



Academic Math 6

Course Number: 2625

Course Level: Academic Math 6

Grade: 6

Time/Credit: 1 year/ 94 minutes daily

Development Date: Fall 2025 – Spring 2026

School Board Approval:

Central Bucks School District
20 Welden Drive
Doylestown, PA 18901

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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.

K-12 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.

K-12 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 affect a figure's 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?

Academic Math 6 Overview

Desired Results

Course Description: This course is designed for students who are on track with grade-level content and material. This course will cover all sixth-grade standards preparing students for Academic Math 7 in seventh grade. Topics covered will include number systems and operations, ratio and rate, expressions, equations, inequalities, geometry, and data analysis.

The course structure also allows students who require support to receive targeted intervention within the 94-minute instructional block. The sixth-grade mathematics teacher will provide differentiated levels of support through the daily instructional model found in the appendix at the end of the document.

Prerequisite: Academic Math 5

Committee Members: Katie Marttila, Mike Lechniak, Jaime Lemon, Megan Milroy, Stacy Cunningham, Rachel Lodwig, Brian Yannarella, Amanda Higgins, Casey McCullion, Brian Novick, Math Supervisor

Pacing Guide

Academic Math 6 Pacing Guide

Course Overview	Days
Unit 1: Number Systems and Operations	35
Unit 2: Ratio and Rate Reasoning	27
Unit 3: Expressions, Equations, and Inequalities	31
Unit 4: Relationships in Geometry	26
Unit 5: Data Collection and Analysis	21
Standards Based Practice Review	2
Total Prior to PSSA Testing	142
Unit 6: Module 3, 4, 5 from Into Math Grade 7	23
Beginning of Year Activities/Review/Remediation	2
Flex Days – Field Trips, Snow Days, Half Days, Assemblies, School Activities, etc.	8
PSSA Testing – 1 Day for ELA, 2 Days for Math	3
Final Exam/EOY Test and Review	2
Total Days	180

Unit 1 – Number Systems and Operations (No Calculator) 35 days	
Module 1: Integer Concepts (No Calculator)	6
Lesson 1.0 Are you Ready, Prerequisite Skill Review	1
Lesson 1.1 Identify and Interpret Integers	1
Lesson 1.2 Compare and Order Integers on a Number Line	1
Lesson 1.3 Find and Apply Absolute Value	1
Intervention and Enrichment; Review	1
Module 1 Summative Test	1
Module 2: Rational Number Concepts (No Calculator)	8
Lesson 2.0 Are you Ready, Prerequisite Skill Review	1
Lesson 2.1 Interpret Rational Numbers	1
Lesson 2.2 Compare Rational Numbers on a Number Line	1
Summative Quiz	0.5
Lesson 2.3 Find and Apply LCM and GCF	1.5
Lesson 2.4 Order Rational Numbers	1
Intervention and Enrichment; Review	1
Module 2 Summative Assessment	1
Module 3: Fraction Division (No Calculator)	12
Lesson 3.0 Are you Ready, Prerequisite Skill Review	1
Lesson 3.1 Understand Fraction Division	1
Lesson 3.2 Explore Division of Fractions with Unlike Denominators	2
Lesson 3.3 Explore Division of Mixed Numbers	2
Summative Quiz	0.5
Lesson 3.4 Practice and Apply Division of Fractions and Mixed Numbers	1.5
Lesson 3.5 Practice Fraction Operations	2
Intervention and Enrichment; Review	1
Module 3 Summative Assessment	1
Module 4: Fluency with Multi-Digit Decimal Operations (No Calculator)	8
Lesson 4.0 Are you Ready, Prerequisite Skill Review	1
Lesson 4.1 Add and Subtract Multi-Digit Decimals	1
Lesson 4.2 Multiply Multi-Digit Decimals	1
Lesson 4.3 Divide Multi-Digit Whole Numbers	1
Lesson 4.4 Divide Multi-Digit Decimals	1
Lesson 4.5 Apply Operations with Multi-Digit Decimals	1
Intervention and Enrichment; Review	1
Module 4 Summative Assessment	1
Unit 1	1
• Retrieval Activity	
• Performance Task	
• Project	
• Intervention and Enrichment	

Unit 2 – Ratio and Rate Reasoning 27 Days	
Module 5: Ratios and Rates	11
Lesson 5.0 Are you Ready, Prerequisite Skill Review	1
Lesson 5.1 Understand the Concept and Language of Ratios	1
Lesson 5.2 Represent Ratios and Rates with Tables and Graphs	2
Lesson 5.3 Compare Ratios and Rates	1
Summative Quiz	0.5
Lesson 5.4 Find and Apply Unit Rates	1.5
Lesson 5.5 Solve Ratio and Rate Problems Using Proportional Reasoning	2
Intervention and Enrichment; Review	1
Module 5 Summative Assessment	1
Module 6: Apply Ratios and Rates to Measurement	7
Lesson 6.0 Are you Ready, Prerequisite Skill Review	1
Lesson 6.1 Use Ratio Reasoning with Circle Graphs	1
Lesson 6.2 Use Rate Reasoning to Convert Within Measurement Systems	1
Lesson 6.3 Use Rate Reasoning to Convert Between Measurement Systems	2
Intervention and Enrichment; Review	1
Module 6 Summative Assessment	1
Module 7: Understand and Apply Percent	8
Lesson 7.0 Are you Ready, Prerequisite Skill Review	1
Lesson 7.1 Understand, Express, and Compare Percent Ratios	2
Lesson 7.2 Use Strategies to Find a Percent of a Quantity	2
Lesson 7.3 Solve a Variety of Percent Problems	1
Intervention and Enrichment; Review	1
Module 7 Summative Assessment	1
Unit 2	1
• Retrieval Activity	
• Performance Task	
• Project	
• Intervention and Enrichment	

Unit 3: Expressions, Equations, and Inequalities 31 days	
Module 8: Numerical and Algebraic Expressions	10
Lesson 8.0 Are you Ready, Prerequisite Skill Review	0.5
Lesson 8.1 Understand and Apply Exponents	0.5
Lesson 8.2 Write and Evaluate Numerical Expressions for Situations	2
Lesson 8.3 Write Algebraic Expressions to Model Situations	1
Summative Quiz	0.5
Lesson 8.4 Interpret and Evaluate Algebraic Expressions	1.5
Lesson 8.5 Identify and Generate Equivalent Algebraic Expressions	2

Intervention and Enrichment; Review	1
Module 8 Summative Assessment	1
Module 9: Solve Problems Using Equations and Inequalities	12
Lesson 9.0 Are you Ready, Prerequisite Skill Review	1
Lesson 9.1 Write Equations to Represent Situations	1
Lesson 9.2 Use Addition and Subtraction Equations to Solve Problems	2
Lesson 9.3 Use Multiplication and Division Equations to Solve Problems	2
Summative Quiz	0.5
Lesson 9.4 Use One-Step Equations to Solve a Variety of Problems	2.5
Lesson 9.5 Write and Graph Inequalities	1
Intervention and Enrichment; Review	1
Module 9 Summative Assessment	1
Module 10: Real-World Relationships Between Variables	8
Lesson 10.0 Are you Ready, Prerequisite Skill Review	1
Lesson 10.1 Represent Equations in Tables and Graphs	2
Lesson 10.2 Write Equations from Verbal Descriptions	1
Lesson 10.3 Write Equations from Tables and Graphs	2
Intervention and Enrichment; Review	1
Module 10 Summative Assessment	1
Unit 3	1
• Retrieval Activity	
• Performance Task	
• Project	
• Intervention and Enrichment	

Unit 4: Relationships in Geometry	
26 days	
Module 11: Polygons on the Coordinate Plane	10
Lesson 11.0 Are you Ready, Prerequisite Skill Review	1
Lesson 11.1 Graph Rational Numbers on the Coordinate Plane	2
Lesson 11.2 Graph Polygons on the Coordinate Plane	1
Lesson 11.3 Find Distance on the Coordinate Plane	2
Lesson 11.4 Find Perimeter and Area on the Coordinate Plane	2
Intervention and Enrichment; Review	1
Module 11 Summative Assessment	1
Module 12: Area of Triangles and Special Quadrilaterals	8
Lesson 12.0 Are you Ready, Prerequisite Skill Review	1
Lesson 12.1 Develop and Use the Formula for Area of Parallelograms	1
Lesson 12.2 Develop and Use the Formula for Area of Triangles	1
Lesson 12.3 Develop and Use the Formula for Area of Trapezoids	1.5
Lesson 12.4 Find Area of Composite Figures	1.5
Intervention and Enrichment; Review	1

Module 12 Summative Assessment	1
Module 13: Surface Area and Volume	7
Lesson 13.0 Are you Ready, Prerequisite Skill Review	1
Lesson 13.1 Explore Nets and Surface Area	2
Lesson 13.2 Find Volume of Rectangular Prisms	1
Lesson 13.3 Solve Volume Problems	1
Intervention and Enrichment; Review	1
Module 13 Summative Assessment	1
Unit 4	1
• Retrieval Activity	
• Performance Task	
• Project	
• Intervention and Enrichment	

Unit 5: Data Collection and Analysis 21 days	
Module 14: Data Collection and Displays	6
Lesson 14.0 Are you Ready, Prerequisite Skill Review	0.5
Lesson 14.1 Explore Statistical Data Collection	1
Lesson 14.2 Display Data in Dot Plots	1
Lesson 14.3 Make Histograms and Frequency Tables	1.5
Intervention and Enrichment; Review	1
Module 14 Summative Assessment	1
Module 15: Measures of Center	6
Lesson 15.0 Are you Ready, Prerequisite Skill Review	1
Lesson 15.1 Explore Mean as Fair Share	1
Lesson 15.2 Find Measures of Center	1
Lesson 15.3 Choose a Measure of Center	1
Intervention and Enrichment; Review	1
Module 15 Summative Assessment	1
Module 16: Variability and Data Distribution	8
Lesson 16.0 Are you Ready, Prerequisite Skill Review	0.5
Lesson 16.1 Explore Patterns of Data	0.5
Lesson 16.2 Display Data in Box Plots	1.5
Lesson 16.3 Find Mean Absolute Deviation	1.5
Lesson 16.4 Explore Measures of Variability	1
Lesson 16.5 Describe Distributions	1
Intervention and Enrichment; Review	1
Module 16 Summative Assessment	1

Unit 5	
• Retrieval Activity • Performance Task • Project • Intervention and Enrichment	1

All material for Academic 6 is covered prior to PSSA.

The following modules are 7th grade standards

Unit 6 – Rational Number Operations	
23 Days	
Module 3: Understand Addition and Subtraction of Rational Numbers (No Calculator)	
Module 4: Add and Subtract Rational Numbers (No Calculator)	14
Lesson 3.0 and 4.0 Are you Ready, Prerequisite Skill Review	1
Lesson 3.1 Add or Subtract a Positive Integer on a Number Line	2
Lesson 3.2 Add or Subtract a Negative Integer on a Number Line	
Supplement: Adding and Subtracting Rational Numbers using a calculator	
Lesson 4.1 Compute Sums of Integers	2
Lesson 4.2 Compute Differences of Integers	2
Intervention and Enrichment; Review	1
Summative Quiz (Include 3.1, 3.2, 4.1, 4.2)	1
Lesson 4.3 Compute Sums and Differences of Rational Numbers	2
Lesson 4.4 Apply Properties to Multi-Step Addition and Subtraction Problems	1
Intervention and Enrichment; Review	1
Module 3 & 4 Summative Assessment (No Calculator)	1
Module 5: Multiply and Divide Rational Numbers	9
Day 0	1
Lesson 5.0 Are you Ready, Prerequisite Skill Review	1
Lesson 5.1 Understand Multiplication and Division of Rational Numbers	2
Lesson 5.2 Multiply Rational Numbers	2
Lesson 5.3 Write Fractions as Decimals and Divide Integers Lesson	1
Lesson 5.4 Multiply and Divide Rational Numbers in Context	1
Intervention and Enrichment; Review	1
Module 5 Summative Assessment	1

End of Year Test	2
Review	1
Final Exam/EOY Test	1

Acceptable Evidence

Common Summative Assessments: There is a common summative assessment for each module.

Final Exam Grade: Final exam counts for 10% of the students' course grade.

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

- Each marking period grade counts for 22.5% of the students' course grade.
- The final exam counts for 10% of the students' course grade.

Additional remediation in standards/content from the grade level (or previous grade level) where the student completes this course will be provided for students when the teacher determines a student has not yet mastered that content. Enrichment opportunities will also be provided to meet the needs of students that acquire an understanding of the content faster than their class peers.

Required and Supplementary Texts/Software

HMH Into Math – Grade 6

ISBN: 978-0-358-11581-6

Burger, E. B., Dixon, J. K., Kanold, T. D., Larson, M. R., Leinwand, S., & Houghton Mifflin Harcourt Publishing Company. (2020). Into math. Grade 6. Orlando, Florida: Houghton Mifflin Harcourt.

Zearn Math

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

IXL Math

Calculator Recommendation

The secondary mathematics department of Central Bucks School district recognizes the use of Calculators are 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 tests. While no specific brands are endorsed, there are restrictions on the types of calculators allowed on certain classroom tests and final exams. Calculators that perform operations with variables, such as the TI-89, TI-92, and HP49G, will not be permitted on district assessments and final exams, even though they may be used on some nationwide tests. Teachers have discretion as to whether these types may be used for classroom-related purposes.

Background: Fact fluency is a major emphasis in the elementary program. The math department believes in maintaining these foundational skills while teaching calculator

proficiency. Students are permitted to use a calculator on the majority of standardized tests (PSSA, Keystone Algebra 1, SAT, etc.).

With this background in mind, students are always allowed to use a calculator on summative assessments unless it is indicated that calculators are not permitted for specific assessments and/or questions.

Central Bucks School District – Course of Study

Unit 1: Number Systems and Operations

Module 1: Integer Concepts

Module 2: Rational Number Concepts

Module 3: Fraction Division

Module 4: Decimal Operations

Desired Results

Essential Questions:

- How do integers and their positions on a number line help us represent real-world situations involving direction, change, and magnitude?
- How does absolute value help us interpret the distance of a number from zero in meaningful contexts?
- How can rational numbers (fractions and decimals, positive and negative) be compared and ordered to make sense of real-world situations?
- What does it mean for two rational numbers to be opposites, and how does that relationship help us understand quantities and change?
- What does it mean to divide a fraction by a fraction, and how do models help us understand this process?
- How can division of fractions be applied to solve real-world problems efficiently and accurately?
- How does understanding place value help us add, subtract, multiply, and divide decimals precisely?
- How can estimation and reasoning help us determine whether a decimal answer is reasonable in a real-world context?

Enduring Understandings:

Students will understand how to...

Module 1:

- Identify and Interpret Integers
- Compare and Order Integers on a Number Line
- Find and Apply Absolute Value

Module 2:

- Interpret Rational Numbers
- Compare Rational Numbers on a Number Line
- Find and Apply LCM and GCF
- Order Rational Numbers

Module 3:

- Understand Fraction Division
- Explore Division of Fractions with Unlike Denominators
- Explore Division of Mixed Numbers
- Practice and Apply Division of Fractions and Mixed Numbers
- Practice Fraction Operations

Module 4:

- Add and subtract multi-digit decimals
- Multiply multi-digit decimals
- Divide multi-digit whole numbers
- Divide multi-digit decimals
- Apply operations with multi-digit decimals

Knowledge:

Unit 1 Vocabulary

Integers, negative number, opposites, positive number, inequality, absolute value, rational number, greatest common factor, least common multiple, dividend, divisor, expression, quotient, denominator, numerator, multiplicative inverse, reciprocal, rectangle, simplify, simplest form, remainder, equivalent

Skills:

Module 1:

- Identify and interpret integers using a number line.
- Use number lines to compare and order integers.
- Find and use absolute value in real-world situations.

Module 2:

- Graph rational numbers on vertical and horizontal number lines.
- Compare rational numbers using a number line.
- Compare rational numbers using the GCF and LCM.
- Use strategies to order rational numbers.

Module 3

- Divide fractions with the same denominators.
- Divide fractions with unlike denominators.
- Divide mixed numbers.
- Divide fractions and mixed numbers.
- Use LCM and GCF to add, subtract, multiply and divide fractions.

Module 4

- Add and subtract multi-digit decimals.
- Multiply multi-digit decimals.
- Divide multi-digit whole numbers using the standard algorithm.
- Divide multi-digit decimals using the standard algorithm.
- Solve real-world problems involving operations with multi-digit decimals.

Standards:

Priority Standards:

- **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.2.1.6.E.4:** Apply and extend previous understandings of numbers to the system of rational numbers.

Eligible Content:

- **M06.A-N.1.1.1:** Interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions.
- **M06.A-N.2.1.1:** Solve problems involving operations (+, −, ×, ÷) with whole numbers, decimals (through thousandths), straight computation, or word problem.
- **M06.A-N.2.2.1:** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.
- **M06.A-N.2.2.2:** Apply the distributive property to express a sum of two whole numbers, 1 through 100, with a common factor as a multiple of a sum of two whole numbers with no common factor.
- **M06.A-N.3.1.1:** Represent quantities in real-world contexts using positive and negative numbers, explaining the meaning of 0 in each situation (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge).
- **M06.A-N.3.1.2:** Determine the opposite of a number and recognize that the opposite of the opposite of a number is the number itself (e.g., $-(-3) = 3$; 0 is its own opposite).
- **M06.A-N.3.1.3:** Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane.
- **M06.A-N.3.2.1:** Write, interpret, and explain statements of order for rational numbers in real-world contexts.
- **M06.A-N.3.2.2:** Interpret the absolute value of a rational number as its distance from 0 on the number line and as a magnitude for a positive or negative quantity in a real-world situation.

Acceptable Evidence

Problem Solving Tasks:

- Unit 1 Project: Cocoa Costs (Use after 4.3)
- Event Organizer STEM Task (pg. 1)
- Unit 1 Performance Task (use after Module 4)

Acceptable evidence of learning other than Problem Solving Tasks:

Formative Assessments

- Spark your learning
- Learn Together Tasks
- Spiral Review
- Test Prep
- Warm-up
- Keep a notebook with pencil/paper or Microsoft OneNote
- Exit Slips
- More Practice/Homework
- Fluency Practice

Summative Assessment:

- Module 1:
 - Module 1 Assessment
- Module 2:
 - Module 2: 2.1 – 2.2 Summative Quiz
 - Module 2 Assessment
- Module 3:
 - Module 3: 3.1 – 3.3 Summative Quiz
 - Module 3 Assessment
- Module 4 Test
 - Module 4 Assessment

Suggested Learning Experiences and Instruction

- The student will identify that a number and its opposite are the same distance from 0 on a number line but lie on opposite sides (e.g., 3 and -3).
- The student will understand that a negative sign can mean “negative” or “the opposite of,” such as -3 meaning negative 3 and $-(-3)$ meaning the opposite of -3.
- The student will recognize that the opposite of the opposite of a number is the number itself, expressed as $-(-a) = a$.
- The student will describe integers as all whole numbers and their opposites (... , -3, -2, -1, 0, 1, 2, 3, ...).
- The student will explain that integers are symmetric about 0 on the number line, and folding at 0 pairs each integer with its opposite.

- The student will apply the rule that dividing by a fraction is the same as multiplying by its reciprocal: $a/b \div c/d = a/b \times d/c$ (with nonzero denominators).
- The student will connect division and multiplication using models, such as grouping to solve problems like $2 \div 1/4 = 8$.
- The student will explain that the reciprocal represents how many of the divisor-sized groups fit in one whole, and multiplying by it gives the same result as the original division.

Differentiation/Intervention/Enrichment Options:

- Utilize study guide and intervention for students who need more reteaching.
- Use the skills practice as extra practice for students who need more entry level practice to master the concept.
- Use the More Practice / Homework worksheet as a standard practice sheet.
- Leverage the Word problem practice to provide additional opportunities for students to engage in solving problems utilizing the skill from the lesson.
- Use the enrichment sheet to provide higher-level practice opportunities for students.
- Utilize Reteach, Challenge, Tier 2, and Tier 3 practice sheets for varying levels of student understanding.

For Language Development:

- Create a student-made dictionary that includes terms, definitions, and examples organized by chapter.
- Make flash cards for terms and examples, then mix and match.
- Use the study guide document with clear definitions and vocabulary development opportunities.
- Encourage students to use the chapter vocabulary.
- Multilingual Glossaries

For Advanced Learners:

- Meet in small groups with students who need enrichment to provide instruction and learning activities on the optional skills followed up by an alternative and more complex assignment.
- Excuse the students from standard practice and use appropriately challenging practice that requires students to apply the concepts in more rigorous ways to challenge their thinking and allow students to go deeper into the same skills.
- Provide more rigorous opportunities for mathematical proof.
- Leverage the resources available throughout the textbook and digital resources.
 - Practice sets from the textbook based on the readiness level to address individual needs.
 - Application practice
 - Enrichment projects

Unit 2: Ratios and Rate Reasoning

Module 5: Ratios and Rates

Module 6: Apply Ratios and Rates to Measurement

Module 7: Understand and Apply Percent

Desired Results

Essential Questions:

- How can ratios and rates be used to describe and compare relationships between quantities?
- How do models and unit rates help represent, analyze, and solve ratio and rate problems?
- How can ratio and rate reasoning be applied to measurement and unit conversion problems?
- How do proportional relationships help solve real-world measurement situations?
- How is percent connected to fractions, decimals, and ratios?
- How can percent be used to solve real-world problems involving comparisons and change?

Enduring Understandings:

Students will understand how to...

Module 5:

- Understand the Concept and Language of Ratios
- Represent Ratios and Rates with Tables and Graphs
- Compare Ratios and Rates
- Find and Apply Unit Rates
- Solve Ratio and Rate Problems Using Proportional Reasoning

Module 6:

- Use Ratio Reasoning with Circle Graphs
- Use Rate Reasoning to Convert Within Measurement Systems
- Use Rate Reasoning to Convert Between Measurement Systems

Module 7:

- Understand, Express, and Compare Percent Ratios
- Use Strategies to Find a Percent of a Quantity
- Solve a Variety of Percent Problems

Knowledge:

Unit 2 Vocabulary

Ratio, point, equivalent ratios, rate, unit rate, circle, circle graph, conversion factor, customary system, metric system, percent

Skills:

Module 5:

- Understand and write ratios.
- Learn to use tables and graphs to represent ratios and rates.
- Use a table or double number lines to compare ratios and rates.
- Find and use unit rates to solve problems.
- Use equivalent ratios to solve real-world problems.

Module 6:

- Apply ratio reasoning to make and interpret circle graphs.
- Convert units within a measurement system.
- Use equivalent ratios to convert measurements between measurement systems.

Module 7:

- Write a ratio as a percent.
- Find a percent of a quantity.
- Use percents to solve real-world problems.

Standards:

Priority Standards:

- **CC.2.1.6.D.1** Students acquire the knowledge and skills needed to: Understand ratio concepts and use ratio reasoning to solve problems.

Eligible Content:

- **M06.A-R.1.1.1** Use ratio language and notation (such as 3 to 4, 3:4, $\frac{3}{4}$) to describe a ratio relationship between two quantities.
- **M06.A-R.1.1.2** Find the unit rate a/b associated with a ratio $a:b$ (with $b \neq 0$) and use rate language in the context of a ratio relationship.
- **M06.A-R.1.1.3** Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios.
- **M06.A-R.1.1.4** Solve unit rate problems including those involving unit pricing and constant speed.
- **M06.A-R.1.1.5** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $30/100$ times the quantity); solve problems involving finding the whole, given a part and the percentage.

Acceptable Evidence

Problem Solving Tasks:

- Unit 2 Project- Record-Deal Ratios (Use after 7.2)
- Music Producer STEM Task (pg. 135)
- Unit 2 Performance Task (after Module 7)

Acceptable evidence of learning other than Problem Solving Tasks:

Formative Assessments

- Spark your learning
- Learn Together Tasks
- Spiral Review
- Test Prep
- Warm-up
- Keep a notebook with pencil/paper or Microsoft OneNote
- Exit Slips
- More Practice/Homework
- Fluency Practice
- Quizzes

Summative Assessment:

- Module 5:
 - Module 5: 5.1-5.3 Summative Quiz
 - Module 5 Assessment
- Module 6:
 - Module 6 Assessment
- Module 7:
 - Module 7 Assessment

Suggested Learning Experiences and Instruction

- The student will compare two quantities using a ratio and represent the comparison in words, colon form, or fraction form.
- The student will identify and generate equivalent ratios by multiplying or dividing both terms by the same nonzero number.
- The student will describe ratios in context to interpret their meaning in real-world situations.
- The student will use visual models, such as grouped pictures or dot diagrams, to understand ratios and create equivalent ratios.
- The student will build equivalent ratios by repeating a known ratio model until reaching the desired terms.
- The student will apply conversion factors to relate equivalent measures using fractions equal to 1.
- The student will understand that percent means “per hundred” and write percents as fractions over 100.
- The student will model percents visually using a 100-square grid to represent the portion indicated.

Differentiation/Intervention/Enrichment Options:

- Utilize study guide and intervention for students who need more reteaching.
- Use the skills practice as extra practice for students who need more entry-level practice to master the concept.
- Use the More Practice / Homework worksheet as a standard practice sheet.
- Leverage the Word problem practice to provide additional opportunities for students to engage in solving problems utilizing the skill from the lesson.
- Using the enrichment sheet provides a higher-level practice opportunity for students demonstrating faster understanding of the concept.
- Utilize Reteach, Challenge, Tier 2, and Tier 3 practice sheets for varying levels of student understanding.

For Language Development:

- Create a student-made dictionary that includes terms, definitions, and examples organized by chapter.
- Make flash cards for terms and examples, then mix and match.
- Use the study guide document with clear definitions and vocabulary development opportunities.
- Encourage students to use the chapter vocabulary.
- Multilingual Glossaries

For Advanced Learners:

- Meet in small groups with students who need enrichment to provide instruction and learning activities on the optional skills followed up by an alternative and more complex assignment.
- Excuse the students from standard practice and use appropriately challenging practice that requires students to apply the concepts in more rigorous ways to challenge their thinking and allow students to go deeper on the same skills.
- Provide more rigorous opportunities for mathematical proof.
- Leverage the resources available throughout the textbook and digital resources.
 - Practice sets from the textbook based on the readiness level to address individual needs.
 - Application practice
 - Enrichment projects

Unit 3: Expressions, Equations, and Inequalities

Module 8: Numerical and Algebraic Expressions

Module 9: Solve Problems Using Equations and Inequalities

Module 10: Real – World Relationships Between Variables

Desired Results

Essential Questions:

- How can variables and expressions represent real-world situations?
- How do the properties of operations help us simplify and evaluate expressions?
- How can equations and inequalities help solve real-life problems?
- What strategies help us determine and verify solutions to equations and inequalities?
- How can tables, graphs, and equations represent relationships between variables?
- How do changes in one quantity affect another, and how can we use this to make predictions?

Enduring Understandings:

Students will understand how to...

Module 8:

- Understand and Apply Exponents
- Write and Evaluate Numerical Expressions for Situations
- Write Algebraic Expressions to Model Situations
- Interpret and Evaluate Algebraic Expressions
- Identify and Generate Equivalent Algebraic Expressions

Module 9:

- Write Equations to Represent Situations
- Use Addition and Subtraction Equations to Solve Problems
- Use Multiplication and Division Equations to Solve Problems
- Use One-Step Equations to Solve a Variety of Problems
- Write and Graph Inequalities

Module 10:

- Represent Equations in Tables and Graphs
- Write Equations from Verbal Descriptions
- Write Equations from Tables and Graphs

Knowledge:

Unit 3 Vocabulary:

Factor, base, exponent, Distributive Property, order of operations, evaluate, numerical expression, term, algebraic expression, coefficient, constant, variable, perimeter, Associative Property of Addition, Associative Property of Multiplication, Commutative Property of Addition, Commutative Property of Multiplication, equivalent expression, like term, triangle, equation, solution of an equation, Addition Property of Equality, Subtraction Property of Equality, Division Property of Equality, Multiplication Property of Equality, angle, degree, constraint, inequality, solution of an inequality, dependent variable, independent variable

Skills:

Module 8:

- Write and find the value of expressions involving exponents.
- Write and evaluate numerical expressions.
- Write an algebraic expression to represent a situation.
- Interpret and evaluate an algebraic expression.
- Identify and generate equivalent expressions.

Module 9:

- Model and write an equation to represent a situation.
- Solve equations that contain addition and subtraction.
- Solve equations that contain multiplication and division.
- Write and use equations to represent situations and solve problems.
- Write and graph inequalities to represent real-world situations.

Module 10:

- Represent an equation in a table or graph.
- Write an equation given a verbal description of a relationship.
- Write an equation using a table or graph.

Standards:

Priority 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 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.

Eligible Content:

- **M06.B-E.1.1.1** – Write and evaluate numerical expressions with whole-number exponents
- **M06.B-E.1.1.2** – Write algebraic expressions from verbal descriptions
- **M06.B-E.1.1.3** – Identify parts of an expression (sum, term, product, factor, quotient, coefficient, quantity)
- **M06.B-E.1.1.4** – Evaluate expressions at specific variable values, including real-world formulas
- **M06.B-E.1.1.5** – Apply properties of operations to generate equivalent expressions
- **M06.B-E.2.1.1** – Use substitution to test whether a number makes an equation or inequality true
- **M06.B-E.2.1.2** – Write algebraic expressions to represent real-world or mathematical problems
- **M06.B-E.2.1.3** – Solve real-world and mathematical problems using $x + p = q$ and $px = q$ (non-negative rational numbers)
- **M06.B-E.3.1.1** – Write equations expressing the relationship between dependent and independent variables
- **M06.B-E.3.1.2** – Analyze relationships using graphs and tables and relate them to equations

Acceptable Evidence

Problem Solving Tasks:

- Unit 3 Project Card: Art in the Expression (use after 9.1)
- Visual Artist STEM Task (pg. 229)
- Unit 3 Performance Task (after Module 10)

Acceptable evidence of learning other than Problem Solving Tasks:

Formative Assessments

- Spark your learning
- Learn Together Tasks
- Spiral Review
- Test Prep
- Warm-up
- Keep a notebook with pencil/paper or Microsoft OneNote
- Exit Slips
- More Practice/Homework
- Fluency Practice
- Quizzes

Summative Assessment:

- Module 8:
 - Module 8: 8.1-8.3 Summative Quiz
 - Module 8 Assessment
- Module 9:
 - Module 9: 9.1-9.3 Summative Quiz
 - Module 9 Assessment
- Module 10:
 - Module 10 Assessment

Suggested Learning Experiences and Instruction

- The student will represent and explain the distributive property as multiplying a factor by a sum, distributing the factor to each addend.
- The student will illustrate the distributive property using area models, showing how the total area equals the sum of individual rectangular areas.
- The student will make connections between numerical expressions and real-world situations by translating words and phrases into equations or inequalities.
- The student will use variables to represent unknown numbers and understand how equations model real-world problems.
- The student will determine whether equations have solutions that make them true and use models to organize information before writing equations.
- The student will distinguish between dependent and independent variables in real-world contexts.
- The student will analyze situations to identify which variable depends on the other and explain how changes in the independent variable affect the dependent variable.

Differentiation/Intervention/Enrichment Options:

- Utilize study guide and intervention for students who need more reteaching.
- Use the skills practice as extra practice for students who need more entry level practice to master the concept.
- Use the More Practice / Homework worksheet as a standard practice sheet.
- Leverage the word problem practice to provide additional opportunities for students to engage in solving problems using the skill from the lesson.
- Use the enrichment sheet to provide higher-level practice opportunities for students.
- Utilize Reteach, Challenge, Tier 2, and Tier 3 practice sheets for varying levels of student understanding.

For Language Development:

- Create a student-made dictionary that includes terms, definitions, and examples organized by chapter.
- Make flash cards for terms and examples, then mix and match.
- Use the study guide document with clear definitions and vocabulary development opportunities.
- Encourage students to use the chapter vocabulary.
- Multilingual Glossaries

For Advanced Learners:

- Meet in small groups with students who need enrichment to provide instruction and learning activities on the optional skills followed up by an alternative and more complex assignment.
- Excuse the students from standard practice and use appropriately challenging practice that requires students to apply the concepts in more rigorous ways to challenge their thinking and allow students to go deeper on the same skills.
- Provide more rigorous opportunities for mathematical proof.
- Leverage the resources available throughout the textbook and digital resources.
 - Practice sets from the textbook based on the readiness level to address individual needs.
 - Application practice
 - Enrichment projects

Unit 4: Relationships in Geometry

Module 11: Polygons on the Coordinate Plane

Module 12: Area of Triangles and Special Quadrilaterals

Module 13: Surface Area and Volume

Desired Results

Essential Questions:

- How can coordinates be used to describe and analyze polygons on the coordinate plane?
- How can we use the coordinate plane to determine distances, side lengths, and shapes of polygons?
- How can we calculate the area of triangles and special quadrilaterals using formulas and reasoning?
- How does understanding shapes and their properties help solve real-world area problems?
- How can we determine the surface area and volume of three-dimensional figures using formulas?
- How does applying surface area and volume concepts help solve practical, real-world problems?

Enduring Understandings:

Students will understand how to...

Module 11:

- Graph Rational Numbers on the Coordinate Plane
- Graph Polygons on the Coordinate Plane
- Find Distance on the Coordinate Plane
- Find Perimeter and Area on the Coordinate Plane

Module 12:

- Develop and Use the Formula for Area of Parallelograms
- Develop and Use the Formula for Area of Triangles
- Develop and Use the Formula for Area of Trapezoids
- Find Area of Composite Figures

Module 13:

- Explore Nets and Surface Area
- Find Volume of Rectangular Prisms
- Solve Volume Problems

Knowledge:

Unit 4 Vocabulary:

Axes, coordinates, rectangle, x-coordinate, y-coordinate, hexagon, isosceles triangle, pentagon, quadrilateral, right angle, right triangle, transformation, area, base, height, coordinate plane, ordered pair, origin, quadrant, x-axis, y-axis, polygon, vertex, reflection, base of a parallelogram, height of a parallelogram, parallelogram, base of a triangle, diagonal, height of a triangle, base of a trapezoid, height of a trapezoid, trapezoid, composite figure, solid figure, volume, net, pyramid, surface area

Skills:

Module 11:

- Locate rational ordered pairs on the coordinate plane.
- Solve problems by graphing and identifying polygons in the coordinate plane.
- Use absolute value to find the distance between two points with the same x- or y-coordinate.
- Find the perimeter and area of polygons on the coordinate plane.

Module 12:

- Find the areas of parallelograms.
- Find the area of triangles.
- Find the areas of trapezoids.
- Find the area of composite figures.

Module 13:

- Use nets to find surface area.
- Find the volume of a rectangular prism.
- Write equations to solve problems involving the volume of rectangular prisms.

Standards:

Priority Standards:

- **CC.2.2.6.B.1** – Students acquire the knowledge and skills needed to: Apply and extend previous understandings of arithmetic to algebraic expressions.
- **CC.2.3.6.A.1** – Students acquire the knowledge and skills needed to: Apply appropriate tools to solve real-world and mathematical problems involving area, surface area, and volume.

Eligible Content:

- **M06.A-N.3.1.3** – Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane.
- **M06.A-N.3.2.3** – Solve real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
- **M06.B-E.1.1.4** – Evaluate expressions at specific values of their variables, including expressions that arise from formulas used in real-world problems.
- **M06.C-G.1.1.1** – Determine the area of triangles and special quadrilaterals (i.e., square, rectangle, parallelogram, rhombus, and trapezoid). Formulas will be provided.
- **M06.C-G.1.1.2** – Determine the area of irregular or compound polygons.
- **M06.C-G.1.1.3** – Determine the volume of right rectangular prisms with fractional edge lengths. Formulas will be provided.
- **M06.C-G.1.1.4** – Given coordinates for the vertices of a polygon in the plane, use the coordinates to find side lengths and area of the polygon (limited to triangles and special quadrilaterals). Formulas will be provided.
- **M06.C-G.1.1.5** – Represent three-dimensional figures using nets made of rectangles and triangles.
- **M06.C-G.1.1.6** – Determine the surface area of triangular and rectangular prisms (including cubes). Formulas will be provided.

Acceptable Evidence

Problem Solving Tasks:

- Unit 4 Project Card: Think Outside the Box
- Marketing Manager STEM Task (pg. 337)
- Unit 4 Performance Task (after Module 13)

Acceptable evidence of learning other than Problem Solving Tasks:

Formative Assessments

- Spark your learning
- Learn Together Tasks
- Spiral Review
- Test Prep
- Warm-up
- Keep a notebook with pencil/paper or Microsoft OneNote
- Exit Slips
- More Practice/Homework
- Fluency Practice
- Quizzes

Summative Assessment:

- Module 11 Assessment
- Module 12 Assessment
- Module 13 Assessment

Suggested Learning Experiences and Instruction

- The student will make connections between number lines and coordinate planes to find lengths of horizontal and vertical segments using absolute value.
- The student will calculate distances between points on a coordinate plane, understanding that distance is always positive.
- The student will apply segment lengths to solve problems involving perimeter and area of figures on a coordinate plane.
- The student will understand that area is measured in unit squares and that a unit square has sides of 1 unit and an area of 1 square unit.
- The student will calculate areas of rectangles, parallelograms, triangles, and trapezoids, recognizing that length and width may also be called base and height.
- The student will explore models of rectangular prisms using real-world objects like cereal boxes to understand three-dimensional shapes.
- The student will create and analyze nets of rectangular prisms to determine surface area and understand that different nets for the same prism yield the same surface area.

Differentiation/Intervention/Enrichment Options:

- Utilize study guide and intervention for students who need more reteaching.
- Use the skills practice as extra practice for students who need more entry level practice to master the concept.
- Use the More Practice / Homework worksheet as a standard practice sheet.
- Leverage the Word problem practice to provide additional opportunities for students to engage in solving problems utilizing the skill from the lesson.
- Use the enrichment sheet to provide higher-level practice opportunities for students.
- Utilize Reteach, Challenge, Tier 2, and Tier 3 practice sheets for varying levels of student understanding.

For Language Development:

- Create a student-made dictionary that includes terms, definitions, and examples organized by chapter.
- Make flash cards for terms and examples, then mix and match.
- Use the study guide document with clear definitions and vocabulary development opportunities.
- Encourage students to use the chapter vocabulary.
- Multilingual Glossaries

For Advanced Learners:

- Meet in small groups with students who need enrichment to provide instruction and learning activities on the optional skills followed up by an alternative and more complex assignment.
- Excuse the students from standard practice and use appropriately challenging practice that requires students to apply the concepts in more rigorous ways to challenge their thinking and allow students to go deeper on the same skills.
- Provide more rigorous opportunities for mathematical proof.
- Use the enrichment sheet to provide higher-level practice opportunities for students.
- Leverage the resources available throughout the textbook and digital resources.
 - Practice sets from the textbook based on the readiness level to address individual needs.
 - Application practice
 - Enrichment projects

Unit 5: Data Collection and Analysis

Module 14: Data Collection and Displays

Module 15: Measures of Center

Module 16: Variability and Data Distribution

Desired Results

Essential Questions:

- How can we collect and organize data so it clearly communicates information?
- How do different types of graphs help us identify patterns and relationships in data?
- How do we find the mean, median, and mode of a data set, and when is each most useful?
- How can measures of center help us compare and interpret different sets of data?
- How can we describe the spread or variability of a data set?
- What does the shape of a data distribution tell us about the data and what we can predict from it?

Enduring Understandings:

Students will understand how to...

Module 14:

- Explore Statistical Data Collection
- Display Data in Dot Plots
- Make Histograms and Frequency Tables

Module 15:

- Explore Mean as Fair Share
- Find Measures of Center
- Choose a Measure of Center

Module 16:

- Explore Patterns of Data
- Display Data in Box Plots
- Find Mean Absolute Deviation
- Explore Measures of Variability
- Describe Distributions

Knowledge:

Unit 5 Vocabulary:

Set, data, statistical question, line plot, dot plot, frequency, bar graph, interval, frequency table, histogram, average, mean, measure of center, median, mode, outlier, box plot, lower quartile, upper quartile, mean absolute deviation (MAD), interquartile range (IQR), measure of variability, range

Skills:

Module 14:

- Identify a statistical question and describe data.
- Use dot plots to display data.
- Make histograms and frequency tables to display data.

Module 15:

- Understand how fair share and balance point are related to the mean.
- Describe a set of data using mean, median, and mode.
- Choose an appropriate measure of center to describe a data set.

Module 16:

- Describe overall patterns in a data set.
- Use box plots to display data.
- Determine and use the mean absolute deviation of a set of data points.
- Summarize a set of data by using range, interquartile range, and mean absolute deviation.
- Describe the distribution of a data set collected to answer a statistical question.

Standards:

Priority Standards:

- **CC.2.4.6.B.1** Students acquire the knowledge and skills needed to: Demonstrate an understanding of statistical variability by displaying, analyzing, and summarizing distributions.

Eligible Content:

- **M06.D-S.1.1.1** Display numerical data in plots on a number line, including line plots, histograms, and box-and-whisker plots.
- **M06.D-S.1.1.2** Determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation).
- **M06.D-S.1.1.3** Describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered.
- **M06.D-S.1.1.4** Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Acceptable Evidence

Problem Solving Tasks:

- Unit 5 Project Card: The Right Price
- Sales Director STEM Task (pg. 435)
- Unit 5 Performance Task (after Module 16)

Acceptable evidence of learning other than Problem Solving Tasks:

Formative Assessments

- Spark your learning
- Learn Together Tasks
- Spiral Review
- Test Prep
- Warm-up
- Keep a notebook with pencil/paper or Microsoft OneNote
- Exit Slips
- More Practice/Homework
- Fluency Practice
- Quizzes

Summative Assessment:

- Module 14 Assessment
- Module 15 Assessment
- Module 16 Assessment

Suggested Learning Experiences and Instruction

- The student will identify statistical questions as those that require a set of data to answer and have varying responses, distinguishing them from non-statistical questions.
- The student will recognize that statistical questions can involve non-numerical data, such as colors or categories, by recording frequencies of outcomes.
- The student will calculate the mean of a data set by adding all values and dividing by the number of values.
- The student will use a dot plot to verify that the mean acts as a balance point for a data distribution.
- The student will understand that for the mean to be a balance point, the sum of distances from data points on either side of the mean must be equal.
- The student will determine the distance between each data value and the mean using either counting units on a number line or subtraction to ensure positive distances.
- The student will calculate the mean absolute deviation (MAD) as the average distance of data values from the mean, preparing to use absolute value in future lessons.

Differentiation/Intervention/Enrichment Options:

- Utilize study guide and intervention for students who need more reteaching.
- Use the skills practice as extra practice for students who need more entry level practice to master the concept.
- Use the More Practice / Homework worksheet as a standard practice sheet.
- Leverage the Word problem practice to provide additional opportunities for students to engage in solving problems utilizing the skill from the lesson.
- Using the enrichment sheet provides a higher-level practice opportunity for students demonstrating faster understanding of the concept.
- Utilize Reteach, Challenge, Tier 2, and Tier 3 practice sheets for varying levels of student understanding.

For Language Development:

- Create a student-made dictionary that includes terms, definitions, and examples organized by chapter.
- Make flash cards for terms and examples, then mix and match.
- Use the study guide document with clear definitions and vocabulary development opportunities.
- Encourage students to use the chapter vocabulary.
- Multilingual Glossaries

For Advanced Learners:

- Meet in small groups with students who need enrichment to provide instruction and learning activities on the optional skills followed up by an alternative and more complex assignment.
- Excuse the students from standard practice and use appropriately challenging practice that requires students to apply the concepts in more rigorous ways to challenge their thinking and allow students to go deeper on the same skills.
- Provide more rigorous opportunities for mathematical proof.
- Leverage the resources available throughout the textbook and digital resources.
 - Practice sets from the textbook based on the readiness level to address individual needs.
 - Application practice
 - Enrichment projects

Unit 6: Rational Number Operations

Module 3 (Grade 7): Understand Addition and Subtraction of Rational Numbers

Module 4 (Grade 7): Add and Subtract Rational Numbers

Module 5 (Grade 7): Multiply and Divide Rational Numbers

Desired Results

Essential Questions:

- How can you explain an understanding of adding and subtracting rational numbers?
- What strategies and methods can we use to add and subtract rational numbers in different mathematical problems?
- How do the rules of multiplication and division apply to rational numbers, and how can we use these operations to solve complex problems?
- In what ways can we apply our understanding of rational number operations to systematically solve multi-step real-world and mathematical problems?

Enduring Understandings:

Students will understand how to...

Module 3:

- Add or subtract a positive integer on a number line.
- Add or subtract a negative integer on a number line.
- Use a number line to add and subtract rational numbers.

Module 4:

- Compute sums of integers
- Compute differences of integers
- Compute sums and differences of rational numbers.
- Apply properties to multi-step addition and subtraction problems.

Module 5:

- Understand multiplication and division of rational numbers.
- Multiply rational numbers
- Write fractions as decimals and divide integers.
- Multiply and divide rational numbers in context.

Knowledge:

Unit 2 Vocabulary

Absolute value, addend, Addition property of opposites, additive inverse, Associative property of multiplication, Commutative property of multiplication, Compatible numbers, denominator, distributive property, Dividend, divisor, factor, identity property of addition, identity property of multiplication, integers, inverse operations, Inverse property of multiplication, mixed number, numerator, order of operations, percent error, product, quotient, rational number

Skills:

Module 3:

- Use a number line to add and subtract positive integers.
- Use a number line to add or subtract a negative integer and then assess their results for reasonableness.
- Use a number line to add and subtract rational numbers.

Module 4:

- Calculate the sum of two integers.
- Calculate the difference of two integers without using a number line.
- Fluently add and subtract rational numbers without a number line.
- Use properties to solve multi-step problems involving sums and differences of positive and negative rational numbers.

Module 5:

- Develop rules to find the product or quotient of two integers.
- Find the product of three or more signed rational numbers.
- Express quotients in different forms
- Use products and quotients of rational numbers to solve problems.

Standards:

Priority Standards:

- **CC.2.1.7.E.1** Students acquire the knowledge and skills needed to: Apply and extend previous understandings of operations with fractions to operations with rational numbers.
- **CC.2.1.7.D.1** Students acquire the knowledge and skills needed to: Analyze proportional relationships and use them to model and solve real-world and mathematical problems.
- **CC.2.2.7.B.1** Students acquire the knowledge and skills needed to: Apply properties of operations to generate equivalent expressions.
- **CC.2.2.7.B.3** Students acquire the knowledge and skills needed to: Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

Eligible Content:

- **M07.A-N.1.1.1** Apply properties of operations to add and subtract rational numbers, including real-world contexts.
- **M07.A-N.1.1.2** Represent addition and subtraction on a horizontal or vertical number line.
- **M07.A-N.1.1.3** Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeat.
- **M07.B-E.2.1.1** Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.
- **M07.B-E.2.3.1** Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem.
- **M07.A-R.1.1.6** Use proportional relationships to solve multi-step ratio and percent problems.

Acceptable Evidence

Problem Solving Tasks:

- Unit 2 Project Card (use after 4.3)
- Film Director STEM Task (pg. 97)

Acceptable evidence of learning other than Problem Solving Tasks:

Formative Assessments

- Spark your learning
- Learn Together Tasks
- Spiral Review
- Test Prep
- Warm-up
- Keep a notebook with pencil/paper or Microsoft OneNote
- Exit Slips
- More Practice/Homework
- Fluency Practice
- Quizzes

Summative Assessment:

- Summative Quiz (3.1, 3.2, 4.1, 4.2)
- Module 3 and 4 Test
- Module 5 Test

Suggested Learning Experiences and Instruction

- Students are often taught to add two negative integers by finding the sum of the absolute values of the integers and taking the opposite of the result.
- Use a number line to add and subtract positive negative integers and rational numbers.
- It is important that students are able to apply the correct integer addition or subtraction rule at the appropriate time.
- Students should learn to distinguish among the different types of addition and subtraction problems.
- Students need to apply their prior knowledge of rational numbers to multiply and divide with rational numbers.
- Make students aware of the alternate names for the following properties identity: property of addition, identity property of multiplication, inverse property of addition, inverse property of multiplication.

Differentiation/Intervention/Enrichment Options:

- Utilize study guide and intervention for students who need more reteaching.
- Skills practice is extra practice for students who need more entry level practice to master the concept.
- More Practice / Homework worksheet is a standard practice sheet.
- Word problem practice provides additional opportunities for students to engage in solving problems utilizing the skill from the lesson.
- The enrichment sheet provides a higher-level practice opportunity for students demonstrating faster understanding of the concept.
- Utilize Reteach, Challenge, Tier 2, and Tier 3 practice sheets for varying levels of student understanding.

For Language Development:

- Create a student-made dictionary that includes terms, definitions, and examples organized by chapter.
- Make flash cards for terms and examples, then mix and match.
- Use the study guide document with clear definitions and vocabulary development opportunities.
- Discuss the Chapter Wrap-Up, encouraging students to use the chapter vocabulary.
- Multilingual Glossaries

For Advanced Learners:

- Meet in small groups with students who need enrichment to provide instruction and learning activities on the optional skills followed up by an alternative and more complex assignment.
- Excuse the students from standard practice and use appropriately challenging practice that requires students to apply the concepts in more rigorous ways to challenge their thinking and allow students to go deeper on the same skills.
- Provide more rigorous opportunities for mathematical proof.
- There are many resources available throughout our textbook and digital resources to draw upon for enrichment.
 - Practice sets from the textbook based on the readiness level to address individual needs.
 - Application practice
 - Enrichment projects

Appendix – Sixth Grade Mathematics Instructional Routine

Academic Math 6 Instructional Model	Core Instruction	Small Group Instruction (SGI)		
	60 - 65 minutes/day	30 - 35 minutes/day		
		Tier 2: 12 – 15 minutes 2 times/week (Total: 24 – 30 minutes/week) Tier 3: 12 – 15 minutes 3 times/week (Total: 36 – 45 minutes/week)		
		Tier 1	Tier 2	Tier 3
Monday	INTO MATH (with teacher) Spark, Build Understanding, Step it Out, Check Understanding, On Your Own	INTO MATH (with teacher or independent) Standards – Based Practice, Reteach/Challenge Pages, Test Prep/Spiral Review, Additional Practice, Fluency Maintenance/Builders SUPPLEMENTAL PSSA Practice IXL Quizlet	INTO MATH (with teacher or independent) Standards – Based Practice, Tier 2 Lesson, Math Language Routine, Fluency Maintenance/Builders	INTERVENTION LESSON (with teacher) Zearn
Tuesday			SUPPLEMENTAL PSSA Practice IXL Quizlet	INTERVENTION LESSON (with teacher) Zearn
Wednesday			INTERVENTION LESSON (with teacher) Into Math	INTERVENTION LESSON (with teacher) Zearn
Thursday			INTERVENTION LESSON (with teacher) Into Math	INTERVENTION LESSON (with teacher or independent) Zearn OR INTO MATH (with teacher or independent) Standards – Based Practice, Tier 3 Lesson, Math Language Routine, Fluency Maintenance/Builders, IXL
Friday			Interleaving Practice Format (Retrieval)	
To maximize instructional time and prepare students for 7 th & 8 th grade:				
Assessment	End of Module Assessments (Common Summatives) should be limited to 47 – 60 minutes with a goal of students finishing in 47 minutes to prepare for seventh grade. Module Quizzes (Teacher Created) should be limited to 20 – 25 minutes. SGI/IPF should still occur on days when assessments are given.			
Homework	More Practice/Homework Pages (Approx. 15 minutes) (In addition to the above instructional time, outside of the math block)			