



Intervention Math 7

Course Number: 2745

Course Level: Intervention

Grade: 7

Time/Credit: 1 year/ 47 minutes daily

Development Date: Fall 2025 - Summer 2026

School Board Approval:

Central Bucks School District
20 Welden Drive
Doylestown, PA 18901

Table of Contents

K – 12 Mathematics Program Learning Principles	3
Mathematics Program Enduring Understandings	4
Mathematics Program Essential Questions.....	6
Math Intervention 7 Overview	7
Math Intervention 7 Pacing Guide	8
Unit 1: Number Systems and Operations.....	17
Unit 2: Rational Number Operations.....	24
Unit 3: Model with Expressions, Equations, and Inequalities; Angle Relationships	31
Unit 4: Geometry	39
Unit 5: Sampling & Data Analysis	46
Unit 6: Probability	51

K – 12 Mathematics Program Learning Principles

Teaching and Learning Principles:

1. Teaching mathematics for understanding requires providing experiences that stimulate students' curiosity and build confidence in investigating, problem solving, and communicating (speaking, reading, writing, representing, and listening).
2. Differentiated instruction addresses student strengths, interests, and learning styles.
3. Instruction should be appropriately paced to make the curriculum accessible to all students.
4. High expectations with strong support from teachers, parents and administrators motivate all students to achieve excellence in mathematics.
5. To create new understanding, students must be actively engaged in learning experiences designed to connect to their prior knowledge.
6. Presenting new ideas within rich and meaningful contexts helps learners to transfer and use knowledge meaningfully.
7. Making connections both within and outside of school helps learners to transfer and use knowledge meaningfully.
8. The learning process is enhanced when new ideas are presented using manipulatives, computers, calculators, and real-time data collection devices.
9. Teacher collaboration and reflection enrich learning experiences for students.
10. Assessment is an ongoing process that guides instruction and monitors student progress to include mastery of mathematics content and higher-level thinking skills.

Documents Considered:

(2000). *Principles and Standards for School Mathematics*. Reston, VA: National Council of Teachers of Mathematics.

Kilpatrick, J., Swafford, J., & Findell, B. (2001). *Adding It Up: Helping Children Learn Mathematics*. Washington, DC: National Academy Press.

Marzano, R., & Pickering, D. (1997). *Dimensions of Learning*. Alexandria, VA: Association for Supervision and Curriculum Development; Aurora, CO: Mid-continent Regional Educational Laboratory.

Tomlinson, Carol Ann. (1999). *The Differentiated Classroom: Responding to the Needs of All Learners*. Alexandria, VA: Association for Supervision and Curriculum Development.

Zemelman, S., Daniels, H., & Hyde, A. (1998). *Best practice: New standards for teaching and learning in America's schools*. Portsmouth, NH: Heinemann.

Mathematics Program Enduring Understandings

Students will understand that:

The Nature of Mathematics

- Mathematics is a language of carefully defined terms and symbols.
- Mathematics is used to make informed decisions about problems in everyday life.

Numbers and Operations

- There are multiple representations for any number.
- Numbers are classified and compared within our number system.
- Depending on the situation, calculations may be done using mental math or paper-and-pencil calculations using a variety of mathematically sound algorithms.
- Estimates help determine the reasonableness of an answer.
- Expressions are simplified using a predetermined order of operations.

Measurement

- Measurements collected using any tools (except for counting) are estimates with an accepted level of error.
- All measurements consist of exactly three parts: number, unit, and precision.
- Changing one linear dimension in a figure with two or three dimensions will have a different effect on the figure's perimeter, circumference, area, or volume.

Geometry

- Points, lines, and planes are the building blocks of geometry.
- Each geometric figure has a specific naming convention.
- Postulates, theorems, definitions, and properties are used to:
 - justify reasoning in a direct proof.
 - establish relationships involving two and three-dimensional figures.
- Logical thinking and critical reasoning skills are important aspects of problem solving.
- A shape's characteristics (dimensionality, side measures, angle measures, faces, edges, area, perimeter, and volume) are used for identification.
- The Pythagorean Theorem and trigonometric ratios are used to find missing quantities in right triangles.
- Concepts of congruency and similarity are used to relate and compare 2 and 3- dimensional figures.

Algebraic Concepts

- Algebraic rules and properties determine how expressions are simplified and how equations are solved.
- Problems involving a constant rate of change can be modeled using proportional reasoning.
- Algebraic expressions, equations, inequalities, and functions (linear, absolute value, quadratic, polynomial, exponential, and logarithmic) are used to model relationships between quantities in real-world situations.

- Patterns and functions can be generalized and represented using verbal models, tables, equations, and graphs.
- Systems of equations are solved both graphically and algebraically and are used to model real-life problems.

Data Analysis and Probability

- Data is collected, organized, and displayed for analysis.
- Interpretations and predictions about data are influenced by the method that data is collected and displayed.
- Probability is used to make informed predictions and inferences.

Mathematics Program Essential Questions

The Nature of Mathematics

- What characteristics make mathematics a language?
- When is the correct solution not the answer to a problem?

Numbers and Operations

- How do you know that an answer is reasonable?
- Why are there different number systems?
- How do you determine when to calculate with pencil and paper, find an estimate, or use a calculator?
- What does it mean to be simplified?
- Is there more than one way to simplify an expression?

Measurement

- What does it mean to be accurate?
- How do you measure?
- How does changing a dimension effect a figures length, area, and volume?

Geometry

- Why do all statements need justification?
- What is the logical progression of statements in a proof?
- How are figures classified?
- How do you name a geometric figure and why are standard naming conventions important?
- Why are points, lines, and planes so important in Euclidean geometry?
- How and when is the Pythagorean Theorem used?
- What do similarity and congruency statements tell you about polygons?

Algebraic Concepts

- What does solve mean?
- Is your solution always the appropriate answer to a problem?
- How do expressions and equations differ?
- What makes a relationship linear?
- How can a line be used to make predictions?
- When is it necessary to use a system of equations?
- Why would you represent a pattern/function in different ways?

Data Analysis and Probability

- What is the purpose of collecting data?
- How is data used or abused?
- How do we make predictions based on probability?

Math Intervention 7 Overview

Desired Results

Course Description: This course is designed for students who would benefit from additional support to meet grade-level standards in mathematics. It focuses on reinforcing foundational skills and addressing learning gaps to build confidence and competence in core concepts.

Prerequisite: None

Committee Members: Katie Marttila, Mike Lechniak, Nicole Barlow, Brian Novick.

Pacing Guide

Math Intervention 7 Pacing Guide

Course Overview	Days
Semester 1A – Unit 1	33
Semester 1B – Unit 2	24
Semester 1C – Unit 3	24
Semester 1 – Total Days	81
Semester 2A – Unit 3, Cont.	19
Semester 2B – Unit 4	27
Semester 2C – Unit 5	11
Semester 2D – Unit 6	16
Semester 2 – Total Days	73
Beginning of Year Activities/Review/Remediation	5
IXL Screener Arena	6
Flex Days – Field Trips, Snow Days, Half Days, Assemblies, School Activities, etc.	12
PSSA Testing – 1 Day for ELA, 2 Days for Math	3
Total Days	180

Semester 1A – 33 days	
Unit 1 – Number Systems and Operations	
Aligned with Into Math Modules 1 and Module 2	
Grade 7, Mission 2, Topic A – Representing Proportional Relationships with Tables	
Lesson 1: <i>One of These Things Is Not Like the Others (Online Only)</i>	.5
Lesson 2: <i>Introducing Proportional Relationships with a Table</i>	1
Lesson 3: <i>More About Constant of Proportionality</i>	1
Foundational Lessons: G6M3 Lesson 4: Use double number lines, tables, and thinking about "how much for 1" to convert measurement units. For additional support, G6M3 Lessons 1, 3-4.	
Flex & Progress Check #1	2
Grade 7, Mission 2, Topic B – Representing Proportional Relationships with Equations	
Lesson 4: <i>Proportional Relationships and Equations</i>	1
Lesson 6: <i>Using Equations to Solve Problems</i>	1
Foundational Lessons: G6M3 Lesson 7: Identify a unit rate and use it to solve ratio problems. For additional support, G6M3 Lessons 5-7.	
Flex & Progress Check #2	2
Grade 7, Mission 2, Topic C – Comparing Proportional and Nonproportional Relationships	
Lesson 7: <i>Comparing Relationships with Tables</i>	1
Lesson 8: <i>Comparing Relationships with Equations</i>	1
Lesson 9: <i>Solving Problems about Proportional Relationships</i>	1
Foundational Lessons: G6M3 Lesson 8: Use unit rates to solve problems involving constant speed.	
Mid-Mission Assessment: Topics A-C – Progress Check #3	2
Grade 7, Mission 2, Topic D – Representing Proportional Relationships with Graphs	
Lesson 10: <i>Introducing Graphs of Proportional Relationships</i>	1
Lesson 11: <i>Interpreting Graphs of Proportional Relationships</i>	1
Lesson 12: <i>Using Graphs to Compare Relationships</i>	1
Foundational Lessons: G6M6 Lesson 17: Create a table, graph, and equations to represent the relationship between distance and time for an object moving at a constant speed. For additional support, G6M6 Lessons 16-17.	
Flex & Progress Check #4	2
Grade 7, Mission 2, Topic E – Let's Put it to Work	
Lesson 14: <i>Four Representations</i>	1
Foundational Lessons: G7M2 Lesson 13: Interpret and compare the same proportional relationship using two different sets of tables, graphs, and equations.	
End-of-Mission Assessment: Topics D-E – Progress Check #5	2
Grade 7, Mission 4, Topic B – Percent Increase and Decrease	
Lesson 6: <i>Increasing and Decreasing</i>	1

Lesson 7: <i>One Hundred Percent</i>	1
Foundational Lessons: G6M3 Lesson 11: <i>Use double number lines to find percentages.</i>	
Lesson 8: <i>Percent Increase and Decrease with Equations</i>	1
Lesson 9: <i>More and Less than 1%</i>	1
Foundational Lessons: G6M6 Lesson 7: <i>Use equations to solve problems involving percentages.</i>	
Flex & Progress Check #6	2
Grade 7, Mission 4, Topic C – Applying Percents	
Lesson 10: <i>Tax and Tip</i>	1
Lesson 11: <i>Percentage Context</i>	1
Lesson 12: <i>Find the Percentage</i>	1
Lesson 14: <i>Percent Error (Online Only)</i>	.5
Foundational Lessons: G6M3 Lesson 14: <i>Use a double number line diagram to solve percentage problems. For additional support, G6M3 Lessons 12-14.</i>	
End-of-Mission Assessment: Topics B-D – Progress Check #7	2

Semester 1B – 24 days	
Unit 2 – Rational Number Operations	
Aligned with Modules 3 - 6	
Grade 7, Mission 5, Topic A – Interpreting Negative Numbers	
Lesson 1: <i>Interpreting Negative Numbers</i>	1
Foundational Lessons: G6M7 Lesson 5: <i>Interpret and use negative numbers in different contexts, including situations involving money. For additional support, G6M7 Lesson 1.</i>	
Grade 7, Mission 5, Topic B – Adding and Subtracting Rational Numbers	
Lesson 2: <i>Changing Temperatures</i>	1
Lesson 3: <i>Changing Elevation</i>	1
Lesson 4: <i>Money & Debts</i>	1
Foundational Lessons: G6M7 Lesson 2: <i>Plot positive and negative numbers on a number line and understand opposites.</i>	
Flex & Progress Check #1	2
Lesson 5: <i>Representing Subtraction</i>	1
Lesson 6: <i>Subtracting Rational Numbers</i>	1
Lesson 7: <i>Adding and Subtracting to Solve Problems</i>	1
Foundational Lessons: G6M7 Lesson 6: <i>Use absolute value notation to describe a number's distance from zero.</i>	
Mid-Mission Assessment: Topics A-B – Progress Check #2	2

Grade 7, Mission 5, Topic C – Multiplying and Dividing Rational Numbers	
Lesson 8: <i>Position Speed & Direction</i>	1
Lesson 9: <i>Multiplying Rational Numbers</i>	1
Lesson 11: <i>Dividing Rational Numbers</i>	1
Foundational Lessons: G6M4 Lesson 5: Use diagrams and multiplication and division equations to represent and solve “how many groups?” questions in which the divisor is a non-unit fraction. For additional support, G6M4 Lessons 4-5.	
Flex & Progress Check #3	2
Grade 7, Mission 5, Topic D – Four Operations with Rational Numbers	
Lesson 13: <i>Expressions with Rational Numbers</i>	1
Lesson 14: <i>Solving Problems with Rational Numbers</i>	1
Foundational Lessons: G6M6 Lesson 14: Use the order of operations to evaluate expressions with exponents, multiplication, division, addition, and subtraction.	
Flex & Progress Check #4	2
Grade 7, Mission 5, Topic E – Solving Equations Where There are Negative Numbers	
Lesson 15: <i>Solving Equations with Rational Numbers</i>	1
Lesson 16: <i>Representing Context with Equations</i>	1
Foundational Lessons: G6M6 Lesson 4: Interpret and solve equations that represent the same situation.	
End of Mission Assessment: Topics C-E – Progress Check #5	2

Semester 1C – 24 days	
Unit 3 – Model with Expressions, Equations	
Aligned with Modules 7 & 9*	
*Module 9 is teacher specific	
Grade 7, Mission 6, Topic D – Writing Equivalent Expressions	
Lesson 18: <i>Subtraction in Equivalent Expressions</i>	1
Lesson 19: <i>Expanding and Factoring</i>	1
Lesson 20: <i>Combining Like Terms (Part 1)</i>	1
Lesson 21: <i>Combining Like Terms (Part 2)</i>	1
Lesson 22: <i>Combining Like Terms (Part 3)</i>	1
Flex & Progress Check #1	2
Foundational Guidance: G6M6 Lesson 10: Use an area diagram and the distributive property to write equivalent expressions with variables. For additional support, G6M6 Lessons 8-10.	
Grade 7, Mission 6, Topic A - Representing Situations of the Form $px + q = r$ and $p(x + q) = r$	
Lesson 1: <i>Relationships between Quantities</i>	1

Foundational Lesson: G7M2 Lesson 7: Use a table of values to determine if a relationship is proportional.	
Lesson 2: <i>Reasoning about Contexts with Tape Diagrams (Part 1)</i>	1
Lesson 3: <i>Reasoning about Contexts with Tape Diagrams (Part 2)</i>	1
Flex & Progress Check #2	2
Lesson 4: <i>Reasoning about Equations and Tape Diagrams (Part 1)</i>	1
Lesson 5: <i>Reasoning about equations and Tape Diagrams (Part 2)</i>	1
Lesson 6: <i>Distinguishing between Two Types of Situations</i>	1
Foundational Lessons: G6M6 Lesson 1: Use tape diagrams to write equations and solve for unknown values. For additional support, G6M2 Lesson 15.	
Flex & Progress Check #3	2
Grade 7, Mission 6, Topic B – Solving Equations of the form $px + q = r$ and $p(x + q) = r$	
Lesson 7: <i>Reasoning about Solving Equations (Part 1)</i>	1
Lesson 8: <i>Reasoning about Solving Equations (Part 2)</i>	1
Lesson 9: <i>Dealing with Negative Numbers</i>	1
Lesson 10: <i>Different Options for Solving One Equation</i>	1
Lesson 11: <i>Using Tape Diagrams and Equations to Solve Problems</i>	1
Foundational Lessons: G6M6 Lesson 5: Divide using fractions when solving equations in the form of $px = q$. . For additional support, G6M6 Lessons 2-5	
Mid-Mission Assessment: Topics A-B – Progress Check #4	2

Mid-Year Movement

Semester 2A – 19 days	
Cont., Unit 3 – Angle Relationships & Inequalities	
Aligned with Modules 8, 10 & 11	
Grade 7, Mission 7, Topic A – Angle Relationships	
Lesson 1: <i>Relationships of Angles</i>	1
Lesson 2: <i>Adjacent Angles</i>	1
Lesson 3: <i>Nonadjacent Angles</i>	1
Lesson 4: <i>Solving for Unknown Angles</i>	1
Lesson 5: <i>Using Equations to Solve for Unknown Angles</i>	1
Foundational Lessons: G4M4 Lesson 10: Use the addition of adjacent angle measures to solve problems using a symbol for the unknown angle measure. For additional support, G4M4 Lessons 9-10.	
Flex & Progress Check #1	2

Grade 7, Mission 7, Topic B – Drawing Polygons with Given Conditions	
Lesson 6: <i>Building Polygons (Part 1)</i>	1
Lesson 7: <i>Building Polygons (Part 2)</i>	1
Lesson 8: <i>Triangles with Three Common Measures</i>	1
Foundational Lessons: G5M5 Lesson 21: Draw and identify varied two-dimensional figures from given attributes. For additional support, G5M5 Lessons 16-21	
Mid-Mission Assessment: Topics A – B – Progress Check #2 *Remove <i>drawing triangles</i>*	2
Grade 7, Mission 6, Topic C - Inequalities	
Lesson 13: <i>Reintroducing Inequalities</i>	1
Lesson 14: <i>Finding Solutions to Inequalities in Context</i>	1
Lesson 15: <i>Efficiently Solving Inequalities</i>	1
Lesson 16: <i>Inequalities in Context</i>	1
Lesson 17: <i>Modeling with Inequalities</i>	1
Foundational Lessons: G6M7 Lesson 9: Explain what it means to be a solution to an inequality and identify them in contexts. For additional support, G6M7 Lessons 8-9.	
End-of-Mission Assessment: Topic C – Progress Check #3 (Move Topic D from assessment and add to Semester 1C Progress Check #1)	2

Semester 2B – 27 days	
Unit 4 – Geometry	
Aligned with Modules 10 & 11	
Grade 7, Mission 3, Topic A – Circumference of a Circle	
Lesson 1: <i>How well can you measure?</i>	1
Lesson 2: <i>Exploring Circles</i>	1
Lesson 3: <i>Exploring Circumference</i>	1
Lesson 4: <i>Applying Circumference</i>	1
Lesson 5: <i>Circumference & Wheels</i>	1
Foundational Lessons: G4M3 Lesson 1: Investigate and use the formulas for area and perimeter of rectangles.	
Flex & Progress Check #1	2
Grade 7, Mission 3, Topic B – Area of a Circle	
Lesson 6: <i>Estimating Areas</i>	1
Lesson 7: <i>Exploring the Area of a Circle</i>	1
Lesson 8: <i>Relating Area to Circumference</i>	1

Lesson 9: <i>Applying Area of Circles</i>	1
Foundational Lessons: G6M1 Lesson 11: Understand that you can find the area of a polygon by decomposing and rearranging it into rectangles and triangles. For additional support, G6M1 Lessons 1-6.	
Flex & Progress Check #2	2
Grade 7, Mission 3, Topic C – Let's Put it to Work	
Lesson 10: <i>Distinguishing Circumference and Area</i>	1
Lesson 11: <i>Stained-Glass Windows (optional)</i>	1
Foundational Lessons: G7M3 Lesson 8: Explain how the area of a circle and its circumference are related to each other and know and use the formula for area of a circle.	
End-of-Mission Assessment: Topics A – C – Progress Check #3	2
Grade 7, Mission 7, Topic C – Solid Geometry	
Lesson 11: <i>Slicing Solids</i>	1
Lesson 12: <i>Volume of Right Prisms</i>	1
Lesson 13: <i>Decomposing Bases for Area</i>	1
Foundational Lessons: G6M4 Lesson 14: Understand the connection between volume, unit cubes, and volume formula. For additional support, G5M5 Lessons 4-7	
Flex & Progress Check #4	2
Lesson 14: <i>Surface Area of Right Prisms</i>	1
Lesson 15: <i>Distinguishing Volume and Surface Area</i>	1
Lesson 16: <i>Applying Volume and Surface Area</i>	1
Foundational Lessons: G6M1 Lesson 15: Draw an accurate net of a polyhedron and use it to calculate the surface area. For additional support, G6M1 Lessons 12, 14-15.	
End-of-Mission Assessment: Topic C – Progress Check #5	2

Semester 2C – 11 days	
Unit 5 – Sampling & Data Analysis	
Aligned with Modules 12 & 13	
Grade 7, Mission 8, Topic C – Sampling	
Lesson 11: <i>Comparing Groups</i>	1
Lesson 12: <i>Larger Populations</i>	1
Lesson 13: <i>What makes a good sample?</i>	1
Lesson 14: <i>Sampling in a Fair Way</i>	1

Foundational Lessons: G6M8 Lesson 5: Use dot plots to describe distributions and answer questions about data sets. For additional support, G6M8 Lessons 4-5.

Flex & Progress Check #1	2
-------------------------------------	---

Grade 7, Mission 8, Topic D – Using Samples

Lesson 15: <i>Estimating Population Measures of Center</i>	1
--	---

Lesson 16: <i>Estimating Population Proportions</i>	1
---	---

Lesson 18: <i>Comparing Populations Using Samples</i>	1
---	---

Foundational Lessons: G6M8 Lesson 14: Choose which measure of center to use to describe a given data set and explain how the shape of the distribution affects the mean and median of a data set. For additional support, G6M8 Lessons 13-14

End-of-Mission Assessment: Topics C & D – Progress Check #2	2
--	---

Semester 2D – 16 days

Unit 6 – Probability

Aligned with Modules 14 & 15

Grade 7, Mission 8, Topic A – Probabilities of Single Step Events

Lesson 1: <i>Mystery Bags</i>	1
-------------------------------	---

Lesson 2: <i>Chance Experiments</i>	1
-------------------------------------	---

Lesson 3: <i>What are probabilities?</i>	1
--	---

Flex & Progress Check #1	2
-------------------------------------	---

Lesson 4: <i>Estimating Probabilities through Repeated Experiments</i>	1
--	---

Lesson 5: <i>More Estimating Probabilities</i>	1
--	---

Lesson 6: <i>Estimating Probabilities using Simulations (optional)</i>	1
--	---

Foundational Lessons: G7M4 Lesson 5: Use decimals to describe increases and decreases.

Flex & Progress Check #2	2
-------------------------------------	---

Grade 7, Mission 8, Topic B – Probabilities of Multi-Step Events

Lesson 7: <i>Simulating Multi-Step Experiments</i>	1
--	---

Foundational Lesson: G7M8 Lesson 6: Simulate real-world situations with simple experiments that reflect the probability of the actual event. For additional support, G7M8 Lessons 4-6.

Lesson 8: <i>Keeping Track of All Possible Outcomes</i>	1
---	---

Lesson 9: <i>Multi-Step Experiments</i>	1
---	---

Lesson 10: <i>Designing Simulations</i>	1
---	---

Foundational Lessons: G7M8 Lesson 3: List the sample space of a chance experiment and calculate the probability of an event when all outcomes are equally likely.

Mid-Mission Assessment: Topics A & B – Progress Check #3

2

Acceptable Evidence

- Progress Monitoring: Exit tickets, mid-mission assessments, and end-of-mission assessments
- Growth: Progress toward meeting individualized goals
- Productivity: Independent lessons completed each week

Course Grading: The final course grade is calculated as follows:

- Each marking period grade counts for 25% of the student's final course grade.

Additional remediation in grade-level or prerequisite standards and content will be provided when the teacher determines that a student has not yet mastered the necessary content. Enrichment opportunities will also be provided for students who demonstrate understanding more quickly than their peers.

Required and Supplementary Texts/Software

Zearn Math

- Sharma, S. (2025). *Zearn Math*. Zearn.

IXL Math

Calculator Recommendation

The secondary mathematics department of Central Bucks School District recognizes calculators as valuable tools for learning in the mathematics classroom. In certain advanced courses, graphing calculators with specific capabilities are important for daily classroom performance and are required for Advanced Placement assessments. While no specific brands are endorsed, there are restrictions on the types of calculators allowed on certain classroom assessments and final exams. Calculators that perform operations with variables, such as the TI-89, TI-92, and HP49G, are not permitted on district assessments or final exams, even though they may be allowed on some national assessments. Teachers have discretion regarding whether these calculator types may be used for classroom-related purposes.

Unit 1: Number Systems and Operations

Mission 2: Introducing Proportional Relationships

Mission 4: Proportional Relationships and Percent

Desired Results

Essential Questions:

- How can we recognize and represent proportional relationships in different ways (tables, graphs, equations, and contexts)?
- What does it mean for two quantities to have a constant relationship, and why does that matter?
- How can unit rate and proportional reasoning help us make predictions or solve real-world problems?
- How is percent a type of proportional relationship, and how can we use it to describe changes?
- Why can the same percent or ratio lead to different results depending on the situation?

Enduring Understandings:

Students will understand how to...

Mission 2, Topic A: Representing Proportional Relationships with Tables

- Lesson 1: One of These Things Is Not Like the Others
- Lesson 2: Introducing Proportional Relationships with a Table
- Lesson 3: More About Constant of Proportionality

Mission 2, Topic B: Representing Proportional Relationships with Equations

- Lesson 4: Proportional Relationships and Equations
- Lesson 6: Using Equations to Solve Problems

Mission 2, Topic C: Comparing Proportional and Nonproportional Relationships

- Lesson 7: Comparing Relationships with Tables
- Lesson 8: Comparing Relationships with Equations
- Lesson 9: Solving Problems about Proportional Relationships

Mission 2, Topic D: Representing Proportional Relationships with Graphs

- Lesson 10: Introducing Graphs of Proportional Relationships
- Lesson 11: Interpreting Graphs of Proportional Relationships
- Lesson 12: Using Graphs to Compare Relationships

Mission 2, Topic E: Let's Put it to Work

- Lesson 14: Four Representations

Mission 4, Topic B: Percent Increase and Decrease

- Lesson 6: Increasing and Decreasing
- Lesson 7: One Hundred Percent

Mission 4, Topic C: Applying Percents

- Lesson 10: Tax and Tip
- Lesson 11: Percentage Context
- Lesson 12: Find the Percentage
- Lesson 14: Percent Error

Knowledge:

Mission 2 Vocabulary

axes, column, constant, constant of proportionality, coordinate plane, coordinates, equation, equivalent ratios, is proportional to, origin, per, plot, proportional relationship, quantity, reciprocal, relate, row, situation, steady, surface area, value, volume, x-coordinate, y-coordinate

Mission 4 Vocabulary

(a fraction) less than, (a fraction) more than, commission, decimal representation, degrees Fahrenheit, distributive property, discount, final / new amount, initial / original amount, interest, long division, markdown, markup, measurement error, percentage, percentage decrease, percentage increase, percent error, repeating decimal, sales tax, tax rate, tape diagram, temperature, tip, unit rate

Skills:

Mission 2:

Topic A - Representing Proportional Relationships with Tables

- Lesson 1: Compare and create representations to compare ratios in the context of recipes or scaled copies.
- Lesson 2: Use a table to describe a proportional relationship, calculate the constant of proportionality, and find missing values.
- Lesson 3: Find the constant of proportionality from information given on a table and use the constant of proportionality to fill information on a table.

Topic B – Representing Proportional Relationships with Equations

- Lesson 4: Write equations to represent a proportional relationship described in a table.
- Lesson 6: Use tables and equations to solve problems involving proportional relationships.

Topic C – Comparing Proportional and Nonproportional Relationships

- Lesson 7: Use a table of values to determine if a relationship is proportional.
- Lesson 8: Recognize that proportional relationships are characterized by equations in the form $y = kx$.
- Lesson 9: Write an equation to represent a proportional relationship and solve problems about proportional relationships.

Topic D – Representing Proportional Relationships with Graphs

- Lesson 10: Generalize that the graph of a proportional relationship lies on a line through the origin.
- Lesson 11: Interpret points on the graph of a proportional relationship, and identify the constant of proportionality from the graph of a proportional relationship.
- Lesson 12: Interpret and compare two related proportional relationships on the same graph.

Topic E – Let's Put It To Work

- Lesson 14: Represent a proportional relationship in four different ways.

Mission 4:**Topic B – Percent Increase and Decrease**

- Lesson 6: Find percent increases and decreases when given an original amount.
- Lesson 7: Use double number lines to solve problems about percent increases and decreases.
- Lesson 8: Use equations to represent percent increases and decreases.
- Lesson 9: Find percentages of quantities that are not whole numbers.

Topic C – Applying Percentages

- Lesson 10: Understand and solve problems about sales tax.
- Lesson 11: Understand and solve problems about commission, markups, and discounts.

- Lesson 12: Understand and solve problems involving percentage increase and percentage decrease using real-world contexts such as tax, tip, and discount.
- Lesson 14: Solve and interpret problems that involve percent error by finding the correct amount, erroneous amount, or percent error.

Standards:

Previous Standards:

CC.2.1.6.D.1 – Understand ratio concepts and use ratio reasoning to solve problems

CC.2.2.6.B.1 – Apply and extend previous understandings of arithmetic to algebraic expressions

CC.2.3.6.A.1 – Apply appropriate tools to solve problems involving area, surface area, and volume

7th grade Core Standard:

CC.2.1.7.D.1 – Analyze proportional relationships and use them to model and solve real-world

CC.2.3.7.A.2 – Visualize and represent geometric figures and describe the relationships between them

CC.2.2.7.B.1 – Apply properties of operations to generate equivalent expressions

Acceptable Evidence

Assessments focus on the big ideas of mathematics and allow students to demonstrate their understanding across multiple modalities through a thoughtful balance of software- and paper-based experiences. All assessments are designed to fit into the classroom model and allocated time, and to enhance – rather than distract from – instruction.

Acceptable evidence:

Lesson Components:

- Warm-up
- Fluency
- Guided Practice
- Independent Practice
- Wrap-up

Formative/Summative Assessments:

- **Daily lesson – level assessments:** Lesson – level assessments are embedded into the curriculum and occur as part of recommended daily core instructional time, not in addition to it.
 - **The Tower of Power (Digital)**
 - The Tower of Power is a scaffolded assessment, administered automatically at the end of each Independent Digital Lesson. The Tower of Power is focused on the content of a single lesson and allows students to demonstrate their new understanding. If students make a mistake,

they receive real-time remediation at the point of misconception, allowing them to correct their understanding and continue through the assessment. Each Tower of Power contains two to four stages of problems that increase in complexity and decrease in scaffolding as students progress. The problems in each stage are carefully designed to focus on the big ideas of each lesson, mirroring the progression of learning students have just completed. Students must successfully complete 100% of the Tower of Power before moving on to their next Independent Digital Lesson. Since the Tower of Power is software-based, teachers can access a report that lets them know if a student is struggling with the daily digital assessment, allowing them to adjust instruction as needed.

- **Exit Ticket (Paper)**
 - The Exit Ticket is a paper assessment that is also focused on the content of a single lesson but is less scaffolded than the Tower of Power. The Exit Ticket is optional and can be administered after the completion of each Independent Digital Lesson, providing teachers with a second data point that they can use to monitor daily learning. The Exit Ticket determines if the student transferred their learning from the Independent Digital Lesson to a less scaffolded, open-response item that requires them to show their thinking and work by drawing models, writing explanations, or both. Since Exit Ticket problems are designed to highlight the big mathematical idea of each lesson, or a piece of it, we do not recommend editing them for content.
- **Mission – Level Assessments/Progress Monitoring:** Mission-level assessments with scoring guidance and detailed rubrics are used for consistency and fidelity of program management. Mid-Mission and End-of-Mission assessments are assessments administered roughly halfway through the Mission and at the conclusion of the Mission respectively.
 - Mid-Mission & End-of-Mission
 - Paper assessments consist of open-response items that require students to show their work or explain their thinking in a variety of ways, including drawing models and writing explanations, similar to an Exit Ticket. Some assessment items highlight a student's understanding of a big mathematical idea, while others focus on students' procedural fluency. Each part of any multi-step problem has a clear objective, is aligned with the explicit expectations of the target standards, and allows teachers to identify whether students are struggling with the foundational math concept or the multi-step aspect of the problem.
 - Optional Practice
 - Includes problems from current lessons along with a mix of topics from previous lessons.

Summative Assessment/Progress Checks:

- Progress Check #1
- Progress Check #2
- Mid-Mission Assessment: Topics A – C
- Progress Check #4
- End-of-Mission Assessment: Topics D – E
- Progress Check #6
- End-of-Mission Assessment: Topics B – D

Suggested Learning Experiences and Instruction

- Students will be able to explain how proportional relationships grow out of equivalent ratios learned in grade 6, including the use of scale factors and unit rates.
- Students will identify and interpret unit rates (per 1) and understand their role as the constant of proportionality in a relationship.
- Students will be able to represent proportional relationships using tables, equations of the form $y = kx$, and graphs that pass through the origin.
- Students should describe how the constant of proportionality determines the relationship between quantities and the steepness of a graph.
- Students will be able to apply proportional reasoning in real-world contexts such as constant speed, unit pricing, recipes, and measurement conversions.
- Students will determine whether a relationship is proportional and justify their reasoning using tables, unit rates, equations, or graphs.

Differentiation/Intervention/Enrichment Options:

- Students will benefit from predictable lesson structures (Warm-Up, Concept Exploration, Wrap-Up) that reduce cognitive load and allow them to focus on the math.
- Students will be supported through a progression from concrete to abstract learning, helping them build understanding using examples, visuals, and symbols over time.
- Students will have opportunities to think independently and then collaborate, allowing them to build confidence and deepen understanding with peer and teacher support.
- Students will be engaged through real-world contexts and applications, which make math meaningful and provide an entry point for diverse learners.
- Students will access content through multiple means (aligned with UDL principles), increasing accessibility for multilingual learners, students with disabilities, and those with unfinished learning.
- Students should receive structured supports and scaffolds embedded throughout lessons to ensure all learners can access and participate in mathematical thinking.

For Language Development:

- Students will benefit from explicit instruction and repeated exposure to key mathematical vocabulary, helping them build confidence in using academic language.
- Students will be supported through structured discussion routines (e.g., Think-Pair-Share) that include sentence frames and conversation starters to guide participation.
- Students will engage in meaningful math conversations where they explain their thinking, listen to others, and build on shared ideas.
- Students will be supported by the use of multiple languages when appropriate, allowing them to process mathematical ideas in their first language to deepen understanding.
- Students will access learning through visual supports, models, and teacher-created displays that capture and reinforce important language and concepts.
- Students should participate in structured language routines (such as clarifying responses, comparing strategies, and refining ideas) that strengthen both mathematical reasoning and language development.

For Learners Who Require Further Intervention:

- Students will be supported through built-in, just-in-time scaffolds within digital lessons that connect new learning to prior knowledge and address gaps as they arise.
- Students will receive adaptive support during lessons through visual and conceptual models that strengthen understanding of key mathematical ideas.
- Students will benefit from ongoing diagnostic tools (like the Tower of Power) that identify areas of struggle and provide immediate, targeted support (“Boosts”).
- Students should receive additional foundational lessons when needed, helping them build essential skills connected to grade-level content.
- Students will access learning through personalized assignments that allow them to move between grade-level work and targeted support seamlessly and without stigma.
- Students will benefit from teacher monitoring and data reports that guide instructional decisions and provide deeper interventions when necessary.

Unit 2: Rational Number Operations

Mission 5: Rational Number Arithmetic

Desired Results

Essential Questions:

- How do positive and negative numbers help us describe and model real-world situations (e.g., temperature, money, elevation, direction)?
- How can a number line help us understand and predict the results of addition and subtraction with rational numbers?
- How do operations with positive and negative numbers (addition, subtraction, multiplication, division) work, and why do they follow these patterns?
- How can we use multiplication and division to reason about relationships and solve real-world problems involving constant rates?
- How can we apply operations with rational numbers to evaluate expressions and solve problems?
- How can we represent and solve real-world situations using equations involving positive and negative numbers?

Enduring Understandings:

Students will understand how to...

Topic A: Interpreting Negative Numbers

- Lesson 1: Interpreting Negative Numbers

Topic B: Adding and Subtracting Rational Numbers

- Lesson 2: Changing Temperatures
- Lesson 3: Changing Elevation
- Lesson 4: Money & Debts
- Lesson 5: Representing Subtraction
- Lesson 6: Subtracting Rational Numbers
- Lesson 7: Adding and Subtracting to Solve Problems

Topic C: Multiplying and Dividing Rational Numbers

- Lesson 8: Position, Speed, and Direction
- Lesson 9: Multiplying and Dividing Rational Numbers
- Lesson 11: Dividing Rational Numbers

Topic D: Four Operations with Rational Numbers

- Lesson 13: Expressions with Rational Numbers
- Lesson 14: Solving Problems with Rational Numbers

Topic E: Solving Equations Where There are Negatives

- Lesson 15: Solving Equations with Rational Numbers
- Lesson 16: Representing Context with Equations

Knowledge:

Mission 5 Vocabulary

absolute value, account balance, additive inverse, debt, decrease, degrees Celsius, deposit, difference, distance, elevation, expression, factor, increase, multiplicative inverse, negative, number line, operation, opposite, rational number, sea level, signed numbers, solution (to an equation), sum, temperature, variable, velocity, vertical, withdrawal, x-coordinate, y-coordinate

Skills:

Topic A: Interpreting Negative Numbers

- Lesson 1: Interpret signed numbers in the context of temperature and elevation.

Topic B: Adding & Subtracting Rational Numbers

- Lesson 2: Use a number line to add positive and negative numbers.
- Lesson 3: Understand how to add positive and negative numbers in general.
- Lesson 4: Understand what positive and negative numbers mean in a situation involving money and calculate an account balance after a deposit or withdrawal.
- Lesson 5: Use a number line to subtract positive and negative numbers.
- Lesson 6: Solve subtraction expressions that have the same numbers in the opposite order, and explain the relationship between their differences.
- Lesson 7: Add and subtract signed numbers to represent gains and losses in different contexts.

Topic C: Multiplying and Dividing Rational Numbers

- Lesson 8: Understand that the product of a negative number and positive number is negative and explain how signed numbers can be used to represent position and speed.
- Lesson 9: Interpret signed numbers when used to represent time in situations about speed and direction as well as understand that the product of two negative numbers is positive.
- Lesson 11: Use the relationship between multiplication and division to develop the rules for dividing rational numbers.
- Lesson 12: Multiply and divide rational numbers to solve problems involving constant rates

Topic D: Four Operations with Rational Numbers

- Lesson 13: Use the relationship between addition and subtraction, and the relationship between multiplication and division, to evaluate expressions with all four operations on the rational numbers.

- Lesson 14: Interpret situations involving rational numbers, including positive and negative values, and use rational numbers to represent and solve problems.

Topic E: Solving Equations Where There are Negatives

- Lesson 15: Solve equations that involve negative numbers.
- Lesson 16: Write and solve equations to represent situations that involve negative numbers.

Standards:

Previous Standards:

CC.2.1.6.D.1 – Understand ratio concepts and use ratio reasoning to solve problems.

CC.2.1.6.E.1 – Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

CC.2.1.6.E.2 – Identify and choose appropriate processes to compute fluently with multi-digit numbers.

CC.2.1.6.E.3 – Develop and/or apply number theory concepts to find common factors and multiples.

CC.2.2.6.B.1 – Apply and extend previous understandings of arithmetic to algebraic expressions.

CC.2.2.6.B.2 – Understand the process of solving a one-variable equation or inequality and apply it to real-world and mathematical problems.

CC.2.2.6.B.3 – Represent and analyze quantitative relationships between dependent and independent variables.

7th grade Core Standard:

CC.2.1.7.E.1 – Apply and extend previous understandings of operations with fractions to operations with rational numbers

CC.2.2.7.B.1 – Apply properties of operations to generate equivalent expressions

CC.2.2.7.B.3 – Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations

CC.2.1.7.D.1 – Analyze proportional relationships and use them to model and solve real-world and mathematical problems

Acceptable Evidence

Assessments focus on the big ideas of mathematics and allow students to demonstrate their understanding across multiple modalities through a thoughtful balance of software- and paper-based experiences. All assessments are designed to fit into the classroom model and allocated time, and to enhance – rather than distract from – instruction.

Acceptable evidence:

Lesson Components:

- Warm-up

- Fluency
- Guided Practice
- Independent Practice
- Wrap-up

Formative/Summative Assessments:

- **Daily lesson – level assessments:** Lesson – level assessments are embedded into the curriculum and occur as part of recommended daily core instructional time, not in addition to it.
 - **The Tower of Power (Digital)**
 - The Tower of Power is a scaffolded assessment, administered automatically at the end of each Independent Digital Lesson. The Tower of Power is focused on the content of a single lesson and allows students to demonstrate their new understanding. If students make a mistake, they receive real-time remediation at the point of misconception, allowing them to correct their understanding and continue through the assessment. Each Tower of Power contains two to four stages of problems that increase in complexity and decrease in scaffolding as students progress. The problems in each stage are carefully designed to focus on the big ideas of each lesson, mirroring the progression of learning students have just completed. Students must successfully complete 100% of the Tower of Power before moving on to their next Independent Digital Lesson. Since the Tower of Power is software-based, teachers can access a report that lets them know if a student is struggling with the daily digital assessment, allowing them to adjust instruction as needed.
 - **Exit Ticket (Paper)**
 - The Exit Ticket is a paper assessment that is also focused on the content of a single lesson but is less scaffolded than the Tower of Power. The Exit Ticket is optional and can be administered after the completion of each Independent Digital Lesson, providing teachers with a second data point that they can use to monitor daily learning. The Exit Ticket determines if the student transferred their learning from the Independent Digital Lesson to a less scaffolded, open-response item that requires them to show their thinking and work by drawing models, writing explanations, or both. Since Exit Ticket problems are designed to highlight the big mathematical idea of each lesson, or a piece of it, we do not recommend editing them for content.
- **Mission – Level Assessments/Progress Monitoring:** Mission-level assessments with scoring guidance and detailed rubrics are used for consistency and fidelity of program management. Mid-Mission and End-of-Mission assessments are assessments

administered roughly halfway through the Mission and at the conclusion of the Mission respectively.

- Mid-Mission & End-of-Mission
 - Paper assessments consist of open-response items that require students to show their work or explain their thinking in a variety of ways, including drawing models and writing explanations, similar to an Exit Ticket. Some assessment items highlight a student's understanding of a big mathematical idea, while others focus on students' procedural fluency. Each part of any multi-step problem has a clear objective, is aligned with the explicit expectations of the target standards, and allows teachers to identify whether students are struggling with the foundational math concept or the multi-step aspect of the problem.
- Optional Practice
 - Includes problems from current lessons along with a mix of topics from previous lessons.

Summative Assessment/Progress Checks:

- Progress Check #1
- Mid-Mission Assessment: Topics A – B Progress Check #2
- Progress Check #3
- Progress Check #4
- End of Mission Assessment: Topics C – E Progress Check #5

Suggested Learning Experiences and Instruction

- Students will be able to extend the operations of addition, subtraction, multiplication, and division from fractions to all rational numbers, written as decimals or in the form $\frac{a}{b}$.
- Students will be able to determine how signed numbers are used to represent quantities such as measurements of temperature and elevation, opposites (pairs of numbers on the number line that are the same distance from zero), and absolute value.
- Students will be able to extend addition and subtraction from fractions to all rational numbers.
- Students will be able to use multiplication and division to solve problems about position, direction, constant speed, and constant velocity in which students represent quantities with number line diagrams and tables of numerical expressions with signed numbers.
- Students will be able to work with expressions that use the four operations on rational numbers, making use of structure, e.g., to see without calculating that the product of two factors is positive because the values of the factors are both negative.
- Students will be able to begin working with linear equations in one variable that have rational number coefficients.

Differentiation/Intervention/Enrichment Options:

Students will benefit from predictable lesson structures and a progression from concrete to abstract learning that supports sense-making and reduces cognitive load.

- Students will engage in both independent thinking and collaboration, building confidence and deepening understanding with peer and teacher support.
- Students will access content through real-world contexts and multiple modalities (aligned to UDL), ensuring meaningful and accessible entry points for diverse learners.
- Students will be supported with embedded scaffolds and structured tools (e.g., guided notes, graphic organizers, checklists) to promote access, participation, and independence.
- Students will utilize accessible design features and assistive technologies (e.g., clear visuals, text-to-speech) to support understanding and engagement.
- Students will learn in flexible, supportive environments with opportunities to use manipulatives, adjust pacing, and revisit content as needed.

For Language Development:

Students will benefit from explicit instruction and repeated exposure to key mathematical vocabulary, helping them build confidence in using academic language.

- Students will be supported through structured discussion routines (e.g., Think-Pair-Share) that include sentence frames and conversation starters to guide participation.
- Students will engage in meaningful math conversations where they explain their thinking, listen to others, and build on shared ideas.
- Students will be supported by the use of multiple languages when appropriate, allowing them to process mathematical ideas in their first language to deepen understanding.
- Students will access learning through visual supports, models, and teacher-created displays that capture and reinforce important language and concepts.
- Students should participate in structured language routines (such as clarifying responses, comparing strategies, and refining ideas) that strengthen both mathematical reasoning and language development.

For Learners Who Require further intervention:

Students will be supported through built-in, just-in-time scaffolds within digital lessons that connect new learning to prior knowledge and address gaps as they arise.

- Students will receive adaptive support during lessons through visual and conceptual models that strengthen understanding of key mathematical ideas.
- Students will benefit from ongoing diagnostic tools (like the Tower of Power) that identify areas of struggle and provide immediate, targeted support (“Boosts”).

- Students should receive additional foundational lessons when needed, helping them build essential skills connected to grade-level content.
- Students will access learning through personalized assignments that allow them to move between grade-level work and targeted support seamlessly and without stigma.
- Students will benefit from teacher monitoring and data reports that guide instructional decisions and provide deeper interventions when necessary.

Unit 3: Model with Expressions, Equations, and Inequalities; Angle Relationships

Mission 6: Expressions, Equations, and Inequalities

Mission 7: Angles, Triangles and Prisms (Topics A & B)

Desired Results

Essential Questions:

- How can we represent real-world situations using equations, inequalities, and diagrams?
- What strategies can we use to solve equations and inequalities, and how do we know if our solutions make sense?
- How are visual models (like tape diagrams and hanger diagrams) helpful for understanding and solving algebraic problems?
- What does it mean for two expressions or equations to be equivalent, and why is that important in problem solving?
- What information is needed to determine if a triangle is unique, and why does that matter?
- How can angle relationships (like complementary, supplementary, and vertical angles) help us solve for unknown measures?
- How do 3D shapes change when sliced, and what can cross-sections tell us about their structure?
- How are area, surface area, and volume formulas useful for solving real-world problems involving three-dimensional shapes?

Enduring Understandings:

Students will understand how to...

Mission 6, Topic D: Writing Equivalent Expressions

- Lesson 18: Subtraction in Equivalent Expressions
- Lesson 19: Expanding and Factoring
- Lesson 20: Combining Like Terms (Part 1)
- Lesson 21: Combining Like Terms (Part 2)
- Lesson 22: Combining Like Terms (Part 3)

Mission 6, Topic A: Representing Situations of the Form $px + q = r$ and $p(x + q) = r$

- Lesson 1: Relationships between Quantities
- Lesson 2: Reasoning about Contexts with Tape Diagrams (Part 1)
- Lesson 3: Reasoning about Contexts with Tape Diagrams (Part 2)
- Lesson 4: Reasoning about Equations and Tape Diagrams (Part 1)

- Lesson 5: Reasoning about equations and Tape Diagrams (Part 2)
- Lesson 6: Distinguishing between Two Types of Situations

Mission 6, Topic B: Solving Equations of the Form $px + q = r$ and $p(x + q) = r$ and Problems That Lead to Those Equations

- Lesson 7: Reasoning about Solving Equations (Part 1)
- Lesson 8: Reasoning about Solving Equations (Part 2)
- Lesson 9: Dealing with Negative Numbers
- Lesson 10: Different Options for Solving One Equation
- Lesson 11: Using Tape Diagrams and Equations to Solve Problems

Mission 7, Topic A: Angle Relationships

- Lesson 1: Relationships of Angles
- Lesson 2: Adjacent Angles
- Lesson 3: Nonadjacent Angles
- Lesson 4: Solving for Unknown Angles
- Lesson 5: Using Equations to Solve for Unknown Angles

Mission 7, Topic B: Drawing Polygons with Given Conditions

- Lesson 6: Building Polygons (Part 1)
- Lesson 7: Building Polygons (Part 2)
- Lesson 8: Triangles with Three Common Measures

Mission 6, Topic C: Inequalities

- Lesson 13: Reintroducing Inequalities
- Lesson 14: Finding Solutions to Inequalities in Context
- Lesson 15: Efficiently Solving Inequalities
- Lesson 16: Inequalities in Context
- Lesson 17: Modeling with Inequalities

Knowledge:

Mission 6 Vocabulary

associative property, balanced hanger, boundary, combine like terms, commutative (property), direction (of an inequality), distribute, each side (of an equation), equivalent expression, expand (an expression), factor (an expression), greater than, greater than or equal to, inequality, less than, less than or equal to, open / closed circle, operation, relationship, solution to an inequality, solve, substitute, term, unknown amount, variable

Mission 7 Vocabulary

adjacent angles, angle measure, associative property, balanced hanger, base (of a prism or pyramid), boundary, combine like terms, commutative (property), compass, complementary, condition, cross section, degree, degrees, different triangle, direction (of an inequality), distribute, each side (of an equation), equivalent expression, expand (an expression), face, factor (an expression), greater than, greater than or equal to, identical copy, inequality, intersect, less than, less than or equal to, measurement error, open / closed circle, operation, parallel, perpendicular, perimeter, prism, protractor, pyramid, quadrilateral, relationship, right angle, segment, side length, solution to an inequality, solve, straight angle, substitute, supplementary, surface area, term, unknown amount, unique triangle, variable, vertex (of a pyramid), vertex (of an angle), vertical angles, volume

Skills:

Mission 6, Topic D: Writing Equivalent Expressions

- Lesson 18: Extend the distributive property to expressions with negative coefficients.
- Lesson 19: Use the distributive property to find equivalent expressions by expanding or factoring.
- Lesson 20: Given an expression, write an equivalent expression with fewer terms using properties of operations, and explain why the expressions are equivalent.
- Lesson 21: Write expressions with fewer terms that are equivalent to a given expression that includes negative coefficients and parentheses.
- Lesson 22: Write equivalent expressions with fewer terms by combining like terms.

Mission 6, Topic A: Representing Situations of the Form $px + q = r$ and $p(x + q) = r$

- Lesson 1: Find unknown values in relationships, and interpret them as proportional and not proportional.
- Lesson 2: Interpret tape diagrams that represent word problems, and use them to find unknown values.
- Lesson 3: Write and match equations and tape diagrams that represent the same situation.
- Lesson 4: Coordinate tape diagrams, equations of the form $px + q = r$, and verbal descriptions of the situations, and reason about and interpret a solution.
- Lesson 5: Coordinate tape diagrams, equations of the form $p(x + q) = r$, and verbal descriptions of the situations, and reason about and interpret a solution.
- Lesson 6: Write and categorize equations of the forms $px + q = r$ and $p(x + q) = r$ from situations and tape diagrams.

Mission 6, Topic B: Solving Equations of the Form $px + q = r$ and $p(x + q) = r$ and Problems That Lead to Those Equations

- Lesson 7: Use a balanced hanger diagram to reason about writing and solving equations in the form $px + q = r$.

- Lesson 8: Use a balanced hanger diagram to reason about writing and solving equations in the form $p(x + q) = r$.
- Lesson 9: Solve equations of the form $px + q = r$ and $p(x + q) = r$ that involve negative numbers.
- Lesson 10: Decide between and use two common approaches for solving an equation of the form $p(x + q) = r$: expanding using the distributive property, or dividing each side by p .
- Lesson 11: Use tape diagrams to translate verbal descriptions for situations into an equation of the form $px + q = r$ or $p(x + q) = r$, and solve the resulting equation to determine an unknown quantity in the situation.

Mission 7, Topic A: Angle Relationships

- Lesson 1: Find unknown angle measures by reasoning about adjacent angles with known measures.
- Lesson 2: Find unknown angle measures by reasoning about complementary or supplementary angles.
- Lesson 3: Find unknown angle measures by reasoning about vertical angles, and nonadjacent complementary or supplementary angles.
- Lesson 4: Solve multi-step problems involving complementary, supplementary, and vertical angles, and explain the reasoning.
- Lesson 5: Solve an equation that represents a relationship between angle measures, and explain the reasoning.

Mission 7, Topic B: Drawing Polygons with Given Conditions

- Lesson 6: Recognize that four side lengths do not determine a unique quadrilateral, but that three side lengths can determine a unique triangle.
- Lesson 7: Show that there is a minimum and maximum length the third side of a triangle could be, given the other two side lengths.
- Lesson 8: Compare and contrast triangles that share three common measures of angles or sides, and determine whether they are identical copies or different triangles.

Mission 6, Topic C: Inequalities

- Lesson 13: Write inequality statements to represent inequality situations, and use substitution to determine whether a given value for a variable makes an inequality true.
- Lesson 14: Write inequalities that represent situations, and use substitution or reasoning about the context to find the solution.
- Lesson 15: Solve inequalities using the associated equation and testing values to determine the direction of the inequality in the solution.
- Lesson 16: Match an inequality to a situation it represents, explain what the parts of the inequality mean, solve it, and then interpret what the solution means in the situation.
- Lesson 17: Write and solve an inequality to solve real-world problems and critique the solution to an inequality.

Standards:

Previous Standards:

- CC.2.1.6.E.2 – Identify and choose appropriate processes to compute fluently with multi-digit numbers
- CC.2.1.6.E.3 – Develop and/or apply number theory concepts to find common factors and multiples
- CC.2.2.6.B.1 – Apply and extend previous understandings of arithmetic to algebraic expressions
- CC.2.2.6.B.2 – Understand the process of solving one-variable equations and inequalities (and apply it to real-world and mathematical problems)
- CC.2.2.6.B.3 – Represent and analyze relationships between dependent and independent variables
- CC.2.3.6.A.1 – Apply appropriate tools to solve problems involving area, surface area, and volume

Core Standards:

- CC.2.2.7.B.1 – Apply properties of operations to generate equivalent expressions
- CC.2.2.7.B.3 – Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations
- CC.2.3.7.A.1 – Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume
- CC.2.3.7.A.2 – Visualize and represent geometric figures and describe the relationships between them

Acceptable Evidence

Assessments focus on the big ideas of mathematics and allow students to demonstrate their understanding across multiple modalities through a thoughtful balance of software- and paper-based experiences. All assessments are designed to fit into the classroom model and allocated time, and to enhance – rather than distract from – instruction.

Acceptable evidence:

Lesson Components:

- Warm-up
- Fluency
- Guided Practice
- Independent Practice
- Wrap-up

Formative/Summative Assessments:

- **Daily lesson – level assessments:** Lesson – level assessments are embedded into the curriculum and occur as part of recommended daily core instructional time, not in addition to it.

- **The Tower of Power (Digital)**
 - The Tower of Power is a scaffolded assessment, administered automatically at the end of each Independent Digital Lesson. The Tower of Power is focused on the content of a single lesson and allows students to demonstrate their new understanding. If students make a mistake, they receive real-time remediation at the point of misconception, allowing them to correct their understanding and continue through the assessment. Each Tower of Power contains two to four stages of problems that increase in complexity and decrease in scaffolding as students progress. The problems in each stage are carefully designed to focus on the big ideas of each lesson, mirroring the progression of learning students have just completed. Students must successfully complete 100% of the Tower of Power before moving on to their next Independent Digital Lesson. Since the Tower of Power is software-based, teachers can access a report that lets them know if a student is struggling with the daily digital assessment, allowing them to adjust instruction as needed.
- **Exit Ticket (Paper)**
 - The Exit Ticket is a paper assessment that is also focused on the content of a single lesson but is less scaffolded than the Tower of Power. The Exit Ticket is optional and can be administered after the completion of each Independent Digital Lesson, providing teachers with a second data point that they can use to monitor daily learning. The Exit Ticket determines if the student transferred their learning from the Independent Digital Lesson to a less scaffolded, open-response item that requires them to show their thinking and work by drawing models, writing explanations, or both. Since Exit Ticket problems are designed to highlight the big mathematical idea of each lesson, or a piece of it, we do not recommend editing them for content.
- **Mission – Level Assessments/Progress Monitoring:** Mission-level assessments with scoring guidance and detailed rubrics are used for consistency and fidelity of program management. Mid-Mission and End-of-Mission assessments are assessments administered roughly halfway through the Mission and at the conclusion of the Mission respectively.
 - **Mid-Mission & End-of-Mission**
 - Paper assessments consist of open-response items that require students to show their work or explain their thinking in a variety of ways, including drawing models and writing explanations, similar to an Exit Ticket. Some assessment items highlight a student's understanding of a big mathematical idea, while others focus on students' procedural fluency. Each part of any multi-step problem has a clear objective, is aligned with the explicit expectations of the target standards, and allows teachers to

identify whether students are struggling with the foundational math concept or the multi-step aspect of the problem.

- Optional Practice
 - Includes problems from current lessons along with a mix of topics from previous lessons.

Summative Assessment/Progress Checks:

Unit 3:

- Progress Check #1
- Progress Check #2
- Progress Check #3
- Mid-Mission Assessment: Topics A-B – Progress Check #4

Cont., Unit 3:

- Progress Check #1
- Mid- Mission Assessment: Topics A – B- Progress Check #2
- End of Mission Assessment: Topics C Progress Check #5

Suggested Learning Experiences and Instruction

- Students will represent and interpret relationships between quantities using tape diagrams, equations, and inequalities, and explain how the representations connect.
- Students will write, solve, and interpret equations of the forms $px + q = r$ and $p(x + q) = r$, including in real-world contexts.
- Students will use visual models (tape diagrams, hanger diagrams, and area models) and properties of operations to justify strategies for solving equations and creating equivalent expressions.
- Students will analyze and solve inequalities, represent solutions on a number line, and interpret what solutions mean in context.
- Students will generate and explain equivalent expressions using the distributive property and combining like terms.
- Students will investigate how angle and side measurements determine triangles and reason about whether a triangle is unique, impossible, or has multiple solutions.
- Students will apply angle relationships (complementary, supplementary, vertical) and equations to find unknown angle measures and justify their reasoning.
- Students will analyze three-dimensional figures, including cross-sections, and solve real-world problems involving area, surface area, and volume using appropriate tools.

Differentiation/Intervention/Enrichment Options:

- Students will benefit from predictable lesson structures and a progression from concrete to abstract learning that supports sense-making and reduces cognitive load.

- Students will engage in both independent thinking and collaboration, building confidence and deepening understanding with peer and teacher support.
- Students will access content through real-world contexts and multiple modalities (aligned to UDL), ensuring meaningful and accessible entry points for diverse learners.
- Students will be supported with embedded scaffolds and structured tools (e.g., guided notes, graphic organizers, checklists) to promote access, participation, and independence.
- Students will utilize accessible design features and assistive technologies (e.g., clear visuals, text-to-speech) to support understanding and engagement.
- Students will learn in flexible, supportive environments with opportunities to use manipulatives, adjust pacing, and revisit content as needed.

For Language Development:

- Students will benefit from explicit instruction and repeated exposure to key mathematical vocabulary, helping them build confidence in using academic language.
- Students will be supported through structured discussion routines (e.g., Think-Pair-Share) that include sentence frames and conversation starters to guide participation.
- Students will engage in meaningful math conversations where they explain their thinking, listen to others, and build on shared ideas.
- Students will be supported by the use of multiple languages when appropriate, allowing them to process mathematical ideas in their first language to deepen understanding.
- Students will access learning through visual supports, models, and teacher-created displays that capture and reinforce important language and concepts.
- Students should participate in structured language routines (such as clarifying responses, comparing strategies, and refining ideas) that strengthen both mathematical reasoning and language development.

For Learners Who Require further intervention:

- Students will be supported through built-in, just-in-time scaffolds within digital lessons that connect new learning to prior knowledge and address gaps as they arise.
- Students will receive adaptive support during lessons through visual and conceptual models that strengthen understanding of key mathematical ideas.
- Students will benefit from ongoing diagnostic tools (like the Tower of Power) that identify areas of struggle and provide immediate, targeted support (“Boosts”).
- Students should receive additional foundational lessons when needed, helping them build essential skills connected to grade-level content.
- Students will access learning through personalized assignments that allow them to move between grade-level work and targeted support seamlessly and without stigma.
- Students will benefit from teacher monitoring and data reports that guide instructional decisions and provide deeper interventions when necessary.

Unit 4: Geometry

Mission 3: Measuring Circles

Mission 7: Angles, Triangles and Prisms (Topic C)

Desired Results

Essential Questions:

- What defines a circle, and how are radius, diameter, circumference, and area related?
- Why is the circumference of a circle proportional to its diameter, and what role does π play?
- How can we use formulas to solve real-world problems involving circles, including area and circumference?
- What information is needed to determine whether a triangle is unique, impossible, or has multiple solutions?
- How do angle relationships (complementary, supplementary, and vertical) help us find unknown measures?
- How can cross-sections help us understand the structure of three-dimensional shapes?
- How are area, surface area, and volume used to solve real-world problems involving 3D figures?
- How do tools (such as rulers, protractors, and models) support accuracy and reasoning in geometric problem solving?

Enduring Understandings:

Students will understand how to...

Mission 3, Topic A: Circumference of a Circle

- Lesson 1: How well can you measure?
- Lesson 2: Exploring Circles
- Lesson 3: Exploring Circumference
- Lesson 4: Applying Circumference
- Lesson 5: Circumference & Wheels

Mission 3, Topic B: Area of a Circle

- Lesson 6: Estimating Areas
- Lesson 7: Exploring the Area of a Circle
- Lesson 8: Relating Area to Circumference
- Lesson 9: Applying Area of Circles

Mission 3, Topic C: Let's Put it to Work

- Lesson 10: Distinguishing Circumference and Area
- Lesson 11: Stained-Glass Windows (optional)

Mission 7, Topic C: Solid Geometry

- Lesson 11: Slicing Solids
- Lesson 12: Volume of Right Prisms
- Lesson 13: Decomposing Bases for Area
- Lesson 14: Surface Area of Right Prisms
- Lesson 15: Distinguishing Volume and Surface Area
- Lesson 16: Applying Volume and Surface Area

Knowledge:

Mission 3 Vocabulary

area of a circle, approximate, approximation, area of a circle, center (of a circle), circle, circumference, design, diameter, formula, half-circle, perimeter, pi, radius, relationship, rotation, squared, travel

Mission 7 Vocabulary

adjacent angles, angle measure, associative property, balanced hanger, base (of a prism or pyramid), boundary, combine like terms, commutative (property), compass, complementary, condition, cross section, degree, degrees, different triangle, direction (of an inequality), distribute, each side (of an equation), equivalent expression, expand (an expression), face, factor (an expression), greater than, greater than or equal to, identical copy, inequality, intersect, less than, less than or equal to, measurement error, open / closed circle, operation, parallel, perpendicular, perimeter, prism, protractor, pyramid, quadrilateral, relationship, right angle, segment, side length, solution to an inequality, solve, straight angle, substitute, supplementary, surface area, term, unknown amount, unique triangle, variable, vertex (of a pyramid), vertex (of an angle), vertical angles, volume

Skills:

Mission 3, Topic A: Circumference of a Circle

- Lesson 1: Examine quotients and use a graph to decide whether two associated quantities are in a proportional relationship.
- Lesson 2: Describe characteristics that make a shape a circle and identify the diameter, radius, and center of a circle.
- Lesson 3: Explore the relationship between the diameter and circumference of circles.
- Lesson 4: Apply an understanding of circumference to find the distance around a shape.
- Lesson 5: Use the radius or diameter of a wheel to find the distance the wheel travels in any number of complete rotations.

Mission 3, Topic B: Area of a Circle

- Lesson 6: Calculate and estimate the area of irregular polygons.
- Lesson 7: Estimate the area of a circle using the area of a square with the same side length as the radius.
- Lesson 8: Explain how the area of a circle and its circumference are related, and use the formula for the area of a circle.
- Lesson 9: Calculate the area of more complicated shapes that include fractions of circles.

Mission 3, Topic C: Let's Put it to Work

- Lesson 10: Decide whether the circumference or area of a circle is most useful in solving a problem and use formulas for area and circumference to solve problems relating to real-world situations.
- Lesson 11: Apply understanding of area and circumference of circles to solve design problems

Mission 7, Topic C: Solid Geometry

- Lesson 11: Describe, compare, and contrast (orally and in writing) different cross sections that could result from slicing the same pyramid or prism.
- Lesson 12: Find the volume of a right prism, and explain why the volume of a prism can be found by multiplying the area of the base by the height of the prism.
- Lesson 13: Find the volume of prisms with non-rectangular bases by decomposing the base into rectangles and triangles.

Standards:

Previous Standards:

CC.2.2.6.B.1 – Apply and extend previous understandings of arithmetic to algebraic expressions

CC.2.2.6.B.2 – Understand the process of solving one-variable equations and inequalities and apply it to real-world and mathematical problems

CC.2.2.6.B.3 – Represent and analyze quantitative relationships between dependent and independent variables

CC.2.1.6.E.2 – Identify and choose appropriate processes to compute fluently with multi-digit numbers

CC.2.1.6.E.3 – Develop and/or apply number theory concepts to find common factors and multiples

CC.2.3.6.A.1 – Apply appropriate tools to solve problems involving area, surface area, and volume

7th grade Core Standard:

CC.2.2.7.B.1 – Apply properties of operations to generate equivalent expressions

CC.2.2.7.B.3 – Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations

CC.2.3.7.A.1 – Solve real-world and mathematical problems involving angle measure, area, surface area, circumference, and volume

CC.2.3.7.A.2 – Visualize and represent geometric figures and describe the relationships between them

Acceptable Evidence

Assessments focus on the big ideas of mathematics and allow students to demonstrate their understanding across multiple modalities through a thoughtful balance of software- and paper-based experiences. All assessments are designed to fit into the classroom model and allocated time, and to enhance – rather than distract from – instruction.

Acceptable evidence:

Lesson Components:

- Warm-up
- Fluency
- Guided Practice
- Independent Practice
- Wrap-up

Formative/Summative Assessments:

- **Daily lesson – level assessments:** Lesson – level assessments are embedded into the curriculum and occur as part of recommended daily core instructional time, not in addition to it.
 - **The Tower of Power (Digital)**
 - The Tower of Power is a scaffolded assessment, administered automatically at the end of each Independent Digital Lesson. The Tower of Power is focused on the content of a single lesson and allows students to demonstrate their new understanding. If students make a mistake, they receive real-time remediation at the point of misconception, allowing them to correct their understanding and continue through the assessment. Each Tower of Power contains two to four stages of problems that increase in complexity and decrease in scaffolding as students progress. The problems in each stage are carefully designed to focus on the big ideas of each lesson, mirroring the progression of learning students have just completed. Students must successfully complete 100% of the Tower of Power before moving on to their next Independent Digital Lesson. Since the Tower of Power is software-based, teachers can access a report that lets them know if a student is struggling with the daily digital assessment, allowing them to adjust instruction as needed.
 - **Exit Ticket (Paper)**

- The Exit Ticket is a paper assessment that is also focused on the content of a single lesson but is less scaffolded than the Tower of Power. The Exit Ticket is optional and can be administered after the completion of each Independent Digital Lesson, providing teachers with a second data point that they can use to monitor daily learning. The Exit Ticket determines if the student transferred their learning from the Independent Digital Lesson to a less scaffolded, open-response item that requires them to show their thinking and work by drawing models, writing explanations, or both. Since Exit Ticket problems are designed to highlight the big mathematical idea of each lesson, or a piece of it, we do not recommend editing them for content.
- **Mission – Level Assessments/Progress Monitoring:** Mission-level assessments with scoring guidance and detailed rubrics are used for consistency and fidelity of program management. Mid-Mission and End-of-Mission assessments are assessments administered roughly halfway through the Mission and at the conclusion of the Mission respectively.
 - Mid-Mission & End-of-Mission
 - Paper assessments consist of open-response items that require students to show their work or explain their thinking in a variety of ways, including drawing models and writing explanations, similar to an Exit Ticket. Some assessment items highlight a student’s understanding of a big mathematical idea, while others focus on students’ procedural fluency. Each part of any multi-step problem has a clear objective, is aligned with the explicit expectations of the target standards, and allows teachers to identify whether students are struggling with the foundational math concept or the multi-step aspect of the problem.
 - Optional Practice
 - Includes problems from current lessons along with a mix of topics from previous lessons.

Summative Assessment/Progress Checks:

Unit 4:

- Progress Check #1
- Progress Check #2
- End – of – Mission Assessment – Topics A – C - Progress Check #3
- Progress Check #4
- End – of – Mission Assessment – Topics C - Progress Check #5

Suggested Learning Experiences and Instruction

- Students will define a circle as a set of points equidistant from a center and identify and use radius, diameter, and circumference in context.

- Students will explain and apply the proportional relationship between the circumference and diameter of a circle, including the role of π .
- Students will model and solve problems involving the area and circumference of circles, expressing answers in terms of π or using reasonable approximations.
- Students will investigate how side lengths and angle measures determine triangles and reason about whether a triangle is unique, impossible, or has multiple solutions.
- Students will apply angle relationships (complementary, supplementary, vertical) and use equations to solve for unknown angle measures.
- Students will analyze cross-sections of three-dimensional figures and describe how slicing affects the shape and structure of prisms and pyramids.
- Students will solve real-world problems involving area, surface area, and volume, and use appropriate tools (e.g., rulers, protractors) to support their reasoning.

Differentiation/Intervention/Enrichment Options:

- Students will benefit from predictable lesson structures and a progression from concrete to abstract learning that supports sense-making and reduces cognitive load.
- Students will engage in both independent thinking and collaboration, building confidence and deepening understanding with peer and teacher support.
- Students will access content through real-world contexts and multiple modalities (aligned to UDL), ensuring meaningful and accessible entry points for diverse learners.
- Students will be supported with embedded scaffolds and structured tools (e.g., guided notes, graphic organizers, checklists) to promote access, participation, and independence.
- Students will utilize accessible design features and assistive technologies (e.g., clear visuals, text-to-speech) to support understanding and engagement.
- Students will learn in flexible, supportive environments with opportunities to use manipulatives, adjust pacing, and revisit content as needed.

For Language Development:

- Students will benefit from explicit instruction and repeated exposure to key mathematical vocabulary, helping them build confidence in using academic language.
- Students will be supported through structured discussion routines (e.g., Think-Pair-Share) that include sentence frames and conversation starters to guide participation.
- Students will engage in meaningful math conversations where they explain their thinking, listen to others, and build on shared ideas.
- Students will be supported by the use of multiple languages when appropriate, allowing them to process mathematical ideas in their first language to deepen understanding.
- Students will access learning through visual supports, models, and teacher-created displays that capture and reinforce important language and concepts.

- Students should participate in structured language routines (such as clarifying responses, comparing strategies, and refining ideas) that strengthen both mathematical reasoning and language development.

For Learners Who Require further intervention:

- Students will be supported through built-in, just-in-time scaffolds within digital lessons that connect new learning to prior knowledge and address gaps as they arise.
- Students will receive adaptive support during lessons through visual and conceptual models that strengthen understanding of key mathematical ideas.
- Students will benefit from ongoing diagnostic tools (like the Tower of Power) that identify areas of struggle and provide immediate, targeted support (“Boosts”).
- Students should receive additional foundational lessons when needed, helping them build essential skills connected to grade-level content.
- Students will access learning through personalized assignments that allow them to move between grade-level work and targeted support seamlessly and without stigma.
- Students will benefit from teacher monitoring and data reports that guide instructional decisions and provide deeper interventions when necessary.

Unit 5: Sampling & Data Analysis

Mission 8: Probability & Sampling

Desired Results

Essential Questions:

- How can we describe and analyze the possible outcomes of a chance experiment?
- How can we organize sample spaces (lists, tables, tree diagrams) to better understand possible outcomes?
- How does the long-run frequency of outcomes relate to probability?
- What makes a sample representative of a population, and why does that matter?
- How can different sampling methods lead to overrepresentation or underrepresentation of groups?
- How can we use samples to make comparisons and draw conclusions about populations?

Enduring Understandings:

Students will understand how to...

Mission 8, Topic C: Sampling

- Lesson 11: Comparing Groups
- Lesson 12: Larger Populations
- Lesson 13: What makes a good sample?
- Lesson 14: Sampling in a fair way

Mission 8, Topic D: Using Samples

- Lesson 15: Estimating Population Measures of Center
- Lesson 16: Estimating Population Proportions
- Lesson 18: Comparing Populations Using Samples

Knowledge:

Mission 8 Vocabulary

certain, center (of a distribution), chance experiment, distribution, equally likely as not, event, impossible, interquartile range (IQR), less likely, likely, mean, mean absolute deviation (MAD), measure of center, measure of variability, median, mode, more likely, outcome, overlap,

population, probability, proportion, random, random sample, representative sample, sample, sample space, simulation, spread, survey, symmetric, tree (diagram), unlikely

Skills:

Mission 8, Topic C: Sampling

- Lesson 11: Justify whether two populations are “very different” based on the difference in their means expressed as a multiple of the mean absolute deviation.
- Lesson 12: Understand what a population is, what a sample is, and why a sample might be used, and describe a sample for a given population.
- Lesson 13: Given dot plots, determine whether a sample is representative of the population and explain the reasoning.
- Lesson 14: Recognize that random sampling tends to produce representative samples and support valid inferences.

Mission 8, Topic D: Using Samples

- Lesson 15: Use the mean and MAD of a sample to make inferences about the population, and explain the reasoning.
- Lesson 16: Use proportions from a random sample to make inferences about the population.
- Lesson 18: Apply reasoning about center and spread to determine whether two populations are likely to be meaningfully different.

Standards:

Previous Standards:

CC.2.4.6.B.1 – Develop an understanding of statistical variability by collecting, organizing, displaying, and analyzing data

CC.2.1.6.E.2 – Identify and choose appropriate processes to compute fluently with multi-digit numbers

CC.2.2.6.B.3 – Represent and analyze quantitative relationships between dependent and independent variables

7th grade Core Standard:

CC.2.4.7.B.1 – Draw inferences about populations based on random sampling concepts

CC.2.4.7.B.2 – Draw informal comparative inferences about two populations

Acceptable Evidence

Assessments focus on the big ideas of mathematics and allow students to demonstrate their understanding across multiple modalities through a thoughtful balance of software- and paper-based experiences. All assessments are designed to fit into the classroom model and allocated time, and to enhance – rather than distract from – instruction.

Acceptable evidence:

Lesson Components:

- Warm-up
- Fluency
- Guided Practice
- Independent Practice
- Wrap-up

Formative/Summative Assessments:

- **Daily lesson – level assessments:** Lesson – level assessments are embedded into the curriculum and occur as part of recommended daily core instructional time, not in addition to it.
 - **The Tower of Power (Digital)**
 - The Tower of Power is a scaffolded assessment, administered automatically at the end of each Independent Digital Lesson. The Tower of Power is focused on the content of a single lesson and allows students to demonstrate their new understanding. If students make a mistake, they receive real-time remediation at the point of misconception, allowing them to correct their understanding and continue through the assessment. Each Tower of Power contains two to four stages of problems that increase in complexity and decrease in scaffolding as students progress. The problems in each stage are carefully designed to focus on the big ideas of each lesson, mirroring the progression of learning students have just completed. Students must successfully complete 100% of the Tower of Power before moving on to their next Independent Digital Lesson. Since the Tower of Power is software-based, teachers can access a report that lets them know if a student is struggling with the daily digital assessment, allowing them to adjust instruction as needed.
 - **Exit Ticket (Paper)**
 - The Exit Ticket is a paper assessment that is also focused on the content of a single lesson but is less scaffolded than the Tower of Power. The Exit Ticket is optional and can be administered after the completion of each Independent Digital Lesson, providing teachers with a second data point that they can use to monitor daily learning. The Exit Ticket determines if the student transferred their learning from the Independent Digital Lesson to a less scaffolded, open-response item that requires them to show their thinking and work by drawing models, writing explanations, or both. Since Exit Ticket problems are designed to highlight the big mathematical idea of each lesson, or a piece of it, we do not recommend editing them for content.

- **Mission – Level Assessments/Progress Monitoring:** Mission-level assessments with scoring guidance and detailed rubrics are used for consistency and fidelity of program management. Mid-Mission and End-of-Mission assessments are assessments administered roughly halfway through the Mission and at the conclusion of the Mission respectively.
 - Mid-Mission & End-of-Mission
 - Paper assessments consist of open-response items that require students to show their work or explain their thinking in a variety of ways, including drawing models and writing explanations, similar to an Exit Ticket. Some assessment items highlight a student’s understanding of a big mathematical idea, while others focus on students’ procedural fluency. Each part of any multi-step problem has a clear objective, is aligned with the explicit expectations of the target standards, and allows teachers to identify whether students are struggling with the foundational math concept or the multi-step aspect of the problem.
 - Optional Practice
 - Includes problems from current lessons along with a mix of topics from previous lessons.

Summative Assessment/Progress Checks:

Unit 5:

- Progress Check #1
- End – of – Mission Assessment – Topics C & D - Progress Check #2

Suggested Learning Experiences and Instruction

- Students will represent sample spaces using lists, tables, and tree diagrams to identify all possible outcomes of a chance experiment.
- Students will generate and analyze samples from a population, identifying whether samples are representative or show overrepresentation or underrepresentation.
- Students will compare samples and populations to make inferences and draw conclusions about real-world situations.

Differentiation/Intervention/Enrichment Options:

- Students will benefit from predictable lesson structures and a progression from concrete to abstract learning that supports sense-making and reduces cognitive load.
- Students will engage in both independent thinking and collaboration, building confidence and deepening understanding with peer and teacher support.
- Students will access content through real-world contexts and multiple modalities (aligned to UDL), ensuring meaningful and accessible entry points for diverse learners.

- Students will be supported with embedded scaffolds and structured tools (e.g., guided notes, graphic organizers, checklists) to promote access, participation, and independence.
- Students will utilize accessible design features and assistive technologies (e.g., clear visuals, text-to-speech) to support understanding and engagement.
- Students will learn in flexible, supportive environments with opportunities to use manipulatives, adjust pacing, and revisit content as needed.

For Language Development:

- Students will benefit from explicit instruction and repeated exposure to key mathematical vocabulary, helping them build confidence in using academic language.
- Students will be supported through structured discussion routines (e.g., Think-Pair-Share) that include sentence frames and conversation starters to guide participation.
- Students will engage in meaningful math conversations where they explain their thinking, listen to others, and build on shared ideas.
- Students will be supported by the use of multiple languages when appropriate, allowing them to process mathematical ideas in their first language to deepen understanding.
- Students will access learning through visual supports, models, and teacher-created displays that capture and reinforce important language and concepts.
- Students should participate in structured language routines (such as clarifying responses, comparing strategies, and refining ideas) that strengthen both mathematical reasoning and language development.

For Learners Who Require further intervention:

- Students will be supported through built-in, just-in-time scaffolds within digital lessons that connect new learning to prior knowledge and address gaps as they arise.
- Students will receive adaptive support during lessons through visual and conceptual models that strengthen understanding of key mathematical ideas.
- Students will benefit from ongoing diagnostic tools (like the Tower of Power) that identify areas of struggle and provide immediate, targeted support (“Boosts”).
- Students should receive additional foundational lessons when needed, helping them build essential skills connected to grade-level content.
- Students will access learning through personalized assignments that allow them to move between grade-level work and targeted support seamlessly and without stigma.
- Students will benefit from teacher monitoring and data reports that guide instructional decisions and provide deeper interventions when necessary.

Unit 6: Probability

Mission 8: Probability & Sampling

Desired Results

Essential Questions:

- How can we determine and represent all possible outcomes of a chance experiment?
- What does probability tell us about how likely an event is to occur?
- How can we use simulations to estimate probability, and how reliable are those estimates?
- How does long-run frequency help us understand and predict probability?
- How can counting outcomes in a sample space help us calculate probability accurately?

Enduring Understandings:

Students will understand how to...

Mission 8, Topic A: Probabilities of Single Step Events

- Lesson 1: Mystery Bags
- Lesson 2: Chance Experiments
- Lesson 3: What are probabilities?
- Lesson 4: Estimating Probabilities through Repeated Experiments
- Lesson 5: More Estimating Probabilities
- Lesson 6: Estimating Probabilities using Simulations (optional)

Mission 8, Topic B: Probabilities of Multi-Step Events

- Lesson 7: Simulating Multi-Steps Experiments
- Lesson 8: Keeping Track of all Possible Outcomes
- Lesson 9: Multi-Step Experiments
- Lesson 10: Designing Simulations

Knowledge:

Mission 8 Vocabulary

certain, center (of a distribution), chance experiment, distribution, equally likely as not, event, impossible, interquartile range (IQR), less likely, likely, mean, mean absolute deviation (MAD), measure of center, measure of variability, median, mode, more likely, outcome, overlap, population, probability, proportion, random, random sample, representative sample, sample, sample space, simulation, spread, survey, symmetric, tree (diagram), unlikely

Skills:

Mission 8, Topic A: Probabilities of Single Step Events

- Lesson 1: Determine the likelihood of an event by using results from previous experiments.
- Lesson 2: Describe the likelihood of events and order events from least likely to most likely.
- Lesson 3: List the sample space of a chance experiment and calculate the probability of an event when all outcomes are equally likely.
- Lesson 4: Generalize that cumulative relative frequency approaches the probability of an event as an experiment is repeated many times.
- Lesson 5: Use the results from a repeated experiment to estimate the probability of an event.
- Lesson 6: Simulate real-world situations with simple experiments that reflect the probability of the actual event.

Mission 8, Topic B: Probabilities of Multi-Step Events

- Lesson 7: Use a simulation to estimate the probability of a multi-step event.
- Lesson 8: Find the sample space for multi-step experiments using tables, trees, and organized lists, and determine the total number of possible outcomes for a compound event.
- Lesson 9: Use the sample space to calculate the probability of an event in a multi-step experiment.
- Lesson 10: Design a multi-step experiment to simulate a compound event, and perform a simulation to estimate its probability.

Standards:

Previous Standards:

CC.2.4.6.B.1 – Develop an understanding of statistical variability by collecting, organizing, displaying, and analyzing data

CC.2.1.6.E.2 – Identify and choose appropriate processes to compute fluently with multi-digit numbers

CC.2.2.6.B.3 – Represent and analyze quantitative relationships between dependent and independent variables

7th grade Core Standard:

CC.2.4.7.B.1 – Draw inferences about populations based on random sampling concepts

CC.2.4.7.B.2 – Draw informal comparative inferences about two populations

Acceptable Evidence

Assessments focus on the big ideas of mathematics and allow students to demonstrate their understanding across multiple modalities through a thoughtful balance of software- and paper-

based experiences. All assessments are designed to fit into the classroom model and allocated time, and to enhance – rather than distract from – instruction.

Acceptable evidence:

Lesson Components:

- Warm-up
- Fluency
- Guided Practice
- Independent Practice
- Wrap-up

Formative/Summative Assessments:

- **Daily lesson – level assessments:** Lesson – level assessments are embedded into the curriculum and occur as part of recommended daily core instructional time, not in addition to it.
 - **The Tower of Power (Digital)**
 - The Tower of Power is a scaffolded assessment, administered automatically at the end of each Independent Digital Lesson. The Tower of Power is focused on the content of a single lesson and allows students to demonstrate their new understanding. If students make a mistake, they receive real-time remediation at the point of misconception, allowing them to correct their understanding and continue through the assessment. Each Tower of Power contains two to four stages of problems that increase in complexity and decrease in scaffolding as students progress. The problems in each stage are carefully designed to focus on the big ideas of each lesson, mirroring the progression of learning students have just completed. Students must successfully complete 100% of the Tower of Power before moving on to their next Independent Digital Lesson. Since the Tower of Power is software-based, teachers can access a report that lets them know if a student is struggling with the daily digital assessment, allowing them to adjust instruction as needed.
 - **Exit Ticket (Paper)**
 - The Exit Ticket is a paper assessment that is also focused on the content of a single lesson but is less scaffolded than the Tower of Power. The Exit Ticket is optional and can be administered after the completion of each Independent Digital Lesson, providing teachers with a second data point that they can use to monitor daily learning. The Exit Ticket determines if the student transferred their learning from the Independent Digital Lesson to a less scaffolded, open-response item that requires them to show their thinking and work by drawing models, writing explanations, or both. Since Exit Ticket problems are designed to highlight the big

mathematical idea of each lesson, or a piece of it, we do not recommend editing them for content.

- **Mission – Level Assessments/Progress Monitoring:** Mission-level assessments with scoring guidance and detailed rubrics are used for consistency and fidelity of program management. Mid-Mission and End-of-Mission assessments are assessments administered roughly halfway through the Mission and at the conclusion of the Mission respectively.
 - Mid-Mission & End-of-Mission
 - Paper assessments consist of open-response items that require students to show their work or explain their thinking in a variety of ways, including drawing models and writing explanations, similar to an Exit Ticket. Some assessment items highlight a student’s understanding of a big mathematical idea, while others focus on students’ procedural fluency. Each part of any multi-step problem has a clear objective, is aligned with the explicit expectations of the target standards, and allows teachers to identify whether students are struggling with the foundational math concept or the multi-step aspect of the problem.
 - Optional Practice
 - Includes problems from current lessons along with a mix of topics from previous lessons.

Summative Assessment/Progress Checks:

Unit 5:

- Progress Check #1
- Progress Check #2
- Mid – Mission Assessment – Topics A & B – Progress Check #3

Suggested Learning Experiences and Instruction

- Students will use key probability and statistics vocabulary (e.g., event, outcome, sample space, probability, population, sample) to describe and analyze chance situations.
- Students will represent sample spaces using lists, tables, and tree diagrams to identify all possible outcomes of a chance experiment.
- Students will calculate probabilities by determining favorable outcomes and comparing them to the total number of possible outcomes.
- Students will design and use simulations to estimate probabilities and understand probability as long-run relative frequency.
- Students will generate and analyze samples from a population, identifying whether samples are representative or show overrepresentation or underrepresentation.

- Students will compare samples and populations to make inferences and draw conclusions about real-world situations.

Differentiation/Intervention/Enrichment Options:

- Students will benefit from predictable lesson structures and a progression from concrete to abstract learning that supports sense-making and reduces cognitive load.
- Students will engage in both independent thinking and collaboration, building confidence and deepening understanding with peer and teacher support.
- Students will access content through real-world contexts and multiple modalities (aligned to UDL), ensuring meaningful and accessible entry points for diverse learners.
- Students will be supported with embedded scaffolds and structured tools (e.g., guided notes, graphic organizers, checklists) to promote access, participation, and independence.
- Students will utilize accessible design features and assistive technologies (e.g., clear visuals, text-to-speech) to support understanding and engagement.
- Students will learn in flexible, supportive environments with opportunities to use manipulatives, adjust pacing, and revisit content as needed.

For Language Development:

- Students will benefit from explicit instruction and repeated exposure to key mathematical vocabulary, helping them build confidence in using academic language.
- Students will be supported through structured discussion routines (e.g., Think-Pair-Share) that include sentence frames and conversation starters to guide participation.
- Students will engage in meaningful math conversations where they explain their thinking, listen to others, and build on shared ideas.
- Students will be supported by the use of multiple languages when appropriate, allowing them to process mathematical ideas in their first language to deepen understanding.
- Students will access learning through visual supports, models, and teacher-created displays that capture and reinforce important language and concepts.
- Students should participate in structured language routines (such as clarifying responses, comparing strategies, and refining ideas) that strengthen both mathematical reasoning and language development.

For Learners Who Require further intervention:

- Students will be supported through built-in, just-in-time scaffolds within digital lessons that connect new learning to prior knowledge and address gaps as they arise.
- Students will receive adaptive support during lessons through visual and conceptual models that strengthen understanding of key mathematical ideas.
- Students will benefit from ongoing diagnostic tools (like the Tower of Power) that identify areas of struggle and provide immediate, targeted support (“Boosts”).

- Students should receive additional foundational lessons when needed, helping them build essential skills connected to grade-level content.
- Students will access learning through personalized assignments that allow them to move between grade-level work and targeted support seamlessly and without stigma.
- Students will benefit from teacher monitoring and data reports that guide instructional decisions and provide deeper interventions when necessary.