary reinforcers Reinforcement discrimination Reinforcement generalization Shaping Superstitious behavior Learned helplessness Reinforcement schedules Continuous reinforcement Partial reinforcement Fixed interval Variable interval Fixed ratio Variable ratio Scalloped graph Instinctive drift

13 Topic 3.9	• Explain how social learning applies to behavior and mental processes. • Explain how cognitive factors in learning apply to behavior and mental processes.	• I can describe how social learning theory highlights the importance of observational learning. • I explain various cognitive approaches to learning.	Social learning theory Vicarious conditioning Modeling Insight learning Latent learning Cognitive map
14	• Progress Check/Review		
15	• EOU Assessment		
16	• Flex		

Unit 4: Social Psychology and Personality

Overview

Relevant Standards: Bold indicates priority

- **1.A Apply psychological perspectives, theories, concepts, and research findings to a scenario.**
- **1.B Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes.**
- 2.A Determine the type of research design(s) used in a given study
- 2.B Evaluate the appropriate use of research design elements in experimental methodology.
- **2.C Evaluate the appropriate use of research design elements in non-experimental methodologies.**
- 2.D Evaluate whether a psychological research scenario followed appropriate ethical procedures.
- 3.A Identify Psychology-related concepts in descriptions or representations of data.
- 3.B Calculate and interpret measures of central tendency, variation, and percentile rank in a given data set.
- 3.C Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.
- 4.A Propose a defensible claim.
- 4.B Provide reasoning that is grounded in scientifically derived evidence to support, refute, or modify an established or provided claim, policy, or norm.

Overview

This unit explores how external social factors and internal personality variables come into play in a wide variety of everyday situations for people. Psychologists throughout history have proposed different theories that categorize different personalities and explain their connection to behavior and mental processes. Various perspectives in psychology have shaped these theories and how psychologists study personality. Some psychologists study what motivates us and/or our emotional responses to understand our individual differences; other psychologists seek to understand why different personalities exist, how they are developed, and if and how they change.

Essential Question(s):

- How do expectations, biases, and attitudes affect our relationships with ourselves and others?
- Why are human motivational and emotional states not always stable?
- To what extent can we “be our own person” while existing with others?

Enduring Understanding(s):

- Although our minds rely on expectations, existing attitudes, and cognitive biases to efficiently interpret social information and maintain a coherent self-concept, these mental shortcuts can also lead to prejudice, misjudgment in our relationships, and internal conflict when our beliefs and actions are inconsistent.

- Our emotional states and motivations are constantly changing based on the interaction of our innate personalities, biological needs, learned responses, and fluctuating social-environmental pressures.
- Although individuals often strive for autonomy, the powerful forces of social influence, such as conformity to group norms, obedience to authority, and various group dynamics, frequently lead people to think and act in ways they might not in isolation, creating a persistent tension between the pressures of the social world and the capacity for independent thought and action.

Demonstration of Learning:

- Mid Unit Assessment
- End of Unit Assessment (MC + AAQ)

Connections to Prior Units:	**Connections to Future Units:**
• This unit draws upon the biological functioning of the nervous system that was previously discussed in Unit 1, such as the sympathetic/parasympathetic nervous influence on motivation and emotion.	• As they explore the content of this unit, students will gain understanding about themselves, their peers, their families, and others who they may maintain day-to-day life and begin to provide insight into factors that may contribute to mental and physical health issues that they will examine in Unit 5.
Family Overview (link below)	**Pacing for Unit**
	• 12 classes, 5 weeks
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	•
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• Students may initially fall into the fundamental attribution error by overestimating the internal factors when explaining others behavior, while focusing on situational factors when explaining their own. • Students may struggle to differentiate between prejudice and discrimination, between negative attitudes and beliefs about a group and behavior based on those beliefs.

	• Students may have negative associations with conformity and be used to hearing that term used pejoratively, rather than recognizing that conformity can be an essential elements of social cohesion and healthy group functioning.
Differentiation through *Universal Design for Learning*	
UDL Indicator • Checkpoint 8.3: Foster collaboration and community.	**Teacher Actions:** • Have students work in groups to analyze real-world scenarios, news articles, or video clips depicting social influence or attributional biases. • For personality theories or theories of motivation/emotion, use a jigsaw strategy to have student "experts" share, compare, and contrast their knowledge with others. • Present groups with scenarios depicting social dilemmas and have them brainstorm and discuss potential psychological factors and solutions.
Supporting Multilingual/English Learners	
Related *CELP standards:* •	**Learning Targets:** • Level 1: With prompting and supports, I can express an opinion about why someone behaved a certain way, using a limited number of words and phrases. • Level 2: With prompting and supports, I can construct a claim about why a person in a familiar scenario acted as they did, introduce the topic, and give a reason for my claim using some academic vocabulary. • Level 3: With guidance and supports, I can construct a claim about a person's behavior in a familiar scenario, introduce the topic, provide sufficient evidence or reasons (e.g., distinguishing between dispositional and situational attributions) to support the claim, and acknowledge an opposing idea. • Level 4: I can construct a claim explaining someone's behavior using attribution theory by introducing the topic, providing logically ordered reasons or facts (e.g., identifying fundamental attribution error) that effectively support the claim, and addressing a counterargument in a formal style. • Level 5: I can construct a claim analyzing behavior in a complex social situation using attribution theory, distinguish it from a

	counter-claim, provide logically ordered and relevant reasons and evidence to support the claim, and provide a conclusion that summarizes the argument.

Unit 4: Social Psychology

Lesson Map

Lesson	Learning Target	Success Criteria	Vocabulary
1 Topic	• Explain how attribution theory applies to behavior and mental processes. • Explain how person perception applies to behavior and mental processes.	• I can explain the various ways in which people explain their own behavior compared to the behavior of others. • Explain how locus of control (internal and external) applies to behavior and mental processes.	Attributions Dispositional attributions Situational attributions Explanatory style Optimistic explanatory style Pessimistic explanatory style Actor/observer bias Fundamental attribution error Self-serving bias "Internal locus of control External locus of control Mere exposure effect Self-fulfilling prophecy Social comparison Upward social comparison Downward social comparison Relative deprivation"
2 Topic	• Explain how stereotypes and implicit attitudes contribute to the behaviors and mental processes of prejudice and discrimination. • Explain how belief perseverance and cognitive dissonance apply to attitude formation and change	• Explain various cognitive factors which lead to prejudice, discrimination and attitude formation.	Stereotype Cognitive load Prejudice Discrimination Implicit attitudes Just-world phenomenon Out-group homogeneity bias In-group bias Ethnocentrism Belief perseverance Confirmation bias Cognitive dissonance

3 Topic 4.3	• Explain how behavior and mental processes are affected by social situations, group memberships, prosocial behavior.	• Identify various influences on the way people behave in social situations. • Explain the reasons why people are more or less likely to help others.	Social norms Social influence theory Normative social influence Informational social influence Persuasion Elaboration likelihood model Central route Peripheral route Halo effect Foot-in-the-door technique Door-in-the-face technique Conformity Obedience Individualism Collectivism Multiculturalism Group polarization Groupthink Diffusion of responsibility Social loafing Deindividuation Social facilitation False consensus effect Superordinate goals Social traps Industrial-organizational (I/O) psychologists Burnout Altruism Prosocial behavior Social debt Social reciprocity norm Social responsibility norm Bystander effect Situational variables Attentional variables
4 Topic 4.4	• I can compare and contrast the psychodynamic and humanistic theories of personality.	• Explain how the psychodynamic theory of personality defines and assesses personality.	Humanistic psychology Unconditional regard Self-actualizing tendency

		• Explain how the humanistic theory of personality defines and assesses personality	
5 Topic 4.5	• Explain how the social-cognitive theory of personality defines and assesses personality. • Explain how trait theories of personality define and assess personality.	• I can compare and contrast how the social-cognitive and trait theories explain and assess personality.	Trait theories Big Five theory Agreeableness Openness to experience Extraversion Conscientiousness Emotional Stability Personality inventories Factor analysis Social-cognitive theory Reciprocal determinism Self-concept Self-efficacy Self-esteem
6 Topic 4.6	• Explain how theories about motivation apply to behavior and mental processes.	• I can compare theories of motivation and how they address why people behave in the ways that they do.	Drive-reduction theory Homeostasis Arousal theory Optimal level of arousal Yerkes-Dodson Law Self-determination theory Intrinsic motivation Incentive theory Extrinsic motivation Instincts Lewin's motivational conflicts theory Approach-approach conflicts Approach-avoidance conflicts Avoidance-avoidance conflicts Sensation-seeking theory Thrill seeking Adventure seeking Disinhibition Boredom susceptibility

7 Topic 4.6	• Explain how eating and belongingness motivate behavior and mental processes.	• Describe the internal and external factors related to eating.	Ghrelin Leptin Hypothalamus Pituitary gland
8 Topic 4.7	• Explain how theories of emotion apply to behavior and mental processes.	• Describe the internal and external factors that impact our emotion.	Affect Internal and external factors Physiological vs cognitive experiences Cognitive label Facial-feedback hypothesis Cognitive appraisal
9 Topic 4.7	• Explain how social norms and experiences influence the expression of emotions.	• Explain how emotions can be expressed universally and the ways that culture can impact the display of emotion.	Display rules Elicitors
10	• Progress Check/Review		
11	• EOU Assessment		
12	• Flex		

Unit 5: Mental and Physical Health

Overview

Relevant Standards: Bold indicates priority

- 1.A Apply psychological perspectives, theories, concepts, and research findings to a scenario.
- **1.B Explain how cultural norms, expectations, and circumstances, as well as cognitive biases apply to behavior and mental processes.**
- 2.A Determine the type of research design(s) used in a given study
- 2.B Evaluate the appropriate use of research design elements in experimental methodology.
- 2.C Evaluate the appropriate use of research design elements in non-experimental methodologies.
- **2.D Evaluate whether a psychological research scenario followed appropriate ethical procedures.**
- 3.A Identify Psychology-related concepts in descriptions or representations of data.
- 3.B Calculate and interpret measures of central tendency, variation, and percentile rank in a given data set.
- 3.C Interpret quantitative or qualitative inferential data from a given table, graph, chart, figure, or diagram.
- 4.A Propose a defensible claim.
- 4.B Provide reasoning that is grounded in scientifically derived evidence to support, refute, or modify an established or provided claim, policy, or norm.

Overview

Health psychologists explore factors that help people lead mentally and physically healthy lives. Positive psychologists explore factors related to mental health and happiness, focusing on positive emotions, cognitions, and experiences. Psychologists who study and/or treat psychological disorders utilize theoretical perspectives to explain the disorder's origin and/or determine the best method for its treatment. These explanations and treatments build on the theories, perspectives, concepts, and processes studied throughout the course. Connecting content and perspectives presented in this unit and those presented in the previous four units can help students realize why psychologists use integrated approaches and evidence-based practices to understand and treat psychological disorders.

Essential Question(s):

- What is “normal” thinking and behaving?
- How can we apply health, positive, and clinical psychology principles to change our lives and the lives of others, in a positive way?

Enduring Understanding(s):

- Defining psychological disorders is a complex process which entails examination of biological, psychological, and social factors. The criteria within the DSM-V presents considerations for diagnosis and each classification of disorders has its own symptoms with some overlapping between disorders.
- There are a number of ways to treat stress and psychological disorders which include the use of medications, various forms of therapeutic approaches and lifestyle changes. It is important to evaluate the proper level of care necessary and the cognitive and behavioral changes which can lead to better physical and mental health.

Demonstration of Learning:

- Mid Unit Assessment
- End of Unit Assessment (MC + AAQ)

Connections to Prior Units:	**Connections to Future Units:**
• An emphasis is placed on Unit 1 which helps to explain the biological causes and treatments for psychological disorders. The topic of neurotransmission is reviewed to explain this biological impact on disorders.	•
Family Overview (link below)	**Pacing for Unit**
	• 13 classes, 5 weeks
Integration of Technology:	**Aligned Unit Materials, Resources, and Technology:**
•	•
Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
•	• Based on popular media portrayals, students may believe that schizophrenia is the same as split personality disorder, without realizing that one is a split from reality, not a split into multiple personalities. • Students may believe that Obsessive Compulsive Disorder is just about being very neat, organized, or peculiar. Although the term "OCD" is often used this was in everyday language, the clinical diagnosis involves obsessions and compulsions that are significantly more severe, causing impairments to social,

	occupational, or other forms of functioning.
Differentiation through *Universal Design for Learning*	
UDL Indicator • Checkpoint 3.2: Highlight patterns, critical features, big ideas, and relationships.	**Teacher Actions:** • Use or have students create tables/charts that compare and contrast different categories of disorders • Create a matrix that outlines different therapeutic approaches, their core principles, key techniques, and the types of disorders they are commonly used for. • At the end of discussing a category of disorders or a set of treatment approaches, work with students to summarize the overarching themes, the "big ideas" about how psychologists approach these topics, and the critical distinctions to remember.
Supporting Multilingual/English Learners	
Related *CELP standards:* •	**Learning Targets:** • Level 1: With prompting and supports, I can participate in short conversational exchanges about how someone might feel or act, by responding to simple yes/no questions involving using some basic domain-specific vocabulary. • Level 2: With prompting and supports, I can participate in short conversational exchanges about how someone might feel or act, by presenting information/ideas and responding to wh- questions. • Level 3: With guidance and supports, I can participate in conversations about different psychological perspectives on disorders, build on the ideas of others, express my own ideas, and add relevant information. • Level 4: I can participate in discussions and written exchanges on how various psychological perspectives explain disorders, building on others' ideas, expressing my own ideas clearly, and asking and answering questions to clarify different explanations. • Level 5: I can participate in extended conversations and discussions analyzing how different psychological perspectives explain disorders, building on others' ideas, expressing my own ideas clearly, referring to specific and relevant evidence, and asking questions that probe reasoning about these explanations.

Unit 5: Mental and Physical Health

Lesson Map

Lesson	Learning Target	Success Criteria	Vocabulary
Lesson 1 Topic 5.1	• Explain how health psychology addresses issues of physical health and wellness as they apply to behavior and mental processes. • Explain how stress impacts behavior and mental processes.	• I can explain the significant causes of stress, the body's physical and mental reaction to stress, as well as ways in which individuals cope with stress.	Health psychology Stress Hypertension Immune suppression Stressors Eustress (motivating) Distress (debilitating) Adverse childhood experiences (ACEs) General adaptation syndrome (GAS) Alarm reaction phase Resistance phase Flight-flight-freeze response Exhaustion phase Tend and befriend theory Problem focused coping Emotion focused coping
Lesson 2 Topic 5.2	• Explain how positive psychology approaches the study of behavior and mental processes. • Explain how positive subjective experiences apply to behavior and mental processes.	• I can define and apply various positive psychology techniques which can improve an individual's physical and mental wellbeing.	Positive psychology Well-being Resilience Positive emotions Gratitude Positive subjective experiences Subjective well-being Signature strengths Virtues Positive objective experiences Happiness Subjective well-being Categories of virtues Posttraumatic growth

Lesson 3 Topic 5.3	• Describe the approaches used to define behaviors and mental processes as psychological disorders. • Explain how psychological perspectives define psychological disorders.	• I can compare various ways psychological disorders are defined and explained through different psychological perspectives.	Dysfunction Distress Deviation from norms Cultural/societal norms Stigma Racism Sexism Ageism Discrimination Diagnostic and Statistical Manual of Mental Disorders (DSM) International Classification of Diseases (ICD) Eclectic approach Behavioral perspective Maladaptive learned associations Psychodynamic perspective Humanistic perspective Cognitive perspective Evolutionary perspective Sociocultural perspective Biological perspective Biopsychosocial model
Lesson 4 Topic 5.3	• Explain how interaction models define psychological disorders.	• I can explain how a combination of factors can work together to lead to a psychological disorder.	Diathesis-stress model
Lesson 5 Topic 5.4	• I can compare neurodevelopmental and schizophrenic spectrum disorders.	• I can define neurodevelopmental and schizophrenic disorders. • I can describe the symptoms of neurodevelopmental and schizophrenic disorders. • I can explain the causes of neurodevelopmental and schizophrenic disorders.	Neurodevelopmental disorders Attention-deficit/hyperactivity disorder (ADHD) Autism Spectrum Delusions Delusions of persecution Delusions of grandeur Hallucinations Word salad Catatonia Flat affect Catatonic stupor Dopamine hypothesis

			Schizophrenic Spectrum Disorders Delusions Hallucinations Disorganized thinking Disorganized speech Disorganized motor behavior Negative symptoms Positive symptoms
Lesson 6 Topic 5.4	• I can compare depressive and anxiety disorders.	• I can define depressive and anxiety disorders. • I can describe the symptoms of depressive and anxiety disorders. • I can explain the causes of depressive and anxiety disorders.	Depressive disorders Major Depressive Disorder Persistent Depressive Disorder Bipolar disorders Cycling Mania Depression Bipolar I Disorder Bipolar II Disorder Anxiety disorders Taijin kyofusho Generalized anxiety disorder (GAD)
Lesson 7 Topic 5.4	• I can compare dissociative and obsessive-compulsive disorders.	• I can define dissociative and obsessive-compulsive disorders. • I can describe the symptoms of dissociative and obsessive-compulsive disorders. • I can explain the causes of dissociative and obsessive-compulsive disorders.	Obsessive-compulsive personality disorder Obsessions Compulsions Hoarding disorder Disorder (ASD) Dissociative disorders Dissociation Dissociative amnesia Dissociative identity disorder
Lesson 8 Topic 5.4	• I can compare stressor-related, feeding and eating, and personality disorders.	• I can define stressor-related, feeding and eating, and personality disorders.. • I can describe the symptoms of stressor-related, feeding and eating, and personality disorders..	Paranoid personality disorder Schizoid personality disorder Schizotypal personality disorder Cluster B (dramatic, emotional, or erratic cluster) Antisocial personality disorder

		• I can explain the causes of stressor-related, feeding and eating, and personality disorders.	Histrionic personality disorder Narcissistic personality disorder Borderline personality disorder Cluster C (anxious or fearful cluster) Avoidant personality disorder Dependent personality disorder Personality disorders Cluster A (odd or eccentric cluster) Feeding and eating disorders Anorexia nervosa Bulimia nervosa Specific phobia Acrophobia Arachnophobia Agoraphobia Panic disorder Panic attack Ataque de nervious Social anxiety disorder
Lesson 9 Topic 5.5	• I can explain the various ways in which psychological disorders are treated.	• Describe research and trends in the treatment of psychological disorders. • Describe ethical principles in the treatment of psychological disorders.	Evidence-based interventions Cultural humility Therapeutic alliance Psychotropic medication Nonmaleficence Fidelity & Integrity Respect for people's rights and dignity Psychodynamic therapies Free association Dream interpretation Cognitive therapies Cognitive restructuring Fear hierarchies Combating maladaptive thinking Cognitive triad Applied behavior analysis Exposure therapies Systematic desensitization Aversion therapies Token economies

Lesson 10	• I can compare cognitive, behavioral, and humanistic therapies. • Explain how group therapy is different from individual therapy.	• Describe techniques used with psychological therapies. • Describe effective uses of hypnosis. • Describe interventions derived from the biological perspective.	Biofeedback Cognitive-behavioral therapies Dialectical behavior therapy Rational emotive behavior therapy (REBT) Person-centered therapy Active listening Unconditional positive regard Group therapy Hypnosis Psychoactive medication Antidepressants Antianxiety drugs Lithium Antipsychotic medications Tardive dyskinesia Psychosurgery Lesioning TMS (transcranial magnetic stimulation) Electroconvulsive therapy Lobotomy
Lesson 11	• Progress Check/Review		
Lesson 12	• EOU Assessment		
Lesson 13	• Flex		

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Grade 5 Mathematics	Math	5	N/A

Course Description:

The big ideas in grade 5 include: developing fluency with addition and subtraction of fractions, developing understanding of multiplication and division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions), extending division to two-digit divisors, developing understanding of operations with decimals to hundredths, developing fluency with whole number and decimal operations, and developing understanding of volume.

Aligned Core Resources:	Connection to the *BPS Vision of the Graduate*
Illustrative Math 360	**Collaboration** • Demonstrates ability to work effectively and respectfully with diverse teams • Assume shared responsibility for collaborative work and value the individual contributions made by each team member **Communication** • Articulates thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts • Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions **Critical Thinking and Problem Solving** • Collect, assess and analyze relevant information • Reason effectively. Identify, define and solve authentic problems and essential questions • Reflect critically on learning experience, processes and solutions • Transfer knowledge to other situations

Additional Course Information: *Knowledge/Skill Dependent courses/prerequisites*	Link to *Completed Equity Audit*
N/A	Grade 5 Math Completed Equity Audit

Standard Matrix

M-Major Cluster, S-Supporting Cluster, A-Additional Cluster

District Learning Expectations and Standards	U1	U2	U3	U4	U5	U6	U7	U8
Operations and Algebraic Thinking								
Write and interpret numerical expressions.								
5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	A			A	A			
5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.	A	A		A	A		A	

Analyze patterns and relationships.								
5.OA.B.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.							A	
Write and interpret numerical expressions.								
5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	A			A	A			
5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.	A	A		A	A		A	
Number and Operations in Base Ten								
Understand the Place Value System								
5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.					M	M		
5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.						M		
5.NBT.A.3 Read, write, and compare decimals to thousandths.					M			
5.NBT.A.3.A Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).					M			
5.NBT.A.3.B Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.					M			

5.NBT.A.4 Use place value understanding to round decimals to any place.					M			
Perform operations with multi-digit whole numbers and with decimals to hundredths.								
5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.				M				
5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				M				M
5.NBT.B.7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.					M			
Number and Operations - Fractions								
Use equivalent fractions as a strategy to add and subtract fractions.								
5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.						M		M
5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.						M		
Apply and extend previous understandings of multiplication and division.								
5.NF.B.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by		M						

4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?								
5.NF.B.4.A Interpret the product (a/b) × q as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = (ac)/(bd).		M	M					
5.NF.B.4.B Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.		M	M					
5.NF.B.5 Interpret multiplication as scaling (resizing), by:						M		
5.NF.B.5.A Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.						M		
5.NF.B.5.B Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n × a)/(n × b) to the effect of multiplying a/b by 1.						M		
5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.			M			M		
5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.			M					
5.NF.B.7.A Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between			M					

multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.								
5.NF.B.7.B Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.			M					
5.NF.B.7.C Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?			M					
Measurement and Data								
Convert like measurement units within a given measurement system.								
5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.						S		
Represent and interpret data.								
5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.						S		
Geometric measurement: understand concepts of volume.								
5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.	M			M				M
5.MD.C.3.A A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.	M							
5.MD.C.3.B A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.	M							

5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	M							
5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.	M			M				M
5.MD.C.5.A Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.	M							
5.MD.C.5.B Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	M			M				
5.MD.C.5.C Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	M							
Geometry								
Graph points on the coordinate plane to solve real-world and mathematical problems.								
5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).							A	
5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.							A	
Classify two-dimensional figures into categories based on their properties.								
5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that							A	A

category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.								
5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.							A	A

Unit Links

Unit 1: Finding Volume
Unit 2: Fractions as Quotients and Fraction Multiplication
Unit 3: Multiplying and Dividing Fractions
Unit 4: Wrapping Up Multiplication and Division with Multi-Digit Numbers
Unit 5: Place Value Patterns and Decimal Operations
Unit 6: More Decimal and Fraction Operations
Unit 7: Shapes on the Coordinate Plane

Unit Title

Unit 1: Finding Volume

Relevant Standards: Bold indicates priority

5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
5.MD.C.3.A A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
5.MD.C.3.B A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.
5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
5.MD.C.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
5.MD.C.5.A Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
5.MD.C.5.B Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
5.MD.C.5.C Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems

<table>
<tr><th>Essential Question(s):</th><th>Enduring Understanding(s):</th></tr>
<tr><td>

- What does volume measure in a solid figure?
- How can we represent mathematical situations?

</td><td>

- Volume is an attribute of a three-dimensional solid figure that is measured in cubic units.
- Volume can be measured (or determined) by finding the total number of cubic units required to fill the space without gaps or overlaps
- The area of a base of a rectangular prism is found by multiplying the length by width ($b = \ell \times w$).
- In a right rectangular prism, any two parallel faces can be the bases.
- The volume of a rectangular prism can be found by multiplying the length by width by height ($\ell \times w \times h$) or by multiplying the area of the base by height ($b \times h$).
- A figure composed of rectangular prisms may be decomposed into two non- overlapping rectangular prisms whose volumes may be added to find the volume of the figure.
- Parentheses and brackets can be used in writing expressions to group numbers and operations together. There are multiple ways to write equivalent expressions to represent a given situation.
- There is a specific convention used to interpret and evaluate expressions. The information within parentheses and brackets are evaluated first.

</td></tr>
<tr><th>Demonstration of Learning:</th><th>Pacing for Unit</th></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>20 days (11 required lessons, 7 flex, 2 assessment and reaction)</td></tr>
<tr><th>Family Overview (link below)</th><th>Integration of Technology:</th></tr>
<tr><td>Family Support Video Unit 1
Family Support Materials Unit 1 (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><th>Unit-specific Vocabulary:</th><th>Aligned Unit Materials, Resources, and Technology (beyond core resources):</th></tr>
<tr><td>

expression	parentheses	variable
interpret	volume	cubic units
multiplication	addition	rectangular prism
length	width	height

</td><td>ST Math
District - approved online resources</td></tr>
</table>

base area	formula	measurement
attribute	solid figure	unit cube
gap	overlap	cubic units
three-dimensional	space	solid figure
Associative property	Distributive property	Commutative property
decompose	composite	additive

Opportunities for Interdisciplinary Connections:	**Anticipated Conceptions:**
Grade 5 Science Unit 1: • Measuring volumes of different states of matter • Comparing volumes before and after mixing substances - Understanding conservation of matter through volume measurements Grade 5 Science Unit 3: • Measuring volumes of water in different reservoirs • Understanding distribution of Earth's water	When students hear the word volume, they often think of sound. Students will need real world examples of mathematical volume as well as hands-on experiences in order to fully grasp this concept. Students may think that rotating a prism changes its volume, not understanding that volume remains constant regardless of orientation. By stacking geometric solids with cubic units in layers, students can begin understanding the concept of how addition plays a part in finding volume. This will lead to an understanding of the formula for the volume of a right rectangular prism, b × h, where b is the area of the base. Students may think the term “base” only applies to the bottom layer of a prism rather than any two parallel faces. When solving the volume of composite shapes, students often struggle to properly visualize the shape as two separate rectangular prisms. They may also believe a prism can only be decomposed in one way, or have difficulty determining the lengths of the various sides of the composite shape.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3 Unit 2	Grade 5 Unit 4 Grade 6 Unit 1
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement:- **Welcoming Interests & Identities** • Optimize relevance, value, and authenticity(7.2) • Nurture joy and play (7.3)	See Illustrative Math Teachers Guide for identified “Access for Students with Disabilities” by lesson and activity.

Representation - Access for Perception • Support multiple ways to perceive information (1.2) **Engagement - Sustaining Effort** • Foster collaboration, interdependence and collective learning (8.3)	

Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze** and **critique** the arguments of others orally and in writing.(4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 1 Planning Map		
Section A	I can find the volume of a rectangular prism by counting unit cubes. ☐ Describe attributes of rectangular prisms composed of connecting cubes. ☐ Explain strategies for determining the volume of a solid object composed of unit cubes. ☐ Generalize that the volume of a rectangular prism composed of unit cubes is the product of the number of cubes in one layer and the total number of layers. ☐ Interpret a multiplication expression that represents the volume of a rectangular prism composed of unit cubes.	Cool downs Section Checkpoints Practice problems
Section B	I can apply a formula to find the volume of a rectangular prism. ☐ Understand that a "base" of a rectangular prism is a face of the prism. ☐ Describe how a multiplication expression represents the volume of a rectangular prism composed of unit cubes. ☐ Determine the volume of a rectangular prism, given a base and a corresponding height. ☐ Understand that the "length, the width, and the height" of a rectangular prism refer to the side lengths of the prism. ☐ Generate expressions that represent the volume of a rectangular prism. ☐ Understand that a "cubic unit" is the volume of a cube of side length 1 unit. ☐ Determine the information needed to find the volume of a rectangular prism. ☐ Identify appropriate stand units of measure for volume and justify the selection.	
Section C	I can find the volume of a figure composed of rectangular prisms.	

	☐ Explain strategies for calculating the volume of a figure composed of rectangular prisms, with visible unit cubes. ☐ Explain strategies for calculating the volume of a figure composed of rectangular prisms,in which unit cubes are not visible. ☐ Interpret an expression that represents the volume of a figure composed of rectangular prisms. ☐ Determine the volume of a figure composed of rectangular prisms and represent it with an expression. ☐ Explain strategies for finding the volumes of figures in real-world and mathematical problems.	

Unit Title:
Unit 2: Fractions as Quotients and Fraction Multiplication
Relevant Standards: Bold indicates priority
5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. **5.NF.B.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?** **5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.** **5.NF.B.4.A Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = (ac)/(bd).** **5.NF.B.4.B Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.**

Essential Question(s):	**Enduring Understanding(s):**
• How is a fraction related to division? • How does whole number computation relate to fraction computation? • How can models help us understand the multiplication and division of fractions?	• We can interpret a fraction as a division problem, where the numerator is divided by the denominator. • The denominator describes what number of equal parts a whole has been divided into. The numerator describes how many of the parts are considered. The numerator is a multiplier, e.g., $4/5 = 4 \times 1/5$. • A fraction represents division, so $a \div b = a/b$, e.g., $3 \div 4 = 3/4$. The denominator is the divisor. The numerator is the dividend. • Equal shares means each sharer gets the same sized part and no parts are discarded. The solution to an equal sharing problem can be shown with a fraction representing the relationship of the sharers and the amount. • The idea of the numerator as a multiplier can be used when a fraction is being multiplied by a whole number, e.g., Just as $5/8 = 5 \times 1/8$, 5 groups of 3/8 equals $5 \times 3/8 = (5 \times 3) \times 1/8$ which equals 15/8. • A variety of models, including arrays, number lines, fraction strips, etc. can be used to represent the multiplication of a whole number by a fraction. • The properties of whole number computation can be applied to computation with fractions.

Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	Unit Pacing: 25 days (15 required lessons, 8 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
Family Support Video Unit 2 Family Support Materials Unit 2 (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
<table><tr><td>expression</td><td>parentheses</td><td>variable</td></tr><tr><td>evaluate</td><td>interpret</td><td>fraction</td></tr><tr><td>mixed number</td><td>numerator</td><td>denominator</td></tr><tr><td>equal parts</td><td>interpret</td><td>solve</td></tr><tr><td>product</td><td>partition</td><td>equivalent</td></tr><tr><td>factor</td><td>unit fraction</td><td>area</td></tr><tr><td>side lengths</td><td>division</td><td>dividend</td></tr><tr><td>divisor</td><td>quotient</td><td>represent</td></tr></table>	ST Math District - approved online resources
Opportunities for Interdisciplinary Connections:	**Anticipated Conceptions:**
Grade 5 Social Studies Unit 1: • Relating fractions to colonies and fractions of colonists affected by hardships Grade 5 Science Unit 3: • Understanding part-whole relationships - Analyzing distribution of Earth's water - Representing data with fractional quantities - Calculating percentages of resources	Students may believe that you can not divide a smaller number by a larger number. (i.e. 3 ÷ 4 = ¾). When creating a model to represent fraction multiplication and division situations, students do not correctly attend to the whole. When working with contextual problems, students may not attend to the meaning of the numerals in the problem in relation to the operation involved. Students may believe that multiplication always results in a larger number (i.e. 2 x 8 = 16 vs. ½ x 8 = 4).
Connections to Prior Units:	**Connections to Future Units:**
Grade 3 Unit 2 Grade 3 Unit 4 Grade 4 Unit 3	Grade 5 Unit 3

Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation - Access for Perception • Support opportunities to customize display of information (1.1) • Support multiple ways to perceive information (1.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze** and **critique** the arguments of others orally and in writing.(4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 2 Planning Map		
Section A	I can interpret and represent a fraction as a division problem. ☐ Explain a strategy for solving a whole-number division story problem with a solution that is a fraction. ☐ Interpret a diagram that represents a whole-number division story problem with a solution that is a fraction. ☐ Use a whole-number division expression to represent a story problem with a solution that is a fraction. ☐ Use a division equation to represent a whole-number division story problem with a solution that is a fraction. ☐ Explain a strategy for solving an unknown factor, whole number division story problem with a solution that is a fraction. ☐ Interpret division situations and equations where the unknown is the numerator, denominator of the value of the quotient.	Cool downs Section Checkpoints Practice problems

Section B	I can represent a fraction x whole number with a model and solve to find the product. ☐ Describe how equivalent multiplication and division expressions can represent the same diagram. ☐ Use a diagram to represent a whole number division story problem with a rational solution. ☐ Describe how a fraction and different, equivalent expressions, represent the same diagram. ☐ Explain a strategy for determining the product of a whole number and a fraction.	
Section C	I can find the area of a rectangle with fractional side lengths. ☐ Explain a strategy for determining the area of a rectangle with a whole number side length and a unit fraction side length. ☐ Determine the area of a rectangle with a whole number side length and a rational side length less than 1 and represent it with a multiplication expression. ☐ Describe how different equivalent multiplication expressions represent the area of a given rectangle with fraction side lengths greater than 1. ☐ Explain strategies used to determine the area of a rectangle with fractional side lengths and represent the area with a multiplication expression. ☐ Explain strategies for determining the area of a rectangle with fractional side lengths greater than 1 by decomposing it. ☐ Interpret the area of a rectangle which includes a fractional side length expressed as a mixed number. ☐ Identify different numerical expressions that represent the same area of a rectangle with fractional side lengths greater than 1. ☐ Determine what information is needed to solve a multi-step area problem involving multiplication of a whole number and a fraction. ☐ Explain strategies for determining unknown factors or products in area contexts that involve a mixed number.	

Unit Title:
Unit 3: Multiplying and Dividing Fractions
Relevant Standards: Bold indicates priority
5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. **5.NF.B.4.A Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = (ac)/(bd).** **5.NF.B.4.B Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.** **5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.** **5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.** **5.NF.B.7.a Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.** **5.NF.B.7.b Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.** **5.NF.B.7.c Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?**

Essential Question(s):	**Enduring Understanding(s):**
• How can models help us understand the multiplication and division of fractions? • How does whole number computation relate to fraction computation?	• A variety of models, including arrays, number lines, fraction strips, etc. can be used to represent the multiplication of a whole number by a fraction. • The relationship between multiplication and division can help us reason about fraction division. Contextual situations are also imperative to help students reason about the computation. • A variety of models, including arrays, number lines, fraction strips, etc. can be used to represent the multiplication of a whole number by a fraction. • The properties of whole number computation can be applied to computation with fractions. • Solving word problems with addition, subtraction, multiplication and division of fractions follow the same problem solving structures as for whole number situations.

<table>
<tr><th>Demonstration of Learning:</th><th>Pacing for Unit</th></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>Unit Pacing: 28 days (17 required lessons, 9 flex, 2 assessment and reaction)</td></tr>
<tr><th>Family Overview (link below)</th><th>Integration of Technology:</th></tr>
<tr><td>Family Support Video Unit 3
Family Support Materials Unit 3 (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><th>Unit-specific Vocabulary:</th><th>Aligned Unit Materials, Resources, and Technology (beyond core resources):</th></tr>
<tr><td>
<table>
<tr><td>fraction</td><td>numerator</td><td>denominator</td></tr>
<tr><td>product</td><td>partition</td><td>equal parts</td></tr>
<tr><td>quotient</td><td>division</td><td>equivalent</td></tr>
<tr><td>factor</td><td>unit fraction</td><td>area</td></tr>
<tr><td>side lengths</td><td></td><td></td></tr>
</table>
</td><td>ST Math
District - approved online resources</td></tr>
<tr><th>Opportunities for Interdisciplinary Connections:</th><th>Anticipated Conceptions:</th></tr>
<tr><td>Grade 5 Social Studies Unit 1:
• Relating fractions to colonies and fractions of colonists affected by hardships

Grade 5 Science Unit 1:
• Finding parts of mixtures - Determining proportions in materials - Calculating material proportions - Planning and testing solutions</td><td>Students may believe that multiplication always results in a
larger number (i.e. 2 x 8 = 16 vs. ½ x 8 = 4). Students may believe that you can not divide a smaller number by a larger number. (i.e. 3 ÷ 4 = ¾).

When creating a model to represent fraction multiplication and division situations, students do not correctly attend to the whole.

When working with contextual problems, students may not attend to the meaning of the numerals in the problem in relation to the operation involved.

The idea of the numerator as a multiplier can be used when a fraction is being multiplied by a whole number, e.g., Just as 5/8 = 5× 1/8 , 5 groups of 3/8 equals 5 × 3/8 = (5×3)× 1/8 which equals 15/8.</td></tr>
<tr><th>Connections to Prior Units:</th><th>Connections to Future Units:</th></tr>
<tr><td>Grade 3 Unit 4
Grade 4 Unit 3</td><td>Grade 6 Unit 4</td></tr>
<tr><th colspan="2">Differentiation through Universal Design for Learning</th></tr>
<tr><th>UDL Indicator</th><th>Teacher Actions:</th></tr>
</table>

Representation-Perception • Support multiple ways to perceive information (1.2) **Action and Expression - Expression & Communication** • Build fluencies with graduated support for practice and performance (5.3)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze** and **critique** the arguments of others orally and in writing.(4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 3 Planning Map		
Section A	I can represent a fraction multiplication problem using models and equations and solve to find the product. I can find the area of a rectangle with fractional side lengths. ☐ Represent a unit fraction of a unit fraction of a whole with a diagram and interpret the diagram. ☐ Describe how diagrams and expressions represent the product of 2 unit fractions. ☐ Calculate the product of 2 unit fractions. ☐ Interpret a diagram and an equation that represent the product of 2 unit fractions. ☐ Represent a diagram with a multiplication expression involving a unit fraction and a non-unit fraction to represent a diagram in context. ☐ Explain strategies to determine the product of a unit fraction and a non-unit fraction. ☐ Represent the product of a unit fraction and a non-unit fraction with diagrams and expressions and interpret the representations. ☐ Determine the product of 2 non unit fractions represented by a diagram. ☐ Calculate the product of 2 fractions. ☐ Interpret a diagram that represents the product of 2 mixed numbers. ☐ Explain strategies for finding the product of fractions or mixed	Cool downs Section Checkpoints Practice problems

	numbers. ☐ Interpret a fraction multiplication equation that represents an area in context.	
Section B	I can represent a fraction division problem using models and equations and solve to find the quotient. ☐ Generalize how the size of the dividend or divisor affects the size of the quotient. ☐ Describe how a diagram and division expression represent a unit fraction divided by a whole number in context. ☐ Represent a unit fraction divided by a whole number in a context with a diagram. ☐ Represent a situation with an equation involving the division of a whole number by a unit fraction and interpret the equation ☐ Compare and contrast diagrams and equations that represent dividing a whole number by a fraction. ☐ Generate a situation to represent a division expression with a whole number and a unit fraction. ☐ Explain strategies for determining whether a quotient involving a whole number and a unit fraction is greater than or less than 1.	
Section C	I can solve problems involving fraction multiplication and division. ☐ Determine what information is needed to solve fraction multiplication or division problems in context. ☐ Solve fraction multiplication and division problems in context. ☐ Generate both multiplication and division equations to represent situations in context. ☐ Justify that either a division or a multiplication equation can represent the same situation.	

Unit Title:	
Unit 4: Wrapping Up Multiplication and Division with Multi-Digit Numbers	
Relevant Standards: Bold indicates priority	
5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. 5.OA.A.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. **5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.** **5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.** **5.MD.C.5.B Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.**	
Essential Question(s):	**Enduring Understanding(s):**
• How can understanding place value help us? • How do the properties of operations make computation simpler? • How are multiplication and division related? • How can we represent mathematical situations?	• Understanding place value enables us to represent, compare order and round numbers and perform computations. • Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. • There are different algorithms that can be used to multiply. • Real-world mathematical situations can be represented using concrete models or drawings. • Patterns and structures can be generalized when multiplying and dividing whole numbers. • There is a relationship between multiplication and division. • Equations, rectangular arrays, and/or area models can be used to illustrate and explain division. • Real-world mathematical situations can be represented using concrete models or drawings.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	Unit Pacing: 28 days (18 required lessons, 8 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
Family Support Video Unit 4 Family Support Materials Unit 4 (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*

Unit-specific Vocabulary:			Aligned Unit Materials, Resources, and Technology (beyond core resources):
expression	parentheses	algorithm	ST Math District - approved online resources
Standard algorithm	evaluate	variable	
interpret	Distributive property	volume	
cubic units	multiplication	addition	
rectangular prism	base area	formula	
factors	product	rectangular arrays	
partial products	quotient	dividend	
divisor	calculate	Associative property	
Commutative property	decompose	length	
width	height		

Opportunities for Interdisciplinary Connections:	Anticipated Conceptions:
Grade 5 Science Unit 1: • Computing volumes of different materials - Measuring and comparing substance quantities - Analyzing conservation of matter through volume	When students don't attend to place value, they may not understand the magnitude of the numbers they are multiplying or dividing and therefore make computational errors. When working with contextual problems, students may not attend to the meaning of the numerals in the problem in relation to the operation involved.
Connections to Prior Units:	**Connections to Future Units:**
Grade 4 Unit 6	Grade 5 Unit 5

Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Building Knowledge • Connect prior knowledge to new learning (3.1) **Action and Expression - Expression & Communication** • Build fluencies with graduated support for practice and performance (5.3)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.

Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze** and **critique** the arguments of others orally and in writing.(4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 4 Planning Map		
Section A	I can solve multi-digit multiplication problems using the standard algorithm. ☐ Describe strategies for multiplying multi-digit numbers. ☐ Explain strategies for estimating products. ☐ Interpret diagrams that represent the product of a two-digit and a three-digit number. ☐ Label diagrams to represent the product of a two-digit number a a three-digit number and find the value. ☐ Interpret different ways to record partial products. ☐ Show how partial products can be used to multiply multi digit numbers. ☐ Explain how using partial products relates to using the standard algorithm when multiplying multi-digit numbers. ☐ Interpet the steps in the standard algorithm used to multiply multi-digit numbers. ☐ Use the standard algorithm to multiply multi-digit numbers without composing new units. ☐ Use the standard algorithm to multiply multi-digit numbers with composing new units. ☐ Solve real-world multiplication problems.	Cool downs Section Checkpoints Practice problems
Section B	I can represent and solve multi-digit division problems. ☐ Explain strategies for dividing a multi-digit number by a one-digit number. ☐ Represent a division situation with an expression . ☐ Identify and interpret expressions that show partial quotients for dividing a three-digit by a two-digit number. ☐ Describe the steps used to divide a three-digit number by a two-digit number, with partial quotients. ☐ Calculate the quotients of three-digit numbers divided by two-digit numbers and explain the strategies used. ☐ Explain strategies for determining if a quotient is reasonable.	

	☐ Divide up to four-digit dividends by two-digit divisors, and compare and contrast the strategies used. ☐ Use the relationship between multiplication and division to solve problems involving area and volume and explain the strategies used.	
Section C	I can apply a formula to find the volume of a rectangular prism. ☐ Explain strategies for estimating products and quotients of multi-digit numbers. ☐ Use multiplication and division of multi-digit numbers to solve problems involving area and volume and explain the reasoning used.	

Unit Title:
Unit 5: Place Value Patterns and Decimal Operations
Relevant Standards: Bold indicates priority
5.OA.A.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. **5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.** **5.NBT.A.3 Read, write, and compare decimals to thousandths.** **5.NBT.A.3.a Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).** **5.NBT.A.3.b Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.** **5.NBT.A.4 Use place value understanding to round decimals to any place.** **5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.**

Essential Question(s):	**Enduring Understanding(s):**
• How is our number system organized? • How can understanding place value help us? • How do the properties of operations make computation simpler?	• Our number system is a base-ten system. A given place value is ten times greater than the value of the place to its right (500 is ten times greater than 50) and 1/10 the value of the place to its left (0.3 is 1/10 the value of 3). • Understanding place value enables us to represent, compare order and round numbers and perform computations. • When reading a decimal number, the decimal point is read as “and”. • In a decimal number, digits to the right of the decimal point are named by the appropriate unit: tenths, hundredths, thousandths. and are read followed by the name of the appropriate unit, i.e. 1.438 is read as one and four hundred thirty eight thousandths. • Decimals to thousandths can be expressed in standard form, word form, and expanded form. • Two decimals to thousandths can be compared using the symbols >, =, and <. • Understanding place value enables us to represent, compare, order and round numbers and perform computations. • Understanding place value enables us to represent, compare order and round numbers and perform computations. These patterns exist for both whole numbers and decimals. • Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. The same

	properties of operations for whole numbers work with decimal numbers.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	Unit Pacing: 35 days (24 required lessons, 9 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
Family Support Video Unit 5 Family Support Materials_Unit 5 (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
pace value / decimal / decimal point tenths / hundredths / thousandths place value chart / greater than > / less than < equal to = / comparison / expanded form round / Associative property / Commutative property Identity property / sum / difference product / quotient / patterns factors / multiples	ST Math District - approved online resources
Opportunities for Interdisciplinary Connections:	**Anticipated Conceptions:**
Grade 5 Science Unit 1: • Relating decimals to measuring and recording masses of substances before/after mixing - recording precise measurements Grade 5 Science Unit 3: • Describing distribution of water on Earth using percentages and decimals	When trying to extend their understanding of whole number place value to decimal place value, students may believe that as you move to the right of the decimal point, the number increases in value, i.e. 6 hundredths is larger than 6 tenths. Students may also try to apply whole number concepts when comparing decimals by looking only at the number of digits. However, with decimals a number with one decimal place may be greater than a number with two or three decimal places. For example, 0.5 is greater than 0.12, 0.009 or 0.499. Students may not attend to place value when adding or subtracting decimals by ignoring the idea that they

	need to add like place values as with whole number addition and subtraction. For example, students might line up decimals to add or subtract from left to right or right to left not attending to the place value of the digits. Students may believe that multiplication always results in a larger product. Students may just perform decimal computation without assessing the reasonableness of their answer. It is essential that students think about the relative magnitude of the numbers in both the problem as well as their answer.
Connections to Prior Units:	**Connections to Future Units:**
Grade 4 Unit 4 Section A Grade 4 Unit 3 Section C Grade 4 Unit 6 Section C	Grade 6 Unit 5
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement - Welcoming Interests & Identities • Optimizing choice and autonomy (7.1) **Engagement - Sustaining Effort** • Foster collaboration, interdependence and collective learning (8.3) **Representation - Building Knowledge** • Connect prior knowledge to new learning (3.1)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze** and **critique** the arguments of others orally and in writing.(4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 5 Planning Map		
Section A	I can read, write, and represent decimals to the thousandths place. ☐ Interpret diagrams that represent 0.1, 0.01 and 0.001.	Cool downs

	☐ Represent decimals to thousandths with a diagram and diagrams with a decimal number. ☐ Represent decimals in expanded form. ☐ Represent decimals on a number line. ☐ Describe relationships between tenths, hundredths and thousandths. I can compare two decimals using the symbols <, > or =. ☐ Explain strategies for comparing decimals. ☐ Use a number line to compare decimals and represent the comparison using the symbols <, >, or =. ☐ Compare decimals and represent the comparison using the symbols <, >, or =. I can round decimals to any place. ☐ Explain strategies for rounding decimal numbers to the nearest whole number, tenth and hundredth. ☐ Use place-value understanding to estimate the location of a decimal to thousandths. ☐ Interpret the impact of rounding decimals in a context.	Section Checkpoints Practice problems
Section B	I can add and subtract decimals to the hundredths using a variety of strategies. ☐ Describe strategies for adding decimal numbers to hundredths. ☐ Use place-value strategies to estimate and calculate the sum of decimals to hundredths. ☐ Explain strategies for adding decimals to hundredths. ☐ Describe strategies for subtracting decimal numbers to hundredths. ☐ Use place-value strategies to estimate and calculate the difference of decimals to hundredths. ☐ Explain strategies for subtracting decimals to hundredths. ☐ Calculate sums and differences of decimals to hundredths and explain the strategies used.	
Section C	I can multiply decimals using a variety of strategies. ☐ Describe strategies for multiplying a 1-digit whole number and a decimal number. ☐ Identify and interpret diagrams and expressions that represent the product of a whole number and a decimal number. ☐ Calculate products of a whole number and a decimal and explain strategies used. ☐ Match decimal multiplication expressions that have equivalent values and justify reasoning. ☐ Calculate the product of 2 decimals to tenths and explain strategies used. ☐ Calculate the product of 2 decimals to hundredths and explain strategies used.	

Section D	I can divide decimals using a variety of strategies. ☐ Explain strategies for dividing a whole number by one tenth or one hundredth. ☐ Generalize that dividing a decimal by one tenth is equivalent to multiplying it by 10. ☐ Generalize that dividing a decimal by one hundredth is equivalent to multiplying it by 100. ☐ Calculate quotients of a decimal divided by tenths or hundredths. ☐ Interpret diagrams and expressions that represent dividing a whole number by tenths or hundredths. ☐ Calculate quotients of a decimal to the hundredths divided by a whole number and explain strategies used. ☐ Calculate quotients of a decimal divided by one tenth or one hundredth and explain the strategies used. ☐ Interpret diagrams that represent dividing a decimal by one tenth or one hundredth.	

Unit Title:
Unit 6: More Decimal and Fraction Operations
Relevant Standards: Bold indicates priority
5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. **5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.** **5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)** **5.NF.A.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*** **5.NF.B.5.a Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.** **5.NF.B.5.b Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n×a)/(n×b) to the effect of multiplying a/b by 1.** **5.NF.B.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.** 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. 5.MD.B.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different

measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

Essential Question(s):	**Enduring Understanding(s):**
• What is the relationship between units of measure in each system? • How can equivalent fractions be used to add and subtract fractions with unlike denominators? • Why do we collect, organize, represent and analyze data? • How is the size of a factor related to the size of the product when multiplying a given fraction?	• Conversions in the U.S. customary system vary depending upon what is being measured. Conversions in the metric system are based on powers of ten. • When converting from a larger unit to a smaller unit, there will be more iterations of the smaller unit. For example, when converting from yards to feet, there will always be a greater number of feet than yards. • When converting from a smaller unit to a larger unit, there will be less iterations of the larger unit. For example, when converting from cups to gallons, there will always be fewer gallons than cups. • Measurements can be converted to solve multi-step real-world problems. • Our number system is a base-ten system. A given place value is ten times greater than the value of the place to its right (500 is ten times greater than 50) and 1/10 the value of the place to its left (0.3 is 1/10 the value of 3). • In the base-ten system, the value of each place is 10 times the value of the place to the immediate right and 1/10 of the value to its immediate left. • Equivalent fractions can be used to replace given fractions to make calculations simpler. • We decompose fractions into sums or products of fractions to make computation easier or to simplify expressions. • Fractions can be added and subtracted when the wholes are the same size and the fractional parts (denominators) are the same. • Fractions with different denominators can be added and subtracted by replacing each fraction with an equivalent fraction expressed with a like denominator. • A fraction with a numerator larger than the denominator can be expressed as a mixed number or a fraction greater than one; both are correct representations. • Expressing a mixed number as a fraction, e.g., 2 3/5 = 13/5 , may be useful when solving a fraction problem. • An equation can be used to describe a mathematical situation involving fractions. • Solving word problems with addition, subtraction, multiplication and division of fractions follow the same problem solving structures as for whole number situations. • We can make observations and assumptions about how factors will impact the product based upon the size of one factor compared to the size of the second factor. For example, we can say that 7 x 56 is 7 times as big as 56 without performing the calculation to find the product. The resulting product will be larger than either of the two factors.

<table>
<tr><td></td><td>

- When multiplying a given fraction by a factor, the product will either be greater than, equal to, or less than the fraction depending on how the factor compares to 1.
- We collect, organize, represent, and analyze data in order to answer a question or solve a problem.
- Data can be organized and represented in a picture graph, a bar graph, or a line plot.
- Symbols used in line plots should be consistently spaced and sized for visual accuracy.

</td></tr>
<tr><td>Demonstration of Learning:</td><td>Pacing for Unit</td></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>20 days (11 required lessons, 7 flex, 2 assessment and reaction)</td></tr>
<tr><td>Family Overview (link below)</td><td>Integration of Technology:</td></tr>
<tr><td>Family Support Video Unit 6
Family Support Materials Unit 6 (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><td>Unit-specific Vocabulary:</td><td>Aligned Unit Materials, Resources, and Technology (beyond core resources):</td></tr>
<tr><td>

base	power	exponent
cubed	equivalent fraction	sum
difference	numerator	denominator
unlike denominator	like denominator	factor
product	scaling	convert
measurement units	Metric system	Customary system
mixed numbers	benchmark fractions	estimate
line plot	interpret	data

</td><td>ST Math
District - approved online resources</td></tr>
<tr><td>Opportunities for Interdisciplinary Connections:</td><td>Anticipated Conceptions:</td></tr>
<tr><td>Grade 5 Science Unit 1:

- Converting between measurement scales - Analyzing mixture proportions
- Recording precise measurements in experiments
- Recording and comparing measurements

</td><td>Students may incorrectly evaluate powers of ten, for example thinking 10 to the 2nd power is 20.

Students may not pay attention to the unit of measurement when solving problems that require renaming units. For example, when subtracting 2 inches from 5 feet, students may</td></tr>
</table>

	simply subtract 2 from 5 and say the answer is 3. Students may add or subtract fractions without first finding equivalent fractions with the same denominator. Students may misapply whole number concepts to adding and subtracting fractions, for example treating the numerator and denominator as separate numbers rather than understanding fractions as numbers. Students may not understand that when multiplying a given fraction by a factor, the product can either be greater than, equal to, or less than the fraction depending on how the factor compares to 1.
Connections to Prior Units:	**Connections to Future Units:**
Grade 4 Unit 3 Grade 4 Unit 5	Grade 6 Unit 1 Grade 6 Unit 8
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement - Welcoming Interests & Identities • Optimize relevance and value authenticity (7.2) **Representation - Building Knowledge** • Connect prior knowledge to new learning (3.1)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze** and **critique** the arguments of others orally and in writing.(4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 6 Planning Map		
Section A	I can explain patterns when multiplying and dividing by powers of 10. ☐ Generalize in a multi-digit number pattern, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	Cool downs Section Checkpoints Practice problems

	☐ Use exponential notation to represent powers of ten. I can solve problems involving measurement conversions. ☐ Determine the factor needed to convert from a larger to a smaller metric length unit. ☐ Determine the divisor needed to convert from a smaller to a larger metric length unit. ☐ Explain strategies for solving problems that require the conversion of units of length and/or volume.	
Section B	I can add and subtract fractions with unlike denominators. ☐ Explain strategies for adding and subtracting fractions with unlike denominators when one is a multiple of the other. ☐ Explain strategies for adding and subtracting fractions with unlike denominators when one is not a multiple of the other. ☐ Explain strategies for adding and subtracting mixed numbers. I can solve word problems involving fraction addition and subtraction. ☐ Interpret and add and subtract fractions and mixed numbers in context. I can create line plots to display fractional measurement data, and use the information to solve problems. ☐ Interpret and create line plots with fractions and mixed numbers. ☐ Determine the information needed to answer questions about a line plot with fractions and mixed numbers.	
Section C	I can explain the magnitude (size) of a product based on the factors. ☐ Explain strategies for comparing A x B when A is a fraction and B is a whole number. ☐ Explain strategies for ordering A x B and C x B when A and C are fractions and B is a whole number. ☐ Justify why A x B > B if A>1 and A x B<B if A<1 when A is a fraction and B is a whole number. ☐ Justify why A x B > B if A>1 and A x B<B if A<1 when A and B are fractions.	

Unit Title:
Unit 7: Shapes on the Coordinate Plane
Relevant Standards: Bold indicates priority
5.OA.B.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule “Add 3” and the starting number 0, and given the rule Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).
5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
5.G.B.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.
5.G.B.4 Classify two-dimensional figures in a hierarchy based on properties.

Essential Question(s):	**Enduring Understanding(s):**
How can we describe an object's location in space? How can two-dimensional figures be described, classified and analyzed?	• We analyze patterns to determine how they change and identify relationships. • Ordered pairs generated from given rules can be graphed on a coordinate plane. • Coordinate graphs show relationships between numbers on a coordinate grid. • The coordinate system is created from a horizontal number line (x-axis) and a vertical number line (y-axis) with the intersection of the lines at zero (the origin). • A given point can be located in the plane by using an ordered pair of numbers (x, y). • The origin of the coordinate plane is represented by the ordered pair (0, 0). • The first number in an ordered pair, the x-coordinate or x, indicates how far to travel from the origin in the horizontal direction. • The second number in an ordered pair, the y-coordinate or y, indicates how far to travel in the vertical direction. • Distance is found by counting intervals rather than counting the grid marks. • Real-world situations can be represented by graphing points in the coordinate plane. • Coordinate values can be interpreted in the context of real-world situations. • Shapes can be named and classified by angle measures, side lengths, or the presence or absence of parallel and perpendicular lines.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	20 days (11 required lessons, 7 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**

Family Support Video Unit 7 Family Support Materials_Unit 7 (all languages	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
numerical pattern, rule, ordered pair vertical, horizontal, intersect point, axis, x-axis y-axis, origin, x-coordinate y-coordinate, attribute, category plane figure, quadrilateral, properties two-dimensional, hierarchy, rhombus parallel lines, perpendicular lines, square rectangle, parallelogram, trapezoid	ST Math District - approved online resources
Opportunities for Interdisciplinary Connections:	**Anticipated Conceptions:**
Grade 5 Science: Unit 3: • Graphing hours of daylight in Hartford and Antarctica each month on a coordinate grid	Students may reverse the order of the coordinates when plotting points on a coordinate plane. They count up first on the y-axis and then count over on the x-axis. Students think that when describing geometric shapes and placing them in subcategories, the last category is the only classification that can be used. When students are asked to describe the relationship between two patterns, they may focus on each pattern in isolation instead of looking for a multiplicative relationship between the two.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3 Unit 5 Grade 4 Unit 6 Grade 4 Unit 8	Grade 6 Unit 7
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**

Representation - Language and Symbols • Clarify vocabulary, symbols, and language structures (2.1) **Action and Expression - Expression & Communication** • Use multiple tools for construction, composition and creativity (5.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze** and **critique** the arguments of others orally and in writing.(4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 7 Planning Map		
Section A	I can identify and plot points on a coordinate grid. ☐ Ask questions to identify a specific shape on a coordinate grid. ☐ Describe a shape on a coordinate grid. ☐ Determine the coordinates of a point in a coordinate grid. ☐ Draw the label points in the coordinate plane. ☐ Generalize that when two points have the same first coordinate they lie in the same vertical line.	Cool downs Section Checkpoints Practice problems
Section B	I can classify shapes in a hierarchy based on properties. ☐ Ask questions to identify specific quadrilateral ☐ Determine and describe attributes of rectangles, rhombuses, squares, trapezoids, and parallelograms. ☐ Compare and contrast two different quadrilaterals with the same perimeter. ☐ Determine the relationships between rectangles, rhombuses, squares, trapezoids, and parallelograms. ☐ Describe attributes of right triangles. ☐ Match triangles based on given attributes.	
Section C	I can generate a pattern based on a given rule. ☐ Use additive rules to determine a sequence of values. ☐ Draw the graph of a set of coordinate pairs. ☐ Determine coordinates for points in a plane based on numerical patterns.	

	☐ Interpret the coordinates of a point in context. ☐ Represent information about a context as a point in the coordinate plane. I can identify and describe the relationships and corresponding terms in two patterns. ☐ Generalize the relationship between two sequences generated from additive rules. ☐ Represent the relationship between the length and width of a rectangle with a fixed area (or perimeter) in the coordinate plane.	

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Grade 3 Mathematics	Math	3	

Course Description:

The big ideas in grade 3 include: developing understanding of multiplication and division and strategies for multiplication and division within 100; developing understanding of fractions, especially unit fractions (fractions with numerator 1); developing understanding of the structure of rectangular arrays and of area; and describing and analyzing two-dimensional shapes.

Aligned Core Resources:	Connection to the *BPS Vision of the Graduate*
Illustrative Math 360	**Collaboration** ● Demonstrates ability to work effectively and respectfully with diverse teams ● Assume shared responsibility for collaborative work and value the individual contributions made by each team member **Communication** ● Articulates thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts ● Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions **Empathy** ● Listening with an open mind to understand others' situations. **Content Mastery** ● Develop and draw from a baseline understanding of knowledge in academic disciplines from our Bristol curriculum **Critical Thinking and Problem Solving** ● Collect, assess and analyze relevant information ● Reason effectively. Identify, define and solve authentic problems and essential questions ● Reflect critically on learning experience, processes and solutions ● Transfer knowledge to other situations
Additional Course Information: ***Knowledge/Skill Dependent courses/prerequisites***	**Link to *Completed Equity Audit***
N/A	Grade 3 Math Completed Equity Audit

Standard Matrix

M-Major Cluster, S-Supporting Cluster, A-Additional Cluster

District Learning Expectations and Standards	U1	U2	U3	U4	U5	U6	U7	U8
Operations and Algebraic Thinking								
Represent and solve problems involving multiplication and division.								

3.OA.A.1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*	M							M
3.OA.A.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.				M				
3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	M			M		M		M
3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 =?	M			M				
Understand properties of multiplication and the relationship between multiplication and division.								
3.OA.B.5 Apply properties of operations as strategies to multiply and divide. Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)	M	M	M	M				
3.OA.B.6 Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.				M				M
Multiply and divide within 100.								
3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.				M				M
Solve problems involving the four operations, and identify and explain patterns in arithmetic.								

3.OA.D.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.			M	M			M	M
3.OA.D.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.	M	M	M	M				
Number and Operations in Base Ten								
Use place value understanding and properties of operations to perform multi-digit arithmetic.								
3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.			A					
3.NBT.A.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.			A					A
3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.				A				
Number and Operations - Fractions								
Develop understanding of fractions as numbers.								
3.NF.A.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a part of size 1/b.					M			M
3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.					M			M
3.NF.A.2.A Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.					M	M		M
3.NF.A.2.B Represent a fraction a/b on a number line diagram by marking off a length 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.					M			M

3.NF.A.3.A Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.					M			M
3.NF.A.3.B Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.					M			M
3.NF.A.3.C Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.					M	M		M
3.NF.A.3.D Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.					M			M
Measurement and Data								
Solve problems involving measurement and estimation.								
3.MD.A.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.						M		
3.MD.A.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.						M		
Represent and interpret data.								
3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	S							S
3.MD.B.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.						S		S

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.								
3.MD.C.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.		M						
3.MD.C.5.A A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.		M						
3.MD.C.5.B A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.		M						
3.MD.C.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).		M						
3.MD.C.7 Relate area to the operations of multiplication and addition.		M		M				
3.MD.C.7.A Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.		M		M				
3.MD.C.7.B Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.		M						M
3.MD.C.7.C Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.				M				
3.MD.C.7.D Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.		M						M
Geometric measurement: recognize perimeter.								
3.MD.D.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters							A	A
Geometry								
Reason with shapes and their attributes.								

3.G.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.							S	S
3.G.A.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.					S			

Unit Links

Unit 1: Introducing Multiplication
Unit 2: Area and Multiplication
Unit 3: Wrapping Up 1,000
Unit 4: Relating Multiplication to Division
Unit 5: Fractions as Numbers
Unit 6: Measuring Length, Time, Liquid Volume and Weight
Unit 7: Two-dimensional Shapes and Perimeter

Unit Title:

Unit 1: Introducing Multiplication

Relevant Standards: Bold indicates priority

3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*

3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ?

3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.

3.OA.B.5: Apply properties of operations as strategies to multiply and divide.2 Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)

3.OA.D.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

3.MD.B.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.

Essential Question(s):	**Enduring Understanding(s):**
• Why do we collect, organize, represent and analyze data? • What are the different types of multiplication and division problems? • How can we show mathematical situations in word problems?	• We collect, organize, represent, and analyze data in order to answer a question or solve a problem. • The key of a picture graph tells how many items each picture or symbol represents. • A scaled graph (bar graph or line plot) is labeled using equal-sized intervals along the axes. • The scale of a bar graph varies depending on the data set. • Multiplication and division problems include repeated addition/subtraction of equal groups and array/area problems. • The order of numbers in multiplication does not change the product. • Numbers can be regrouped in a multiplication problem without changing the product. • In multiplication, one factor can be decomposed into parts; each part is multiplied separately by the other factor, then the results are added. • Identifying and describing generalizations about patterns can help us understand a variety of numerical concepts.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	28 days (20 required lessons, 6 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
3.1 Unit Launch: Family Support Video 3.1 Family Support Materials (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology**

			(beyond core resources):
equal	equal groups	equation	ST Math District - approved online resources
multiplication	expression	factors	
multiply	product	interpret	
array	rows	columns	
variable/ unknown	expression	determine	
Commutative property	Distributive property	Associative property	
fluently	pattern	Bar graph	
picture graph	key	scaled bar graph	
scaled picture graph	Multiplication Symbol	Related Facts	

Opportunities for Interdisciplinary Connections:	**Anticipated Misconceptions:**
Science • Unit 1: bar graphs and using multiplication to calculate force Social Studies • Units 1-3: Gathering data from maps	Although intervals on a bar graph are not in single units, students sometimes count each square as one. To avoid this error, have students include tick marks between each interval. Students should begin each scale with 0. They should think of skip-counting when determining the value of a bar since the scale is not in single units. Students get confused when thinking about the number of groups and the number in each group. They may have trouble identifying this information in a problem situation (which number represents the total number of groups and/or the number of items in each group). Students add the two numbers without thinking about the equal groups that the numbers represent.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Unit 1 and Unit 8	Grade 3 Unit 4 Grade 4 Unit 1
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Welcoming Interests & Identities • Optimize relevance, value and authenticity (7.2) • Nurture joy and play (7.3)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.

Perception • Support multiple ways to perceive information (1.2) **Expression & Communication** • Use multiple tools for construction, composition and creativity (5.2) **Language & Symbols** • Clarify vocabulary, symbols, and language structures (2.1)	

Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (2-3.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (2-3.4) • **analyze** and **critique** the arguments of others orally and in writing.(2-3.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (2-3.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 1 Planning Map		
Section A	I can interpret scaled graphs. ☐ Represent data using bar graphs and picture graphs. ☐ Solve one- and two-step comparison problems using addition and subtraction within 20. ☐ Generate questions about the data in scaled bar graphs or picture graphs. ☐ Represent data with scaled picture graphs or scaled bar graphs. ☐ Choose an appropriate scale for a bar graph that represents a given data set. ☐ Solve one-step comparison problems within 100, based on the data presented in scaled bar graphs or scaled picture graphs.	Cool downs Section Checkpoints Practice problems
Section B	I can represent and solve multiplication problems. I can find the unknown number in a multiplication equation. ☐ Represent a situation involving equal groups with a picture or diagram. ☐ Write multiplication expressions to represent situations and diagrams involving equal groups. ☐ Write equations for multiplication situations and diagrams using a symbol for the unknown number. ☐ Solve multiplication problems involving equal groups.	
Section C	I can represent and solve multiplication problems. I can find the unknown number in a multiplication equation.	

	☐ Build and draw arrays and describe them in terms of multiplication. ☐ Interpret arrays as equal groups in each row or column. ☐ Represent multiplication situations with arrays and multiplication expressions. ☐ Use an equation with a symbol for the unknown to represent an array. ☐ Solve multiplication problems involving arrays. ☐ Describe the commutative property of multiplication using arrays.	

Unit Title:
Unit 2: Area and Multiplication
Relevant Standards: Bold indicates priority
3.MD.C.5: Recognize area as an attribute of plane figures and understand concepts of area measurement. **3.MD.C.5.A: A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.** **3.MD.C.5.B: A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.** **3.MD.C.6: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).** **3.MD.C.7: Relate area to the operations of multiplication and addition.** **3.MD.C.7.a: Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.** **3.MD.C.7.b: Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.** **3.MD.C.7.c: Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.** **3.MD.C.7.d: Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.** **3.OA.A.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*** **3.OA.B.5: Apply properties of operations as strategies to multiply and divide.2 Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)** 3.OA.D.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends. 3.NBT.A.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

<table>
<tr><th>Essential Question(s):</th><th>Enduring Understanding(s):</th></tr>
<tr><td>

- What are we measuring when we find area?
- What are the different types of multiplication problems?
- How can we show mathematical situations in word problems?

</td><td>

- Area is an attribute of plane figures that is measured using square units.
- Area is found by covering the inside of a two-dimensional plane figure with square units without gaps or overlap and then counting the number of square units used.
- The area of a rectangle can be found by multiplying the lengths of two adjacent sides of the rectangle.
- The area of a rectangle can be found by being decomposed into two rectangular parts; finding the areas of the two smaller rectangles; and then adding the two smaller areas to find the total area.
- A figure composed of rectangles may be decomposed into rectangles whose areas may be added to find the area of the figure.
- Multiplication and division problems include repeated addition/subtraction of equal groups and array/area problems.
- The order of numbers in a multiplication problem does not change the product.
- Numbers can be regrouped in a multiplication problem without changing the product.
- In multiplication, one factor can be decomposed into parts; each part is multiplied separately by the other factor, then the results are added.
- Identifying and describing generalizations about patterns can help us understand a variety of numerical concepts.
- Place value understanding, properties of operations, and the relationships between operations can help us to perform multi-digit arithmetic.

</td></tr>
<tr><th>Demonstration of Learning:</th><th>Pacing for Unit</th></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>20 days (14 required lessons, 4 flex, 2 assessment and reaction)</td></tr>
<tr><th>Family Overview (link below)</th><th>Integration of Technology:</th></tr>
<tr><td>3.2 Unit Launch: Family Support Video
3.2 Family Support Materials (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning.</td></tr>
<tr><th>Unit-specific Vocabulary:</th><th>Aligned Unit Materials, Resources, and Technology (beyond core resources):</th></tr>
<tr><td>

area	square unit	figure

</td><td>ST Math
District - approved online resources</td></tr>
</table>

attribute	square centimeter	square foot
square inch	square meter	side lengths
interpret	tiling	Formula
decompose	Distributive property	equal groups
multiplication	expression	factors
product	interpret	Commutative property
Associative property	place value	hundreds
tens	ones	identify
property	digit	algorithm
sum	difference	addends
Pattern	Identity Property	Strategy

Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Social Studies - Unit 2 Territories and Maps	Students may not completely cover a shape with unit squares but may instead only put squares around the border of the shape. Students may not count all of the squares that cover the shape or may incorrectly count them (for example, double count a corner square). Students may think area is a linear measurement. Pose problem situations that require students to explain why area is measured in square units.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Units 3 and 8	Grade 3 Unit 7

Differentiation through *Universal Design for Learning*

UDL Indicator	**Teacher Actions:**
Sustaining Effort & Persistence ● Foster collaboration, interdependence and collective learning (8.3) **Building Knowledge** ● Connect prior knowledge to new learning (3.1) ● Maximize transfer and generalization	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.

Strategy Development • Anticipate and plan for challenges (6.2)	
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (2-3.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (2-3.4) • **analyze** and **critique** the arguments of others orally and in writing.(2-3.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (2-3.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 2 Planning Map		
Section A	I can measure the area of rectangles by counting unit squares. ☐ Build shapes with unit squares. ☐ Use unit squares to measure area. ☐ Filled with unit squares without gaps or overlaps ☐ Explain that different rectangles can have the same area. ☐ Describe and represent the area of a rectangle as the total number of unit squares arranged in rows and columns.	Cool downs Section Checkpoints Practice problems
Section B	I can find the area of a rectangle by multiplying the side lengths. ☐ Find the area of rectangles by relating area to multiplication. ☐ Use square inches and square centimeters to measure the area of a rectangle. ☐ Use square feet and square meters to measure the area of a rectangle. ☐ Find the area of rectangles by measuring and multiplying the side lengths. I can represent and solve multiplication problems. ☐ Solve real-world and mathematical problems involving area.	
Section C	I can find the area of a figure composed of rectangles. ☐ Understand that we can find the total area by adding up smaller areas. ☐ Calculate the area of figures made of rectangles using multiplication and addition. ☐ Calculate the area of figures with missing side lengths.	

Unit Title:
Unit 3: Wrapping Up 1,000
Relevant Standards: Bold indicates priority
3.OA.B.5: Apply properties of operations as strategies to multiply and divide. Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.) **3.OA.D.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.** **3.OA.D.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.** 3.NBT.A.1: Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.A.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.**

Essential Question(s):	**Enduring Understanding(s):**
• How can understanding place value help us? • How do the properties of operations make computation simpler? • How do we decide what operation to use when solving a real-world problem? • How can we show mathematical situations in word problems?	• Place value understanding, properties of operations, and the relationships between operations can help us to perform multi-digit arithmetic. • The unknown in a problem can be represented with a symbol. • Problems may have more than one step needed in order to find a solution. • Rounding can be used to assess the reasonableness of answers. • Identifying and describing generalizations about patterns can help us understand a variety of numerical concepts. • Understanding place value enables us to round numbers and perform computations. • Rounding helps solve problems mentally and assess the reasonableness of an answer. • Place value understanding, properties of operations, and the relationships between operations can help us to perform multi-digit arithmetic.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs	Unit Pacing: 27 days (20 required lessons, 5 flex, 2 assessment and reaction)

Unit Assessments

Family Overview (link below)

3.3 Unit Launch: Family Support Video
3.3 Family Support Materials (all languages)

Integration of Technology:

Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning

Unit-specific Vocabulary:

parentheses	Associative property	Commutative property
Identity property	Distributive property	round
place value	tens place	hundreds place
ones place	hundreds	tens
ones	variable/ unknown	equation
algorithm	estimate	rounding
addends	sum	pattern
digit	strategy	sum
difference		

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

ST Math
District - approved online resources

Opportunities for Interdisciplinary Connections:

Science - Unit 3
- Monarch Butterfly Population Estimation

Anticipated misconceptions:

Students may think that a symbol used to represent a number once cannot be used to represent another number in a different problem/situation. Presenting students with multiple situations in which they select the symbol and explain what it represents will counter this misconception.

The use of terms like “round up” and “round down” confuses many students. For example, the number 37 would round to 40 or they say it “rounds up”. The digit in the tens place is changed from 3 to 4 (rounds up). This misconception is what causes the problem when applied to rounding down. The number 32 should be rounded (down) to 30, but using the logic mentioned for rounding up, some
students may look at the digit in the tens place and take it to the previous number, resulting in the incorrect value of 20. To remedy this misconception, students need to use a number line to visualize the placement of the number and/or ask questions such as: “What tens

	are 32 between and which one is it closer to?" Developing the understanding of what the answer choices are before rounding can alleviate much of the misconception and confusion related to rounding. Students may not have a conceptual understanding of place value so that they would think 234 is 2+3+4 rather than 200+30+4 and may not see the relevance of the zeros. Students may not have a conceptual understanding of place value so they would think 561 – 147 = 426, because they subtract the 7 in 147 from the 1 in 561 instead of regrouping. Students may attend to "key words" in problem situations rather than focusing on the structure of the problem and making sense of the situation.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Units 5 and 7	Grade 4 Unit 4
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Building Knowledge • Connect prior knowledge to new learning (3.1) **Expression & Communication** • Build fluencies with graduated support for practice and performance (5.3) **Perception** • Support multiple ways to perceive information (1.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (2-3.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (2-3.4) • **analyze** and **critique** the arguments of others orally and in writing.(2-3.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (2-3.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources

Unit 3 Planning Map		
Section A	I can fluently add within 1,000 using a variety of strategies. ☐ Represent numbers to 1,000 in different ways using place value understanding. ☐ Relate base-ten diagrams to written algorithms for addition. ☐ Relate written algorithms to each other using place value understanding. ☐ Add within 1,000 using an algorithm or strategy.	Cool downs Section Checkpoints Practice problems
Section B	I can fluently subtract within 1,000 using a variety of strategies. ☐ Represent numbers to 1,000 in different ways using place value understanding. ☐ Relate base-ten diagrams to written algorithms for subtraction. ☐ Relate written algorithms to each other using place value understanding. ☐ Subtract within 1,000 using an algorithm or strategy.	
Section C	I can round whole numbers to the nearest multiple of 10 and 100. ☐ Identify the closest multiples of 10 and 100 for numbers within 1,000. ☐ Recognize and generalize patterns in the rounding of whole numbers within 1,000.	
Section D	I can represent and solve a variety of word problems. ☐ Estimate answers using strategies including rounding. ☐ Solve two-step word problems using addition and subtraction. ☐ Relate diagrams and equations to two-step word problems. ☐ Represent and solve two-step word problems using equations with a letter standing for the unknown quantity.	

Unit Title:
Unit 4: Relating Multiplication to Division
Relevant Standards: Bold indicates priority
3.OA.A.2: Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8. **3.OA.A.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.** **3.OA.A.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ?** **3.OA.B.5: Apply properties of operations as strategies to multiply and divide.2 Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)** **3.OA.B.6: Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.** **3.OA.C.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.** **3.OA.D.9: Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.** 3.NBT.A.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. 3.NBT.A.3: Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. 3.MD.C.7.c Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and b + c is the sum of a × b and a × c. Use area models to represent the distributive property in mathematical reasoning.

Essential Question(s):	**Enduring Understanding(s):**
• What are the different types of multiplication and division problems?	• Division situations include fair sharing (partitive) and repeated subtraction (quotative).

• How is division related to multiplication? • What are some strategies for helping learn multiplication and division facts? • How do we decide what operation to use when solving a real-world problem? • How can we show mathematical situations in word problems?	• Division is related to subtraction, so 56 ÷ 8 can be solved by subtracting 8 until you reach zero or have less than 8 left. • Division is related to multiplication. • The unknown in a problem can be represented with a symbol. • Real-world mathematical situations can be represented using drawings and equations. • Multiplication and division problems include repeated addition/subtraction of equal groups and array/area problems. • The unknown in a problem can occur in any position within the equation and must make that equation true. • The order of numbers in multiplication does not change the product. • Numbers can be regrouped in a multiplication problem without changing the product. • In multiplication, one factor can be decomposed into parts; each part is multiplied separately by the other factor, then the results are added. • Understand that the inverse, or opposite of division is multiplication, therefore the answer to 24 ÷ 8 can be found by solving 8 × = 24. • There is an inverse relationship between multiplication and division that can help us learn our multiplication and division facts. (I.e Knowing that 8 x 3 = 24 helps us know the answer to 24 ÷ 8 is 3). • Place value understanding, properties of operations, and the relationships between operations can help us to perform multi-digit arithmetic. • Place value understanding and properties of operations can help us to multiply a one-digit number by multiples of 10. • The area of a rectangle can be found by being decomposed into two rectangular parts; finding the areas of the two smaller rectangles; and then adding the two smaller areas to find the total area.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	34 days (21 required lessons, 11 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
3.4 Unit Launch: Family Support Video 3.4 Family Support Materials (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology**

			(beyond core resources):
equation	divide	division sentence	ST Math District - approved online resources
quotient	equal	determine	
array	rows	columns	
factors	product	variable/ unknown	
solve	multiplication	multiplication expression	
multiplication symbol	Commutative property	place value	
hundreds	tens	ones	
Identity property	digit	algorithm	
strategy	sum	difference	
expression	Tiling	describe	
represent	Associative property	Distributive property	
apply	relate	dividend	
divisor	quotient	relationship	
inverse	Addends	related facts	
fluently	multiply	multiple	
place value	area	side lengths	
Square unit	formula	decompose	

Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
ELA Unit 3 - Exploring Different Point of Views and Strategies to Solve	Students may not know if the problem represents a subtraction situation or division situation. They also may not reason correctly about the type of division in a given situation. Some division situations give the number of groups and some give the number in each group. The student sees multiplication and division as discrete and separate operations. Ex: Student has reasonable facility with multiplication facts but cannot master

	division facts. He may know that 6 × 7 = 42 but fails to realize that this fact also tells him that 42 ÷ 7 = 6. Students may think that 3 ÷ 15 = 5 and 15 ÷ 3 = 5 are the same equations. The use of models is essential in helping students eliminate this misunderstanding. Students may not know that 5 x 20 is the same amount as 20 x 5. Students may have difficulty seeing that each arrangement can be rotated to show the commutative property. Students think a symbol (? or) is always the place for the answer. This is especially true when the problem is written as 15 ÷ 3 =? or 15 = x 3. Students also think that 3 ÷ 15 = 5 and 15 ÷ 3 = 5 are the same equations. The use of models is essential in helping students eliminate this understanding. Students may not attend to place value when multiplying large numbers. Avoid teaching tricks such as "adding zeros."For true understanding students need to understand and be able to explain the place value reasoning. Stating that you are "adding zeros" teaches many misconceptions. When multiplying 5 x 40, students multiply 5 groups of 4 and get the answer of 20. This may lead to confusion because the product of the single digit number already ends in zero and they fail to notice that it represents 20 tens. Be sure to go back to the place value language. 5 groups of 4 is 20 therefore, 5 groups of 4 tens would be 20 tens. 20 tens is the same as 200.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Unit 8 Grade 3 Unit 1	Grade 4 Unit 6
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Welcoming Interests & Identities • Nurture joy and play (7.3) **Expression & Communication** • Build fluencies with graduated support for practice and performance (5.3) • Address biases related to modes of expression and communication (5.4) **Perception** • Support multiple ways to perceive information (1.2) **Language & Symbols** • Clarify vocabulary, symbols, and language structures (2.1)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.

Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (2-3.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (2-3.4) • **analyze** and **critique** the arguments of others orally and in writing.(2-3.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (2-3.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 4 Planning Map		
Section A	I can represent and solve division problems. ☐ Interpret and relate drawings and descriptions of division situations. ☐ Understand that a division situation may involve finding an unknown number of groups or objects in each group. ☐ Solve "how many groups?" and "how many in each group?" problems. ☐ Interpret division expressions. ☐ Write division expressions to represent division situations.	Cool downs Section Checkpoints Practice problems
Section B	I can represent and solve multiplication and division problems using properties of operations. ☐ Explain the relationship between multiplication and division equations. ☐ Interpret division equations as multiplication equations with a missing factor. ☐ Represent situations using multiplication and division equations with a symbol for the unknown quantity. ☐ Recognize that I can multiply factors in any order. ☐ Use area diagrams to show the Associative and Distributive properties of multiplication. I can use patterns in multiplication to solve unknown facts. ☐ Identify patterns in the multiplication table and use them to find unknown multiplication facts. ☐ Explain patterns in the multiplication table.	
Section C	I can represent and solve multiplication problems using properties of operations. ☐ Multiply one-digit whole numbers by multiples of 10 using place value strategies. ☐ Multiply within 100, where one factor is a teen number.	

	☐ Multiply within 100, where one factor is greater than 20. I can represent and solve a variety of word problems. ☐ Represent two-step word problems using equations with a letter standing for the unknown quantity. ☐ Solve two-step word problems using the four operations.	
Section D	I can represent and solve division problems using properties of operations. ☐ Solve “how many groups?” and “how many in each group?” problems with larger numbers. ☐ Use base-ten blocks to represent division where the quotient is more than 10. ☐ Divide within 100 using place value strategies. I can represent and solve a variety of word problems. ☐ Represent two-step word problems using equations with a letter standing for the unknown quantity. ☐ Solve two-step word problems using the four operations.	

Unit Title:
Unit 5: Fractions as Numbers
Relevant Standards: Bold indicates priority
3.NF.A.1: Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a part of size 1/b. **3.NF.A.2: Understand a fraction as a number on the number line; represent fractions on a number line diagram.** **3.NF.A.2.A: Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.** **3.NF.A.2.B: Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.** **3.NF.A.3: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size** **3.NF.A.3.A: Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.** **3.NF.A.3.B: Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3. Explain why the fractions are equivalent, e.g., by using a visual fraction model.** **3.NF.A.3.C: Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.** **3.NF.A.3.D: Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.** 3.MD.B.4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters. 3.G.A.2: Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

Essential Question(s):	**Enduring Understanding(s):**
• How are the numerator and denominator related in a fraction? • How does the size of equal parts relate to the	• A fraction is a number showing a relationship between the parts and the whole. • Fractional parts have names that tell how many

number of equal parts of a whole? • When is one-half not equal to one-half? • What are equivalent fractions? • What do you have to think about when comparing fractions? • How does partitioning help us reason about shapes?	parts of a size are needed to make the whole (3 parts – thirds; 4 parts – fourths, etc.). • Fractional parts can be described with words and symbols. • Fractions can be represented with visual models such as rectangular area models, arrays, and length models including number lines. • The numerator tells the count of the number of equal parts and the denominator tells the number of equal parts in the whole. • As the number of equal parts of the whole increases, the size of the equal parts decreases and vice versa. • The size of the fractional part is relative to the whole. One-half is not equal to one-half when the whole is a different size (e.g. ½ of a small pizza vs. ½ of a large pizza). • On a number line, the size of the part is measured by the distance from zero to the numbered point. • A unit fraction represents one piece of the equal-sized pieces that make a whole (1/2 , 1/3 , 1/4 , 1/6 , 1/8). • A unit fraction is the building block for fractions just as 1 is the building block for whole numbers. • Equivalent fractions use different sized fractional parts to describe the same amount, e.g., 1/2 = 2/4 . • Two fractions are equivalent (equal) if they are the same size or the same point on a number line. • Two fractions can be compared when the two fractions refer to the same whole. • Comparing two fractions requires thinking about the size of the parts (denominator) and the number of the parts (numerator). • Length measurement data can be generated and used to create a line plot. • The scale of a line plot can be whole numbers or fractions such as halves, or fourths (quarters). • Partitioning a shape into equal parts in more than one way can help us see that equal parts can look different, but have the same area. • When shapes are partitioned into equal areas, the area of each part is the unit fraction of the whole.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	29 days (17 required lessons, 10 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
3.5 Unit Launch: Family Support Video	*Intentionally aligned use of digital tools and resources*

3.5 Family Support Materials (all languages)	*to support acquisition of content, researching, organizing and communicating learning*

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

numerator	denominator	fraction
unit fraction	whole	part
partition	unit fraction	number line
interval	partition	distance
units		plot
equivalent	equivalent fraction	whole
whole number	equal	compare
greater than >	less than <	Equal to =
line plot	halves	fourths
quarters	data	area

ST Math
District - approved online resources

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

Science - Unit 3
- Climate Zones on Maps - Relate the Zone to the Whole World (Fraction to Whole)

Students may not understand that fractional parts are equal parts. In order to be thirds, for example, there can't just be 3 pieces, there have to be 3 equal pieces. Students may be confused by the idea that the denominator (the bottom number) represents how many equal pieces are in the whole or set and the numerator (the top number) represents how many of those equal pieces you have.

Students may draw lines on a shape to partition it into parts, but those parts may not be equal. Just because a shape has been partitioned into 3 parts it does not mean that those parts represent thirds.

Students may not realize that shapes partitioned into equal parts can look different, but have the same area.

Students only think of fractions as a rectangle or circle partitioned into equal parts rather than as numbers at distinct points on the number line. Students may not understand that you count fractions just like you count whole numbers and that the size of the piece doesn't change as you count them. Therefore, when we could fourths we count 1/4, 2/4, 3/4, 4/4 and so on. The unit

	fraction represents the size of the pieces you are counting. Students try to apply whole number understanding when comparing fractions, for example they think that eighths are larger than fourths because 8 is more than 4. Similarly, students may think that 4/8 is more than 2/4 because 8 is bigger than 4 and 4 is bigger than 2.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Units 4, 5, and 6	Grade 4 Units 2, 3 and 4
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Building Knowledge • Highlight and explore patterns, critical features, big ideas and relationships (3.2) • Cultivate multiple ways of knowing and making meaning (3.3) • Maximize transfer and generalization (3.4) **Expression & Communication** • Use multiple tools for construction, composition and creativity (5.2) **Language & Symbols** • Clarify vocabulary, symbols, and language structures (2.1)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (2-3.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (2-3.4) • **analyze** and **critique** the arguments of others orally and in writing.(2-3.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (2-3.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 5 Planning Map		
Section A	I can represent fractions using a variety of models and explain my reasoning. ☐ Name parts of a whole. ☐ Use fractions to describe parts.	

	☐ Understand that a unit fraction describes one of the equal-size parts. ☐ Build non-unit fractions and whole numbers from unit fractions.	Cool downs Section Checkpoints Practice problems
Section B	I can partition and label a number line with even intervals representing fractions. ☐ Equally partition a number line for a given denominator. ☐ Locate fractions on the number line, including fractions greater than 1. ☐ Locate whole numbers on the number line given the location of a fraction. ☐ Write and represent whole numbers as fractions.	
Section C	I can generate and explain equivalent fractions using a variety of models. ☐ Identify equivalent fractions using models or diagrams. ☐ Use diagrams or number lines to show that two fractions are equivalent. ☐ Understand that equivalent fractions refer to the same whole. ☐ Write and represent fractions that are equivalent to whole numbers.	
Section D	I can compare two fractions with the same numerator or denominator and justify my reasoning. ☐ Use diagrams, number lines, or the meaning of the numerator and denominator to compare two fractions. ☐ Use the symbols >, =, or < to compare two fractions.	

Unit Title:
Unit 6: Measuring Length, Time, Liquid Volume and Weight
Relevant Standards: Bold indicates priority
3.OA.A.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. **3.OA.C.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.** 3.NBT.A.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. **3.NF.A.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a part of size 1/b.**

3.NF.A.3.c: Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.

3.MD.A.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

3.MD.A.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

3.MD.B.4: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.

Essential Question(s):	**Enduring Understanding(s):**
• Why is it useful to know about time? • Why is measurement useful? • What are we measuring when we find liquid volume or mass? • How do we estimate the measurement of an object? • Why do we collect, organize, represent and analyze data?	• Division situations include fair sharing (partitive) and repeated subtraction (quotative). • The unknown in a problem can be represented with a symbol. • Real-world mathematical situations can be represented using drawings and equations. • There is an inverse relationship between multiplication and division that can help us learn our multiplication and division facts. (I.e Knowing that 8 x 3 = 24 helps us know the answer to 24 ÷ 8 is 3). • Place value understanding, properties of operations, and the relationships between operations can help us to perform multi-digit arithmetic. • A fraction is a number showing a relationship between the parts and the whole. • Fractional parts have names that tell how many parts of a size are needed to make the whole (3 parts – thirds; 4 parts – fourths, etc.). • Fractional parts can be described with words and symbols • Fractions can be represented with visual models such as rectangular area models, arrays, and length models including number lines. • The numerator tells the count of the number of equal parts and the denominator tells the number of equal parts in the whole. • As the number of equal parts of the whole increases, the size of the equal parts decreases and vice versa. • The size of the fractional part is relative to the whole. One-half is not equal to one-half when the wholes are different sizes (e.g. ½ of a small

<table>
<tr><td></td><td>pizza vs. ½ of a large pizza).
• Equivalent fractions use different sized fractional parts to describe the same amount, e.g., 1/2 = 2/4 .
• Two fractions are equivalent (equal) if they are the same size or the same point on a number line.
• Time is measured in hours and minutes.
• Time can be measured to the nearest minute.
• Elapsed time measures the duration of an event.
• Being able to tell time and find elapsed time is useful for making plans and schedules and determining how long an event lasts.
• Measurement allows us to tell how many standard units of an attribute an item has and solve problems with the quantities.
• Liquid volume and mass tell us how much matter in a three-dimensional space.
• We estimate the measurement of an object by comparing the object to personal referents or easy-to-use “benchmark” units.
• Mass and liquid volume word problems are solved using whole number strategies.
• Length measurement data can be generated and used to create a line plot.
• The scale of a line plot can be whole numbers or fractions such as halves, or fourths (quarters).</td></tr>
<tr><td>Demonstration of Learning:</td><td>Pacing for Unit</td></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>Sections 6A & 6C: 10 days (8 required lessons + 2 flex)
Section 6B & 6D: 7 days (7 required lessons)</td></tr>
<tr><td>Family Overview (link below)</td><td>Integration of Technology:</td></tr>
<tr><td>3.6 Unit Launch: Family Support Video
3.6 Family Support Materials (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><td>Unit-specific Vocabulary:</td><td>Aligned Unit Materials, Resources, and Technology (beyond core resources):</td></tr>
<tr><td><table>
<tr><td>array</td><td>rows</td><td>columns</td></tr>
<tr><td>factors</td><td>product</td><td>variable</td></tr>
<tr><td>solve</td><td>multiplication</td><td>multiplication expression</td></tr>
<tr><td>multiplication symbol</td><td>Commutative property</td><td>numerator</td></tr>
</table></td><td>ST Math
District - approved online resources</td></tr>
</table>

denominator	fraction	equivalent fraction
whole number	equal	number line
related facts	Distributive property	Associative property
fluently	place value	hundreds
tens	ones	Identity property
digit	unit fraction	whole
part	partition	analog clock
digital clock	time interval	start time
end time	elapsed time	number line diagram
hours	minutes	hour hand
minute hand	a.m.	p.m.
capacity	liquid volume	liter (L)
milliliter (mL)	grams (g)	kilograms (kg)
mass	estimate	weight
line plot	halves	fourths
quarters	data	units
intervals	plot	

Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
Science - Unit 1 - Ramp Experiment (measuring distance)	Students need to understand that there are 60 minutes in an hour and that all 60 minutes are represented on a clock, not just the multiples of 5. Students may confuse adding and subtracting in base ten with elapsed time, forgetting that there are 60 minutes in one hour, not 100 minutes. When using measurement tools, students may read the mark on a scale that is below a designated number on the scale as if it was the next number. For example, a mark that is one mark below 80 grams may be read as 81 grams. Students realize it is one away from 80, but do not think of it as 79 grams.

	A line plot has data points marked above a number line. Students may incorrectly choose a line plot to display data such as favorite foods or class pets, rather than numerical data. They also may not include numbers in the scale if there is no data for that number. Students must try to keep the "x" marks on a line plot consistently sized and evenly spaced.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Units 3 and 6	Grade 4 Unit 5
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
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) **Language & Symbols** • Illustrate through multiple media (2.5) **Interaction** • Optimize access to accessible materials and assistive and accessible technologies and tools (4.2) **Strategy Development** • Anticipate and plan for challenges (6.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (2-3.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (2-3.4) • **analyze** and **critique** the arguments of others orally and in writing.(2-3.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (2-3.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 6 Planning Map		
Section A	I can measure to the nearest half inch and quarter inch. ☐ Measure lengths using a ruler marked with halves or fourths of an inch. ☐ Use equivalent fractions to describe length measurements.	

	I can create line plots to display fractional measurement data and use the information to solve problems. ☐ Analyze line plots that display measurement data in fractions of an inch. ☐ Use the information from a line plot to answer questions. ☐ Create a line plot which includes ☐ a scale marked off in appropriate units to represent the measurement data ☐ labels ☐ a title ☐ X's at the correct spot to show the data	Cool downs Section Checkpoints Practice problems
Section B	I can measure and estimate liquid volumes and weights of objects. ☐ Measure and estimate weights of objects using grams (g) and kilograms (kg). ☐ Understand liquid volume as the amount of space that a liquid takes up. ☐ Measure and estimate liquid volumes of objects using liters (L).	
Section C	I can tell time to the minute. ☐ Read time to the minute on an analog clock. ☐ Write the time shown on an analog clock.	
	I can solve real world problems involving time. ☐ Solve problems involving addition and subtraction of time intervals in minutes. ☐ Find the unknown start time, unknown duration, or unknown end time to solve a problem.	
Section D	I can solve real-world measurement problems using addition, subtraction, multiplication or division. ☐ Interpret representations of situations involving measurements. ☐ Determine information that is needed to solve measurement problems. ☐ Solve one-step word problems involving measurement.	

Unit Title:
Unit 7: Two-dimensional Shapes and Perimeter
Relevant Standards: Bold indicates priority
3.OA.C.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. **3.OA.D.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.**

3.NBT.A.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.MD.C.7.b: Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

3.MD.D.8 Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

3.G.A.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

Essential Question(s):	**Enduring Understanding(s):**
• How can polygons be described and classified? • What are we measuring when we find perimeter?	• There is an inverse relationship between multiplication and division that can help us learn our multiplication and division facts. (I.e Knowing that 8 x 3 = 24 helps us know the answer to 24 ÷ 8 is 3). • The unknown in a problem can be represented with a symbol. • Problems may have more than one step needed in order to find a solution. • Rounding can be used to assess the reasonableness of answers. • Place value understanding, properties of operations, and the relationships between operations can help us to perform multi-digit arithmetic. • The area of a rectangle can be found by multiplying the lengths of two adjacent sides of the rectangle. • Perimeter is found by adding all the outside (exterior) side lengths of a polygon. • An unknown side length of a polygon can be found when given the perimeter and other side lengths or properties of the polygon. • Different rectangles may have the same perimeter but different areas. Different rectangles may have the same area but different perimeters. • Polygons are closed two-dimensional shapes with straight sides. • Polygons can be compared, sorted and classified using attributes, e.g. number of sides.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs	Sections 7C, B, & A: 21 days (12 required lessons, 7 flex and 2 assessment/reflection)

<table>
<tr><td>Unit Assessments</td><td>Section 7D: 3 days (3 required lessons)</td></tr>
<tr><td>Family Overview (link below)</td><td>Integration of Technology:</td></tr>
<tr><td>3.7 Unit Launch: Family Support Video
3.7 Family Support Materials (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><td>Unit-specific Vocabulary:</td><td>Aligned Unit Materials, Resources, and Technology (beyond core resources):</td></tr>
<tr><td>
<table>
<tr><td>product</td><td>factors</td><td>multiplication</td></tr>
<tr><td>related facts</td><td>Commutative property</td><td>Distributive property</td></tr>
<tr><td>Associative property</td><td>fluently</td><td>variable/ unknown</td></tr>
<tr><td>equation</td><td>algorithm</td><td>estimate</td></tr>
<tr><td>rounding</td><td>perimeter</td><td>length</td></tr>
<tr><td>width</td><td>polygon</td><td>side</td></tr>
<tr><td>unit</td><td>inch</td><td>centimeters</td></tr>
<tr><td>feet</td><td>meter</td><td>yard</td></tr>
<tr><td>rhombus</td><td>trapezoid</td><td>rectangle</td></tr>
<tr><td>square</td><td>place value</td><td>hundreds</td></tr>
<tr><td>tens</td><td>ones</td><td>Identity property</td></tr>
<tr><td>digit</td><td>strategy</td><td>sum</td></tr>
<tr><td>difference</td><td>addends</td><td>area</td></tr>
<tr><td>side lengths</td><td>square unit</td><td>square foot</td></tr>
<tr><td>square inch</td><td>square centimeter</td><td>square meter</td></tr>
<tr><td>square yard</td><td>formula</td><td>tiling</td></tr>
<tr><td>attribute</td><td>hexagon</td><td>octagon</td></tr>
<tr><td>pentagon</td><td>polygon</td><td>quadrilateral</td></tr>
<tr><td>triangle</td><td>categorize</td><td>right angle</td></tr>
</table>
</td><td>ST Math
District - approved online resources</td></tr>
</table>

Opportunities for Interdisciplinary Connections:	**Anticipated misconceptions:**
ELA - Unit 3 - Relate Characteristics to Different Attributes of a Shape	Students think that when they are presented with a problem where only two of the side lengths are shown, they add only those numbers to find the perimeter. They may also multiply these two dimensions, finding the area instead of the perimeter. Students do not recognize that perimeter is linear and is measured in units and that area is a measure of space and is measured in square units. Students may not see that shapes can belong to more than one category because of their attributes. For example, students may identify a square as a "non-rectangle" or a "non-rhombus". They do not recognize that a square is a rectangle because it has all of the properties of a rectangle and a rhombus because it has all of the properties of a rhombus.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Units 3 and 6	Grade 4 Units 7 and 8
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Building Knowledge • Connect prior knowledge to new learning (3.1) • Highlight and explore patterns, critical features, big ideas, and relationships (3.2) **Language & Symbols** • Clarify vocabulary, symbols, and language structures (2.1) **Welcoming Interests & Identities** • Nurture joy and play (7.3)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (2-3.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (2-3.4) • **analyze** and **critique** the arguments of others orally and in writing.(2-3.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (2-3.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 7 Planning Map		
Section A	I can describe, compare, and sort shapes based on their properties. ☐ Describe attributes of shapes and sort shapes based on their attributes. ☐ Describe and identify rhombuses, rectangles, and squares using their attributes. ☐ Draw examples of quadrilaterals that are not rhombuses, rectangles, or squares. ☐ Explain how shapes can be in more than one category.	Cool downs Section Checkpoints Practice problems
Section B	I can find the perimeter of polygons. ☐ Describe perimeter as the length around a flat shape. ☐ Find the perimeter of two-dimensional shapes given all or some of the side lengths. ☐ Find unknown side lengths given the perimeter of a shape. ☐ Solve problems that involve perimeters of shapes.	
Sections C & D	I can solve problems involving perimeter and area. ☐ Draw or label shapes accurately to help visualize perimeter and area problems. ☐ Use understanding of the difference between perimeter and area of rectangles to solve story problems. ☐ Draw rectangles with the same perimeter and different areas. ☐ Draw rectangles with the same area and different perimeters.	

Course Title:	Content Area:	Grade Level:	Credit (if applicable)
Grade 4 Mathematics	Math	4	

Course Description:

The big ideas in grade 4 include: developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Aligned Core Resources:	Connection to the *BPS Vision of the Graduate*
Illustrative Math 360	**Content Mastery** • Develop and draw from a baseline understanding of knowledge in academic disciplines from our Bristol curriculum **Collaboration** • Demonstrates ability to work effectively and respectfully with diverse teams. • Assume shared responsibility for collaborative work and value the individual contributions made by each team member **Communication** • Articulates thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts • Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions. Use communication for a range of purposes **Critical Thinking and Problem Solving** • Collect, assess and analyze relevant information • Reason effectively. Identify, define and solve authentic problems and essential questions. • Reflect critically on learning experience, processes and solutions • Transfer knowledge to other situations.

Additional Course Information: *Knowledge/Skill Dependent courses/prerequisites*	Link to *Completed Equity Audit*
N/A	Grade 4 Math Completed Equity Audit

Standard Matrix

M-Major Cluster, S-Supporting Cluster, A-Additional Cluster

District Learning Expectations and Standards	U1	U2	U3	U4	U5	U6	U7	U8	U9
Operations and Algebraic Thinking									
Use the four operations with whole numbers to solve problems.									
4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.					M				

4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.					M				
4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	M				M	M			M
Gain familiarity with factors and multiples.									
4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.	S								
Generate and analyze patterns.									
4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.						A			
Number and Operations in Base Ten									
Generalize place value understanding for multi-digit whole numbers.									
4.NBT.A.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.				M					
4.NBT.A.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.				M					

4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.				M					
Use place value understanding and properties of operations to perform multi-digit arithmetic.									
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm**.**				M		M			M
4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.						M			M
4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.						M			M
Number and Operations - Fractions									
Extend understanding of fraction equivalence and ordering.									
4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.		M	M						M
4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.		M							M
Build fractions from unit fractions.									
4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.			M		M				M
4.NF.B.3.A Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.			M						
4.NF.B.3.B Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each			M						

decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.									
4.NF.B.3.C Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.			M						
4.NF.B.3.D Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.			M						
4.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.			M						M
4.NF.B.4.A Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).			M						
4.NF.B.4.B Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)			M						
4.NF.B.4.C Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?			M						
Understand decimal notation for fractions and compare decimal fractions.									
4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.2 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.			M	M					
4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.				M					

4.NF.C.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.				M					
Measurement and Data									
Solve problems involving measurement and conversion of measurements.									
4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...					S				
4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.					S	S		S	
4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.					S	S		S	
Represent and interpret data.									
4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.			S						
Geometric measurement: understand concepts of angle and measure angles.									
4.MD.C.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:							A		

4.MD.C.5.A An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.							A		
4.MD.C.5.B An angle that turns through n one-degree angles is said to have an angle measure of n degrees.							A		
4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.							A		
4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.							A	A	
Geometry									
Draw and identify lines and angles, and classify shapes by properties of their lines and angles.									
4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.							A	A	
4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.								A	
4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.								A	

Unit Links

Unit 1: Factors and Multiples
Unit 2: Fraction Equivalence and Comparison
Unit 3: Extending Operations to Fractions
Unit 4: From Hundredths to Hundred Thousands
Unit 5: Multiplicative Comparison and Measurement

Unit 6: Multiplying and Dividing Multi-Digit Numbers
Unit 7: Angles and Angle Measurement
Unit 8: Properties of Two-Dimensional Shapes

Unit Title:

Unit 1: Factors and Multiples

Relevant Standards: Bold indicates priority

4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors.

Essential Question(s):	**Enduring Understanding(s):**
• How can we show mathematical situations in word problems? • How do we decide what operation to use when solving a real-world problem? • Why do we decompose whole numbers into factor pairs?	• We can show mathematical situations in word problems using numbers, symbols, and operations signs, or by making tables or drawings. • Recognizing how a real-world situation fits into a common operation category helps to solve the problem. • Estimation strategies, including rounding, can be used to determine the reasonableness of answers. • An unknown can be in any position of a multiplicative comparison problem.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	Unit Pacing: 13 days (6 required lessons, 5 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
Family Support Video Unit 1 Family Support Materials Unit 1 (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
operations, equations, estimation unknown, multi-step, reasonableness	ST Math District - approved online resources

quantity		
factor	product	multiples
odd	even	prime
composite		

Opportunities for Interdisciplinary Connections:	**Anticipated conceptions:**
Connections to Grade 4 Science NGSS Connection: 4-ESS2-1 (Earth's Systems) • Using factors to analyze patterns in rock formations • Finding multiples in natural cycles and weather patterns • Applying number patterns to understand geological time scales	Students believe a multi-step problem is completed/solved after completing a single step. When listing multiples of numbers, students may not list the number itself. Emphasize that the smallest multiple is the number itself. Some students may think that larger numbers have more factors. Having students share all factor pairs and how they found them will clear up this idea.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3 Unit 1	Grade 4 Unit 6
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation - Building Knowledge • Connect prior knowledge to new learning (3.1) • Highlight and explore patterns, critical features, big ideas and relationships. (3.2) **Representation - Language and Symbols** • Clarify vocabulary**,** symbols and language structures (2.1) **Engagement - Sustaining Effort and Persistence** • Foster belonging and community (8.1)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Goals:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others orally and in writing. (4-5.6)	See Illustrative Math Teachers Guide for identified lesson "Goals"

• **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 1 Planning Map		
Section A	I can find all factor pairs for a whole number between 1 and 100. ☐ Find side lengths of different rectangles with a given area. ☐ Understand that each side length of a rectangle is a factor of its area. ☐ Explain why a number between 1-100 is prime or composite. I can determine if a whole number between 1 and 100 is a multiple of a particular one digit number. ☐ Find areas of different rectangles with a given side length. ☐ Understand that the area of a rectangle is a multiple of each of its side lengths.	Cool downs Section Checkpoints Practice problems
Section B	I can solve real-world problems involving all four operations. ☐ Apply understanding of factors, multiples, and prime and composite numbers to solve problems.	

Unit Title:

Unit 2: Fraction Equivalence and Comparison

Relevant Standards: Bold indicates priority

4.NF.A.1: Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
4.NF.A.2: Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Essential Question(s):	**Enduring Understanding(s):**
• What are equivalent fractions? • When can we compare fractions? • What are some strategies we can use to compare fractions?	• Equivalent fractions use different sized fractional parts to describe the same amount, e.g., 1/2 = 2/4 . • Two fractions are equivalent (equal) if they are the same size or the same point on a number line. • Multiplying the numerator and the denominator by the same number will result in an equivalent fraction. • There is a multiplicative relationship between the number of equal parts in a whole and the size of the parts. • Two fractions can be compared when the two fractions refer to the same whole. • Comparing two fractions requires thinking about the size of the parts (denominator) and the number of the parts (numerator).
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	Unit Pacing: 23 days (16 required lessons, 5 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
Family Support Video Unit 2 Family Support Materials Unit 2 (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
fractions, unit fractions, equivalent fraction model, numerator, denominator	ST Math District - approved online resources

fraction bars	whole	part
partition	distance	interval
number line	greater than >	less than <
equal to =	comparison	

Opportunities for Interdisciplinary Connections:	**Anticipated conceptions:**
Grade 4 Science: Unit 3: • Comparing energy levels using fraction models • Understanding partial energy transfers • Representing energy conservation using equivalent fractions	When representing fractions on a number line: -Students may think that the right side of the number line only represents 1 whole. -Students might count tick marks instead of equal spaces between numbers. -Students may not partition number lines equally creating incorrect representations. Students think that when generating equivalent fractions they only need to multiply or divide either the numerator or denominator. For example, when determining an equivalent amount of sixths for 1/2 students might multiply the denominator by 3 to • get 1/6 , instead of multiplying ½ by 3/3. Students try to apply whole number understanding when comparing fractions. For example, they think that eighths are larger than fourths because 8 is more than 4. Similarly, students may think that 4/8 is more than 2/4 because 8 is bigger than 4 and 4 is bigger than 2.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3, Unit 5	Grade 5 Unit 6

Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement - Welcoming Interests and Identities • Optimize choice and autonomy (7.1) **Representation - Perception** • Support multiple ways to perceive information (1.2) **Representation - Building Knowledge** • Connect prior knowledge to new learning (3.1) • Highlight and explore patterns, critical features, big ideas and relationships (3.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.

Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
An EL can…	See Illustrative Math Teachers Guide for identified

• **participate** in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others orally and in writing. (4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 2 Planning Map		
Section A	I can represent fractions using a variety of models and explain my reasoning. ☐ Use diagrams to represent fractions. ☐ Compare fractions with the same numerator or the same denominator using physical or visual representations. ☐ Identify equivalent fractions using a visual representation or on a number line. ☐ Locate fractions on the number line and compare their size to ½ and to 1.	Cool downs Section Checkpoints Practice problems
Section B	I can generate equivalent fractions and justify my reasoning. ☐ Generate equivalent fractions using a model or number line. ☐ Given a pair of equivalent fractions, explain why they are equivalent. ☐ Generate equivalent fractions numerically, by using multiples or factors of the numerator and denominator.	
Section C	I can compare two fractions and justify my reasoning. ☐ Compare fractions using diagrams, number lines, or the meaning of the numerator and denominator. ☐ Compare two fractions using equivalent fractions with a common denominator. ☐ Solve fraction comparison problems in and out of context.	

Unit Title:
Unit 3: Extending Operations to Fractions
Relevant Standards: Bold indicates priority
4.NF.A.1: Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. **4.NF.A.2: Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that**

comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
4.NF.B.3 : Understand a fraction a/b with a > 1 as a sum of fractions 1/b.
4.NF.B.3.a: Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.B.3.b: Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.
4.NF.B.3.c: Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
4.NF.B.3.d: Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
4.NF.B.4: Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
4.NF.B.4.a: Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).
4.NF.B.4.b: Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)
4.NF.B.4.c: Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?
4.NF.C.5: Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.
4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Essential Question(s):	**Enduring Understanding(s):**
• What does it mean to multiply a fraction by a whole number? • What strategies can help us multiply a whole number by a fraction? • When can we add or subtract fractions and decimals? • What strategies can help us add and subtract fractions? • Why do we decompose fractions? • Why do we collect, organize, represent and analyze data?	• Multiplying a fraction by a whole number means adding that fraction to itself multiple times. • The idea of the numerator as a multiplier can be used when a fraction is being multiplied by a whole number, e.g., Just as 5/8 = 5× 1/8 , 5 groups of 3/8 equals 5 × 3/8 = (5×3)× 1/8 which equals 15/8 . • Arrays, number lines, fraction strips, or sets can be used to find the solution to multiplying a whole number by a fraction. • Fractions can be added and subtracted when the wholes are the same size. • Mixed numbers can be written as fractions, e.g., 14/3 = 4 2/3 , and can be added or subtracted in this form. • Fractions with the same denominators can be added and subtracted using visual models, properties of operations, and relationships of addition and subtraction of whole numbers. • We decompose fractions into sums or products of fractions to make computation easier or to simplify expressions. • Any fraction with a denominator of 10 can be

<table>
<tr><td></td><td>renamed as a fraction with a denominator of 100 using equivalent fractions.
• Data can be organized and represented in a picture graph, a bar graph, or a line plot.
• Information presented in a graph can be used to solve problems involving the data in the graph.</td></tr>
<tr><td>Demonstration of Learning:</td><td>Pacing for Unit</td></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>Unit Pacing: 25 days (18 required lessons, 5 flex, 2 assessment and reaction)</td></tr>
<tr><td>Family Overview (link below)</td><td>Integration of Technology:</td></tr>
<tr><td>Family Support Video Unit 3
Family Support Materials Unit 3 (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><td>Unit-specific Vocabulary:</td><td>Aligned Unit Materials, Resources, and Technology (beyond core resources):</td></tr>
<tr><td>
<table>
<tr><td>fraction</td><td>unit fraction</td><td>equivalent</td></tr>
<tr><td>fraction model</td><td>numerator</td><td>denominator</td></tr>
<tr><td>fraction bars</td><td>whole</td><td>part</td></tr>
<tr><td>partition</td><td>distance</td><td>interval</td></tr>
<tr><td>number line</td><td>equal</td><td>decompose</td></tr>
<tr><td>ordering</td><td>mixed number</td><td>multiple</td></tr>
<tr><td>whole number</td><td>multiple</td><td>equivalent fraction</td></tr>
<tr><td>line plot</td><td>interpret</td><td>data</td></tr>
<tr><td>numerator</td><td>denominator</td><td></td></tr>
</table>
</td><td>ST Math
District - approved online resources</td></tr>
<tr><td>Opportunities for Interdisciplinary Connections:</td><td>Anticipated conceptions:</td></tr>
<tr><td>Grade 4 Science: Unit 1:
• Apply fraction concepts when analyzing data from weather patterns

Grade 4 Science: Unit 3:
• Converting between energy units using fraction operations
• Calculating partial energy transfers in systems
• Solving problems involving fractional</td><td>Students think that it does not matter which model to use when finding the sum or difference of fractions. They may represent one fraction with a rectangle and the other fraction with a circle. They need to know that the models need to represent the same whole.

Students may mistakenly choose to display non-numerical data in a line plot, for example “Favorite Pizza Toppings”. When making a line plot, students might not remember to include every number within the</td></tr>
</table>

measurements in experiments	range of data.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3, Unit 1 Grade 3, Unit 5	Grade 5, Unit 2 Grade 5, Unit 3 Grade 5, Unit 5 Grade 5, Unit 6
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement - Welcoming Interests and Identities • Optimize choice and autonomy (tools used for exploration and production) (7.1) **Representation - Perception** • Support multiple ways to perceive information (1.2) **Representation - Building Knowledge** • Connect prior knowledge to new learning (3.1) • Highlight and explore patterns, critical features, big ideas and relationships (3.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others orally and in writing. (4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 3 Planning Map		
Section A	I can represent and solve fraction multiplication problems involving a fraction and a whole number. ☐ Interpret and relate descriptions, drawings, and expressions that represent situations involving equal groups of fractions. ☐ Interpret diagrams and expressions that represent multiplication of a whole number and a unit fraction. ☐ Use diagrams and expressions to represent and find the product of a whole number and a unit fraction. ☐ Evaluate multiplication expressions and recognize that	

	$n \times \frac{1}{b} = \frac{n}{b}$. ☐ Recognize that $n \times \frac{a}{b} = \frac{n \times a}{b}$ ☐ Use diagrams to represent and evaluate the product of a whole number and a non-unit fraction. ☐ Write equivalent expressions for the multiplication of a fraction by a whole number and explain or show that the expressions are equivalent. ☐ Represent and solve problems involving multiplication of a fraction by a whole number. I can decompose a fraction in more than one way. ☐ Recognize that a fraction can be decomposed into a sum of fractions with the same denominator. ☐ Write equations to represent fraction decomposition. ☐ Decompose fractions greater than 1 into a sum of a whole number and a fraction less than 1. ☐ Reason about addition of fractions with the same denominator using a number line	Cool downs Section Checkpoints Practice problems
Section B	I can add and subtract fractions and mixed numbers with like denominators. ☐ Reason about addition and subtraction of fractions with the same denominator using a number line. ☐ Subtract fractions and mixed numbers by decomposing numbers and reasoning about equivalence. I can decompose a fraction in more than one way. ☐ Recognize that a fraction can be decomposed into a sum of fractions with the same denominator. ☐ Write equations to represent fraction decomposition. ☐ Decompose fractions greater than 1 into a sum of a whole number and a fraction less than 1. ☐ Subtract a fraction from a whole number by decomposing the whole number and reasoning about equivalence. I can create line plots to display fractional measurement data and use the information to solve problems. ☐ Analyze and interpret fractional measurement data on line plots. ☐ Organize measurement data in fractions of a unit $(\frac{1}{8}, \frac{1}{4}, \frac{1}{2})$ onto line plots. ☐ Use information on line plots to solve problems involving addition and subtraction of fractions and mixed numbers.	
Section C	I can add and subtract fractions and mixed numbers with like denominators. ☐ Use equivalence to reason about addition and subtraction problems. ☐ Use equivalent fractions to add tenths and hundredths, up to a sum of 1.	

	☐ Use equivalent fractions to add tenths and hundredths, where the sum is greater than 1. ☐ Find the sum of three or more tenths and hundredths, using the commutative and associative properties strategically. ☐ Interpret and solve problems that involve the addition, subtraction, and multiplication of fractions. ☐ Use addition, subtraction, and multiplication of fractions to model and solve a design problem.	

Unit Title:
Unit 4: From Hundredths to Hundred Thousands
Relevant Standards: Bold indicates priority
4.NF.C.5: Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.2 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100. **4.NF.C.6: Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.** **4.NF.C.7: Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.** **4.NBT.A.1: Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.** **4.NBT.A.2: Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.** **4.NBT.A.3: Use place value understanding to round multi-digit whole numbers to any place.** **4.NBT.B.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.**

Essential Question(s):	**Enduring Understanding(s):**
• How is our number system organized? • How can understanding place value help us? • What are equivalent fractions and decimals? • How do the properties of operations make computation simpler? • How do we decide what operation to use when solving a real-world problem?	• Our number system is a base-ten system. A given place value is ten times greater than the value of the place to its right (500 is ten times greater than 50). • The place value system of whole numbers can be expanded to represent numbers less than 1. • Understanding place value enables us to represent, compare order and round numbers and perform computations. • A number can be written as a fraction, e.g., 17/100, or as a decimal, e.g., 0.17. • Decimals can only be compared when the decimals being compared refer to the same whole. • Decimals written as tenths or hundredths can be compared using equivalent fraction. • Numbers can be expressed in standard form, word form, and expanded form. • Rounding helps us solve problems mentally and assess the reasonableness of an answer. • Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler. • There are different algorithms based on place-value understanding that can be used to add or subtract numbers. • The operation you choose to solve a problem depends on what you are trying to find and how the quantities in the problem relate to each other.

<table>
<tr><th>Demonstration of Learning:</th><th>Pacing for Unit</th></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>Unit Pacing: 33 days (22 required lessons, 9 flex, 2 assessment and reaction)</td></tr>
<tr><th>Family Overview (link below)</th><th>Integration of Technology:</th></tr>
<tr><td>Family Support Video Unit 4
Family Support Materials Unit 4 (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><th>Unit-specific Vocabulary:</th><th>Aligned Unit Materials, Resources, and Technology (beyond core resources):</th></tr>
<tr><td>
<table>
<tr><td>fraction</td><td>whole number</td><td>multiple</td></tr>
<tr><td>equivalent fraction</td><td>numerator</td><td>denominator</td></tr>
<tr><td>decimal</td><td>decimal notation</td><td>number line</td></tr>
<tr><td>tenths</td><td>hundredths</td><td>comparison</td></tr>
<tr><td>greater than ></td><td>less than <</td><td>equal to =</td></tr>
<tr><td>multi-digit</td><td>place value</td><td>ones</td></tr>
<tr><td>tens</td><td>hundreds</td><td>thousands</td></tr>
<tr><td>ten thousands</td><td>hundred thousands</td><td>millions</td></tr>
<tr><td>multiplication</td><td>digit</td><td>expanded form</td></tr>
<tr><td>written form</td><td>word form</td><td>parentheses</td></tr>
<tr><td>round</td><td>add</td><td>subtract</td></tr>
<tr><td>sum</td><td>difference</td><td>standard algorithm</td></tr>
</table>
</td><td>ST Math
District - approved online resources</td></tr>
<tr><th>Opportunities for Interdisciplinary Connections:</th><th>Anticipated conceptions:</th></tr>
<tr><td>Grade 4 Science: Unit 1:
Use decimal notation to record precise measurements of rainfall and erosion
Create and interpret graphs of weather data using decimals
Working with large numbers in geological contexts.</td><td>Students use whole number thinking when working with decimals. For example, students may think that the more digits after the decimal point, the greater the value, i.e. 0.25 is greater than 0.3.

Students may have conceptions about writing numerals from verbal descriptions. Numbers like one thousand do not cause a problem; however a number like one thousand two may cause problems for students. Many</td></tr>
</table>

	students will understand the 1000 and the 2 but then instead of placing the 2 in the one's place, students will write the numbers as they hear them, 10002 (ten thousand two). Students often assume that the first digit of a multi-digit number indicates the magnitude of a number. The assumption is made that 954 is greater than 1002 because students are focusing on the first digit instead of the number as a whole. Students need to be aware of the greatest place value. Students may not have a conceptual understanding of place value so they would think 561 – 147 = 426, because they subtract the 7 in 147 from the 1 in 561 instead of decomposing and creating a new unit.
Connections to Prior Units:	**Connections to Future Units:**
Grade 2 Unit 5 Grade 3, Unit 3 Grade 3, Unit 5	Grade 5, Unit 5
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement - Welcoming Interests and Identities • Optimize choice and autonomy (tools used for exploration and production) (7.1) **Representation - Perception** • Support multiple ways to perceive information (1.2) **Representation - Building Knowledge** • Connect prior knowledge to new learning (3.1) • Highlight and explore patterns, critical features, big ideas and relationships (3.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others orally and in writing. (4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson	Learning Target & Success Criteria	Assessment/ Resources

Sequence		
Unit 4 Planning Map		
Section A	I can read, write, and represent decimals through hundredths. ☐ Make sense of tenths and hundredths in decimal notation using unit square grids. ☐ Read and write decimals in standard form. ☐ Read and write decimal numbers in expanded form. I can compare two decimals through hundredths. ☐ Reason about and compare the size of decimals to hundredths using decimal squares and number lines. ☐ Compare and order decimals to hundredths by reasoning about their size. ☐ Compare and order fractions to the hundredths by reasoning about their size.	Cool downs Section Checkpoints Practice problems
Section B	I can explain the patterns found in place value. ☐ Describe that the value of a digit in one place represents ten times what it represents in the place to its right. ☐ Write equations to show that each place in a multi-digit number is ten times the value of the place to its immediate right. ☐ Describe the relative magnitude of multi-digit whole numbers within 1,000,000 using a number line and place value understanding. I can read, write, and represent numbers to 1,000,000. ☐ Develop a sense of the relative magnitude of 1,000,000. ☐ Recognize one-million as 10 groups of 100,000. ☐ Represent, read, and write multi-digit whole numbers within 1,000,000, including in expanded form.	
Section C	I can compare two multi-digit numbers using the symbols <, >, =. ☐ Compare 2 multi-digit whole numbers within 1,000,000 using place value reasoning. ☐ Compare and order multi-digit whole numbers within 1,000,000. I can round numbers to any place. ☐ Identify the closest multiples of 1,000, 10,000, and 100,000 to a given whole number. ☐ Round multi-digit whole numbers to the nearest 1,000, 10,000, and 100,000. ☐ Describe how rounding can help or hinder problem-solving. ☐ Round multi-digit whole numbers within 1,000,000 to solve problems.	
Section D	I can add and subtract multi-digit whole numbers using the standard algorithm. ☐ Interpret and solve problems that involve finding sums and differences of multi-digit whole numbers.	

Unit Title:
Unit 5: Multiplicative Comparison and Measurement
Relevant Standards: Bold indicates priority
4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. **4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.** **4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.** **4.NBT.B.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.** **4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.** **4.NF.B.3: Understand a fraction a/b with a > 1 as a sum of fractions 1/b.** **4.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.** 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two- column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ... 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale. 4.MD.B.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

Essential Question(s):	**Enduring Understanding(s):**
• How can we use multiplication to compare quantities? • How do we convert units of time or measure?	• Comparisons can be additive or multiplicative depending on the mathematical situation. • In multiplicative comparisons, the relationship between quantities is described in terms of how many times larger one is than the other • Larger units can be expressed in terms of smaller units. • The number of units used to measure an object will depend on the size of the unit of measure. • The larger the unit, the smaller the measurement reads; the smaller the unit, the larger the measurement reads. • Metric units are related by powers of ten. • We convert units of time or measure by

	understanding how the units are related to each other (e.g. one foot is 12 times as much as one inch).
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	Unit Pacing: 24 days (17 required lessons, 5 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
Family Support Video Unit 5 Family Support Materials Unit 5 (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**

multiplication	multiplicative comparison	times as many
additive	diagram	expression
equation	unknown	symbol
division	reasoning	statement
one-step problem	two-step problem	multiple
quantity	value	convert
measurement	unit	Metric system
kilometer	meter	centimeter
millimeter	gram	kilogram
milliliter	liter	table
interval	decimal notation	perimeter
area	adjacent	strategy
line diagrams	hours	minutes
elapsed time	liquid volume	mass

ST Math
District - approved online resources

Opportunities for Interdisciplinary Connections:	**Anticipated conceptions:**
Grade 4 Science: Unit 3: • Use measurement and multiplicative	Students may confuse multiplicative comparison with additive comparison.

comparison to analyze energy transfer in experiments • Apply fraction concepts when measuring and recording energy data • Create line plots to display energy measurements • Using multiplication to analyze force and motion data	Students may focus on key words which can be misleading. Consider: There were 4 jackets left on the playground on Monday and 5 jackets left on the playground on Tuesday. How many jackets were left on the playground? "Left" in this problem does not mean subtract. Many problems do not have any key words. For example, How many legs do 7 elephants have?, does not have a key word. However, students should be able to solve the problem by thinking and drawing a picture or building a model. The most important strategy, when solving a problem, is to make sense of the problem's context and actions. Key words encourage students to ignore meaning and look for a formula. Mathematics is about meaning (Van de Walle, 2012). When converting from a larger unit of measure to a smaller unit, students may divide rather than multiply. Students need to understand that you need more of the smaller units.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3, Unit 1 Grade 3, Unit 6	Grade 5, Unit 3 Grade 5, Unit 5 Grade 5, Unit 6
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Engagement - Welcoming Interests & Identities • Optimizing choice and autonomy (7.1) **Engagement - Sustaining Effort** • Foster collaboration, interdependence and collective learning (8.3) **Representation - Building Knowledge** • Connect prior knowledge to new learning (3.1)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others	See Illustrative Math Teachers Guide for identified lesson "Goals"

orally and in writing. (4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 5 Planning Map		
Section A	I can analyze, describe, represent, and solve multiplicative comparison situations. ☐ Interpret different representations of multiplicative comparison (situations, diagrams, and equations). ☐ Represent and solve multiplicative comparison problems, including those involving unknown factors. ☐ Represent and solve multiplicative comparison problems with larger numbers. ☐ Write, represent, and solve multiplicative comparison problems involving "10 times as many." ☐ Solve multi-step problems that involve multiplicative comparison and measurement with whole numbers and fractions. ☐ Use multiplicative comparison and unit conversion to solve multi-step problems about weight and capacity (in pounds, ounces, gallons, quarts, and cups). ☐ Use multiplicative comparison and unit conversion to solve multi-step problems about length (in yards, feet, inches).	Cool downs Section Checkpoints Practice problems
Section B	I can use the relationship between units to make conversions from larger units to smaller units within a given system of measurement. ☐ Express meters in terms of centimeters. ☐ Understand the relative size of meters and centimeters. ☐ Describe the multiplicative relationship between kilometers and meters. ☐ Express kilometers in terms of meters. ☐ Describe the multiplicative relationships between liters and milliliters, and kilograms and grams. ☐ Express liters in terms of milliliters, and kilograms in terms of grams. ☐ Describe the multiplicative relationship between pounds and ounces. ☐ Express pounds in terms of ounces. ☐ Describe the multiplicative relationships between units of time. ☐ Express hours in terms of minutes and seconds. I can solve measurement word problems using the four operations. ☐ Solve multi-step problems involving measurement conversions. ☐ Multiply or divide to solve one- and two-step problems involving multiplicative comparison. ☐ Solve multi-step problems that involve multiplicative comparison and measurement with whole numbers.	

Section C	I can use the relationship between units to make conversions from larger units to smaller units within a given system of measurement. ☐ Describe the multiplicative relationships between customary units of capacity. I can solve real-world problems involving all four operations. ☐ Explain strategies for solving multi-step problems about units of weight and capacity. ☐ Explain strategies for solving multi-step problems about units of length. ☐ Determine the perimeter and the side lengths of rectangles. ☐ Use multiplication to compare the perimeters of rectangles. ☐ Explain strategies for solving problems involving perimeter that include multiplicative comparison and addition and subtraction of fractions. ☐ Solve problems involving the perimeter of rectangles using multiplicative comparison. ☐ Solve problems involving perimeter using multiplicative comparison and addition or subtraction of fractions (including mixed numbers)	

Unit Title:	
Unit 6: Multiplying and Dividing Multi-Digit Numbers	
Relevant Standards: Bold indicates priority	
4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. **4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.** 4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. 4.OA.C.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.= **4.NBT.B.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.** **4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.** **4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.**	
Essential Question(s):	**Enduring Understanding(s):**

<table>
<tr><td>

- Why do we analyze patterns?
- How can understanding place value help us?
- How do the properties of operations make computation simpler?
- How are multiplication and division related?
- How do we decide what operation to use when solving a real-world problem?

</td><td>

- Analyzing patterns helps us make predictions, identify trends, and form rules to solve problems.
- Understanding place value enables us to represent, compare order and round numbers and perform computations.
- Properties of operations allow us to reorder, decompose and/or compose numbers in order to make computation simpler.
- There is a relationship between multiplication and division. Multiplication involves putting equal groups together, while division involves breaking groups apart or sharing equally.
- The operation you choose to solve a problem depends on what you are trying to find and how the quantities in the problem relate to each other.

</td></tr>
<tr><td>Demonstration of Learning:</td><td>Pacing for Unit</td></tr>
<tr><td>Checkpoints
Cool Downs
Unit Assessments</td><td>Unit Pacing: 32 days (25 required lessons, 5 flex, 2 assessment and reaction)</td></tr>
<tr><td>Family Overview (link below)</td><td>Integration of Technology:</td></tr>
<tr><td>Family Support Video Unit 6
Family Support Materials Unit 6 (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><td>Unit-specific Vocabulary:</td><td>Aligned Unit Materials, Resources, and Technology (beyond core resources):</td></tr>
<tr><td>

multiplication equation	multiplication comparison	operations
equation	expression	estimation
rounding	dividend	divisor
quotient	partial quotient	remainder
unknown quantity	multistep	reasonableness
factor	product	multiple
number pattern	shape pattern	generate
identify	features	rule

</td><td>ST Math
District - approved online resources</td></tr>
<tr><td>Opportunities for Interdisciplinary Connections:</td><td>Anticipated conceptions:</td></tr>
</table>

Grade 4 Science: Unit 1: • Calculating with large numbers in geological timescales • Solving problems involving rock layer formation rates • Working with measurements in earth science investigations	Students have difficulty estimating a two-step problem. Students do not always solve all of the steps needed for a multistep problem. Students may not be able to identify which part of the equation is unknown in order to represent it as a variable. Students often do not understand why they need to regroup and just subtract the smaller digit from the larger one. Emphasize place value and the meaning of each of the digits. When converting from a larger unit of measure to a smaller unit, students may divide rather than multiply. Students need to understand that you need more of the smaller units. Students may assume all patterns have the same rule due to limited exposure. When working with multiplication and division, students often do not think about the importance of place value. They treat each digit in the factor or dividend separately without looking at the value of the entire number. Encourage students to explore different strategies and consider the relationship between multiplication and division. Estimating by using multiplication prior to dividing, helps students see what a reasonable quotient will be. When interpreting remainders, some students do not attend to the context of the situation.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3, Unit 4 Grade 4, Unit 1	Grade 5, Unit 4 Grade 5, Unit 5 Grade 5, Unit 7
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Action & Expression - Expression & Communication • Use multiple tools for construction, composition and creativity (5.2) **Representation - Building Knowledge** • Connect prior knowledge to new learning (3.1) **Action and Expression - Expression & Communication** • Build fluencies with graduated support for practice and performance (5.3)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**

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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others orally and in writing. (4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	**Learning Target & Success Criteria**	**Assessment/ Resources**
Unit 6 Planning Map		
Section A	I can generate a number or shape pattern that follows a given rule. ☐ Analyze and describe number and shape patterns. ☐ Analyze, describe, and generate patterns that follow a given rule. ☐ Analyze patterns represented visually and numerically. ☐ Use numbers, words, and the idea of factors and multiples to describe and extend patterns in the features of rectangles. ☐ Analyze and describe patterns in numbers that follow a rule. ☐ Use understanding of place value and operations to explain and extend patterns of numbers.	Cool downs Section Checkpoints Practice problems
Section B	I can represent and solve multi-digit multiplication problems. ☐ Multiply multi-digit numbers using strategies based on place value and the properties of operations. ☐ Multiply multi-digit whole numbers by one-digit numbers using an algorithm that uses partial products. ☐ Identify similarities and differences between algorithms that use partial-products and the standard algorithm for multiplication.	
Section C	I can represent and solve multi-digit division problems. ☐ Understand that a division situation may involve equal groups, factors and multiples, or area of rectangles. ☐ Divide multi-digit numbers using base-ten blocks and diagrams. ☐ Find whole-number quotients using partial quotients. ☐ Interpret the result and remainder of division in situations.	
Section D	I can solve real-world problems involving all four operations. ☐ Solve multi-step problems involving measurement conversions, perimeter, and area. ☐ Assess the reasonableness of responses.	

Unit Title:

Unit 7: Angles and Angle Measurement

Relevant Standards: Bold indicates priority

4.NBT.B.4: Fluently add and subtract multi-digit whole numbers using the standard algorithm.
4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
4.MD.C.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
4.MD.C.5.A An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.
4.MD.C.5.B An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Essential Question(s):	**Enduring Understanding(s):**
• How do points, lines, and rays help us describe and understand the world around us? • How are angles measured? • What does the measure of an angle tell us?	• Points, lines, and rays are basic building blocks in geometry that help us describe shapes and understand how objects are positioned in space. • A point is a location in space; it has no length, width, or height. • A line is a continuous straight path that extends indefinitely in two opposite directions. • A line segment is a continuous straight path between two points. • A ray is a continuous straight path that extends indefinitely in one direction from one point. • Angles are formed when two rays share a common endpoint; the common endpoint of the rays is called a vertex. • Angles are measured in degrees using a protractor. • There are 360 degrees in a circle. One degree is 1/360 of a circle. • The measure of or number of degrees in an angle tells us how far one ray (side) of the angle is rotated from the other. • Angles can be decomposed into unit angles. (n degrees is *n* one degree angles.)
Demonstration of Learning:	**Pacing for Unit**
Checkpoints	Unit Pacing: 20 days (15 required lessons, 3 flex, 2

<table>
<tr><td>Cool Downs
Unit Assessments</td><td>assessment and reaction)</td></tr>
<tr><td>Family Overview (link below)</td><td>Integration of Technology:</td></tr>
<tr><td>Family Support Video Unit 7
Family Support Materials Unit 7 (all languages)</td><td>Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning</td></tr>
<tr><td>Unit-specific Vocabulary:</td><td>Aligned Unit Materials, Resources, and Technology (beyond core resources):</td></tr>
<tr><td>
<table>
<tr><td>angle</td><td>degree</td><td>ray</td></tr>
<tr><td>circle</td><td>endpoint</td><td>geometric shape</td></tr>
<tr><td>measure</td><td>protractor</td><td>additive</td></tr>
<tr><td>sum</td><td>decompose</td><td>equation</td></tr>
<tr><td>symbol</td><td>unknown angle</td><td>point</td></tr>
<tr><td>vertex</td><td>line</td><td>line segment</td></tr>
<tr><td>intersecting lines</td><td>perpendicular lines</td><td>parallel lines</td></tr>
<tr><td>acute angle</td><td>obtuse angle</td><td>straight angle</td></tr>
<tr><td>right angle</td><td>two-dimensional figures</td><td></td></tr>
</table>
</td><td>ST Math
District - approved online resources</td></tr>
<tr><td>Opportunities for Interdisciplinary Connections:</td><td>Anticipated conceptions:</td></tr>
<tr><td>Grade 4 Science: Unit 3:
Study wave patterns using angle measurements.
Analyze wave amplitude using measurement and comparison.
Use geometric concepts to understand wave reflection.</td><td>Students believe a wide angle with short sides has a smaller measurement than a narrow angle with long sides because they focus on the length of the rays rather than the spread of the rays.

Students are unsure of which numbers to use when measuring angles using a protractor.

Students believe that if they do not see a pair of lines intersect, those lines are parallel.

Students may not recognize angles larger than 180° as angles.</td></tr>
<tr><td>Connections to Prior Units:</td><td>Connections to Future Units:</td></tr>
<tr><td>Grade 3, Unit 7</td><td>Grade 5, Unit 7</td></tr>
<tr><td colspan="2">Differentiation through Universal Design for Learning</td></tr>
</table>

UDL Indicator	Teacher Actions:
Representation - Language and Symbols • Clarify vocabulary, symbols, and language structures (2.1) **Action and Expression - Expression & Communication** • Use multiple tools for construction, composition and creativity (5.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
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. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others orally and in writing. (4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	See Illustrative Math Teachers Guide for identified lesson "Goals"

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 7 Planning Map		
Section A	I can draw and identify points, lines, rays, segments, angles, and parallel and intersecting lines in geometric figures. ☐ Draw points, lines, and line segments, and identify them in geometric figures. ☐ Draw and identify parallel and intersecting lines. ☐ Identify angles in two-dimensional figures.	
Section B	I can measure and draw angles using degrees. ☐ Recognize angles as geometric figures that are formed wherever two rays share a common endpoint. ☐ Understand that the measure of a full rotation of a ray at a fixed point is 360 degrees. ☐ Use benchmark angle measurements (such as 90°, 180°, 270°, 360°) to reason about and estimate the size of angles in degrees. ☐ Recognize that 1 degree is a measurement of a 1/360 turn through a full circle. ☐ Use a protractor to measure or draw angles of given measurements. I can draw and identify perpendicular lines or rays. ☐ Identify and draw perpendicular lines.	

Section C	I can draw and identify acute, obtuse, right, and straight angles in two-dimensional figures. ☐ Identify acute, obtuse, right and straight angles in two-dimensional figures. I can solve problems involving unknown angles. ☐ Compose and decompose angles to determine their measurements. ☐ Reason about angle measurements within a circle. ☐ Represent angle relationships and solve for unknown angle measurements.	

Unit Title:	
Unit 8: Properties of Two-Dimensional Shapes	
Relevant Standards: Bold indicates priority	
4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. 4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry. 4.MD.A.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.	
Essential Question(s):	**Enduring Understanding(s):**
• How can polygons be compared, sorted and classified? • Why is symmetry important?	• Polygons can be compared, sorted and classified using attributes and relationships, such as number of sides, types of angles, and parallel and perpendicular sides. • Symmetry is used to describe and analyze figures and has many applications in the real world.
Demonstration of Learning:	**Pacing for Unit**
Checkpoints Cool Downs Unit Assessments	Unit Pacing: 11 days (7 required lessons, 2 flex, 2 assessment and reaction)
Family Overview (link below)	**Integration of Technology:**
Family Support Video Unit 8 Family Support Materials Unit 8 (all languages)	*Intentionally aligned use of digital tools and resources to support acquisition of content, researching, organizing and communicating learning*
Unit-specific Vocabulary:	**Aligned Unit Materials, Resources, and Technology (beyond core resources):**
right angle | acute angle | obtuse angle	ST Math District - approved online resources

two-dimensional figures	perpendicular lines	parallel lines
classify	equilateral triangle	scalene triangle
isosceles triangle	acute triangle	obtuse triangle
right triangle	line of symmetry	symmetry
perimeter	area	formula
length	width	square units

Opportunities for Interdisciplinary Connections:	**Anticipated conceptions:**
Grade 4 Science: Unit 3: • Designing and testing prototype shapes • Using geometric properties in engineering solutions • Applying symmetry and pattern concepts to design challenges	Students think that when describing geometric shapes and placing them in subcategories, the last category is the only classification that can be used. Students may misclassify a shape due to its orientation. For example, students may classify a square tipped on its side as a rhombus. Students believe a wide angle with short sides may seem smaller than a narrow angle with long sides. Students can compare two angles by tracing one and placing it over the other. Students will then realize that the length of the sides does not determine whether one angle is larger or smaller than another angle. The measure of the angle does not change.
Connections to Prior Units:	**Connections to Future Units:**
Grade 3, Unit 7	Grade 5, Unit 7
Differentiation through *Universal Design for Learning*	
UDL Indicator	**Teacher Actions:**
Representation - Language and Symbols • Clarify vocabulary, symbols, and language structures (2.1) **Action and Expression - Expression & Communication** • Use multiple tools for construction, composition and creativity (5.2)	See Illustrative Math Teachers Guide for identified "Access for Students with Disabilities" by lesson and activity.
Supporting Multilingual/English Learners	
Related *CELP standards:*	**Learning Targets:**
An EL can… • **participate** in grade appropriate oral and written	See Illustrative Math Teachers Guide for identified lesson "Goals"

exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions. (4-5.2) • **construct** grade appropriate oral and written claims and support them with reasoning and evidence. (4-5.4) • **analyze and critique** the arguments of others orally and in writing. (4-5.6) • **adapt** language choices to purpose, task, and audience when speaking and writing (4-5.7)	

Lesson Sequence	Learning Target & Success Criteria	Assessment/ Resources
Unit 8 Planning Map		
Section A	I can classify two-dimensional figures based on their attributes. ☐ Analyze the attributes of two-dimensional shapes and categorize the shapes in a way that makes sense to them. ☐ .Classify triangles based on their side lengths and size of their angles. ☐ Classify quadrilaterals based on the length of their sides, the size of their angles, and presence of parallel sides. I can identify and draw lines of symmetry in two-dimensional figures ☐ Describe lines of symmetry for two-dimensional figures and identify figures with line symmetry. ☐ Identify figures with line symmetry and draw lines of symmetry on two-dimensional figures.	
Section B	I can use my understanding of geometry to solve problems. ☐ Find the perimeter of two-dimensional shapes using their properties. ☐ Find the unknown side lengths of two-dimensional shapes using their attributes. ☐ Solve problems involving symmetry, side lengths, and perimeter of two-dimensional figures.	