



INDIANA
DEPARTMENT *of*
EDUCATION

2026 Indiana Academic Standards **MATHEMATICS**

GRADE 6

Indiana Department of Education

100 N. Senate Ave.
Indianapolis, IN 46204



Indiana Academic Standards Context and Purpose

Introduction

The Indiana Academic Standards for Grade 6 Mathematics are the result of a process designed to identify, evaluate, synthesize, and create high-quality, rigorous learning expectations for Indiana students.

Pursuant to Indiana Code [\(IC\) 20-31-3-3](#), the Indiana Department of Education (IDOE) facilitated the formal review of the Indiana Academic Standards for K-12 Mathematics. The standards are designed to ensure that all Indiana students, upon graduation, are prepared with essential knowledge and skills needed to access employment, enrollment, or enlistment leading to service. Select standards identified as essential for mastery by the end of the grade level are indicated with gray shading and an “E.”

What are the Indiana Academic Standards and how should they be used?

The Indiana Academic Standards are designed to help educators, parents, students, and community members understand the necessary content for each grade level or course, and within each content area domain. All standards are required to be taught and should form the basis for strong core instruction for all students enrolled in the designated grade level or course. The standards identify the minimum academic content or skills that Indiana students need in order to be prepared for success after graduation, but they are not an exhaustive list.

While the Indiana Academic Standards establish key expectations for knowledge and skills and should be used as the basis for curriculum, the standards by themselves do not constitute a curriculum. It is the responsibility of the local school corporation to select and formally adopt curricular tools, including textbooks and any other supplementary materials, that align with Indiana Academic Standards. Additionally, corporation and school leaders should consider the appropriate instructional sequence of the standards as well as the length of time needed to teach each standard. Every standard has a unique place in the continuum of learning, but each standard will not require the same amount of time and attention. The standards should be used in conjunction with corresponding Indiana Assessment and Instructional Frameworks. A deep understanding of the vertical articulation of the standards will enable educators to make the best instructional decisions. These standards must also be complemented by robust, evidence-based instructional practices to support overall student development. By utilizing strategic and intentional instructional practices, other areas such as STEM and employability skills can be integrated with the content standards.

The [Effective Teaching Practices for Mathematics](#) resource summarizes eight effective mathematics teaching practices adapted from NCTM’s Principles to Actions and connects them with practical Indiana supports, including professional learning courses and instructional routines. Teachers can use this document to strengthen lesson design, promote reasoning and discourse, and use evidence of student thinking to enhance daily instruction.

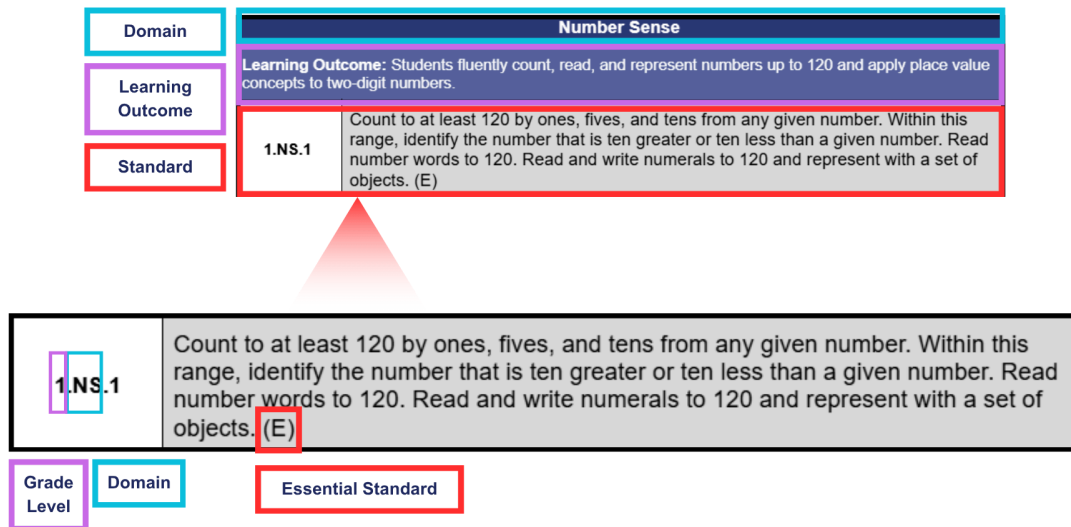
- Establish mathematics goals to focus learning.
- Implement tasks that promote reasoning and problem solving.
- Use and connect mathematical representations.
- Facilitate meaningful mathematical discourse.
- Pose purposeful questions.
- Build procedural fluency from conceptual understanding.
- Support productive struggle in learning mathematics.
- Elicit and use evidence of student thinking.

Indiana Academic Standards for Mathematics Structure

Domain: a broad content area within the Indiana Academic Standards that organizes related knowledge and skills into coherent instructional categories.

Learning Outcome: the specific, measurable demonstration of what a student knows or can do after instruction aligned to Indiana Academic Standards.

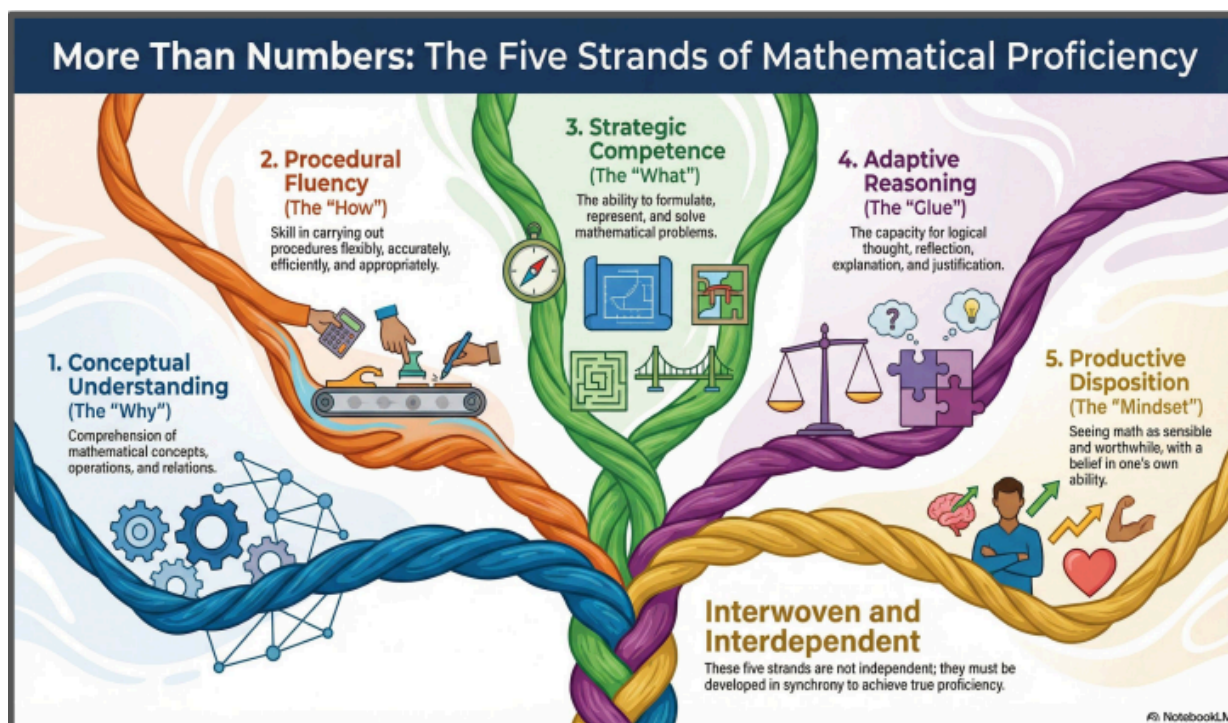
Standard: a required, minimum expectation for the knowledge and skills students must learn in a given grade level or course to ensure readiness for employment, enrollment, or enlistment leading to service.



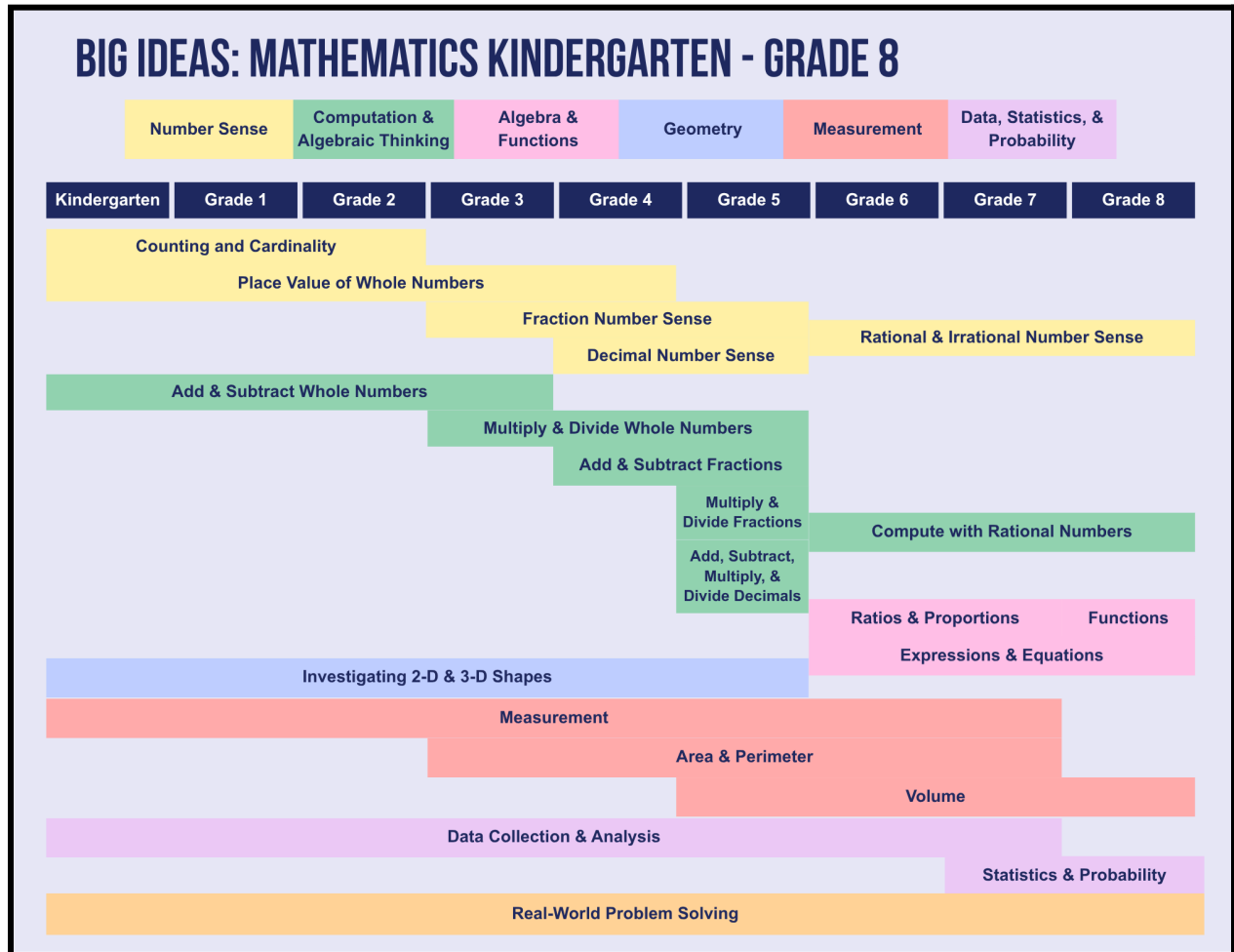
Building Coherent Mathematics Instruction

Strands of Mathematical Proficiency: [The Five Strands of Mathematical Proficiency](#), identified by the National Research Council, describe the core capabilities students need to deeply understand and use mathematics. When these strands are intentionally woven into daily instruction and assessment, educators support classrooms where students not only learn mathematical content but also develop the confidence and skill to apply it with purpose.

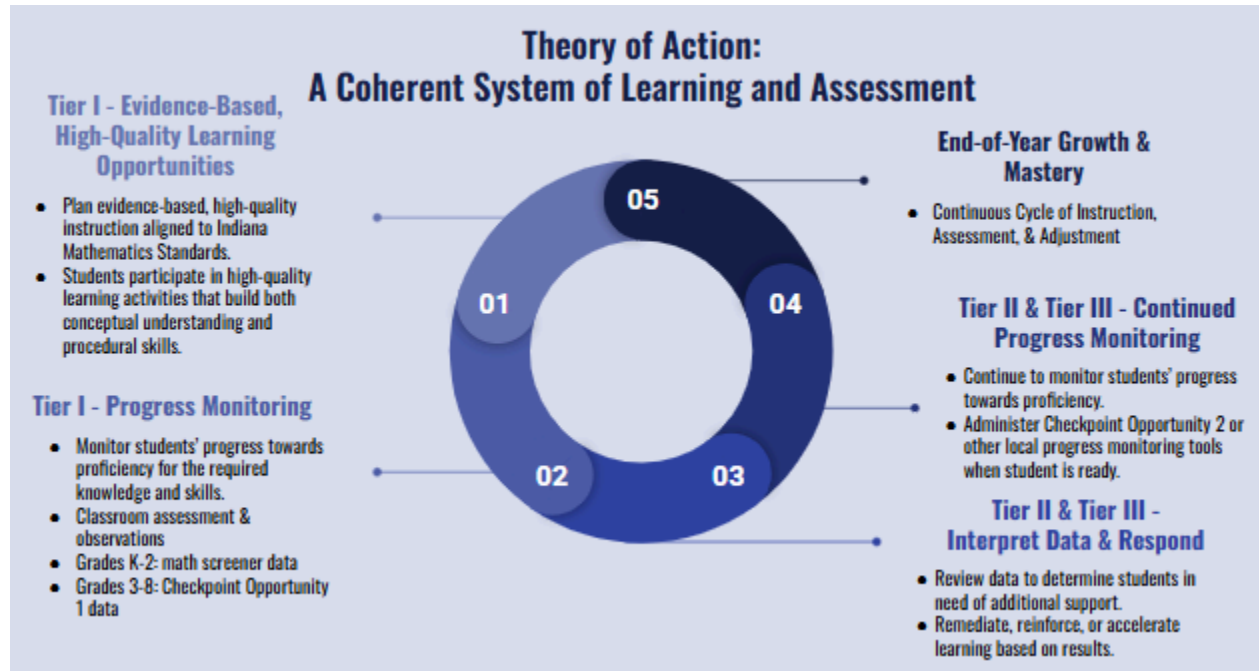
Rather than functioning as separate skills, the strands operate together as an interconnected system. Each strand strengthens and reinforces the others, creating a comprehensive foundation that helps students make sense of mathematics, flexibly use what they know, reason through problems, and persist when learning becomes challenging. When braided together, the Five Strands form a durable structure that supports students' long-term mathematical growth and success.



Big Ideas: The mapping below illustrates the big ideas of mathematics from Kindergarten through Grade 8, demonstrating how concepts and skills develop and connect across grade levels. Each domain is shown as a progression, highlighting how understanding deepens, extends, and becomes more rigorous over time. By following the pathways of each idea, it becomes clear how early concepts lay the groundwork for more complex topics in later grades, as well as when new ideas are introduced and how they evolve. This mapping supports a clearer understanding of the structure and coherence of mathematical learning, showing how big ideas build upon one another to form a continuous and connected progression.



Indiana's Theory of Action: A Coherent System of Learning and Assessment



IDOE has intentionally built a coherent statewide system for mathematics learning that connects the Indiana Academic Standards for Mathematics, the Universal Mathematics Screener for grades K–2, the ILEARN Through-Year Assessment for grades 3–8, and Indiana's Tiered System of Supports for Mathematics. Across all grade bands, the theory of action includes the same key principles:

- Strong mathematics learning begins with high-quality, evidence-based core instruction.
- Continuous progress monitoring pinpoints each student's progress along a standards-based learning progression.
- Students move fluidly in and out of additional support opportunities until they demonstrate proficiency with rigorous, grade-level content.

The Indiana Academic Standards for Mathematics serve as the foundation of this system. Two essential IDOE resources bring those standards to life in complementary ways. The [Mathematics Instructional Frameworks](#) translate the standards into teachable learning opportunities by unpacking each standard through evidence and clarification statements, academic vocabulary, common misconceptions, prior-knowledge skills, universal supports, and a skill-based breakdown of the Performance Level Descriptors (PLDs). In parallel, the [Indiana Assessment Framework for Mathematics](#) organizes the assessment side of the standards, providing test blueprints, item specifications, and PLDs, to ensure that instruction and assessment measure the same coherent progression of skills.

Throughout the year, this system operates as a continuous cycle of instruction, assessment, targeted intervention, and ongoing progress monitoring. In grades K–2, this cycle builds foundational number sense and computation concepts essential for later learning. In grades 3–8, it supports measurable growth toward mastery of grade-level standards and culminating proficiency on the ILEARN Summative Assessment.

The through-line across K–8 remains flexible and responsive. Progress monitoring is frequent, instruction adjusts to what the data reveal, and students move in and out of tiered supports as their needs evolve, always with access to rigorous, grade-level mathematics.

Acknowledgments

IDOE appreciates the time, dedication, and expertise offered by Indiana’s K-12 educators, higher education professors, representatives from business and industry, families, and other stakeholders who contributed to the development of the Indiana Academic Standards. We wish to especially acknowledge the committee members, as well as participants in the public comment period, who dedicated many hours to the review and evaluation of these standards designed to prepare Indiana students for success after graduation.

Mathematics Process Standards

The mathematics process standards describe the ways students engage with mathematics content that is essential in guiding them to develop conceptual understanding, synthesize skills, and apply their learning in meaningful contexts. These standards are not isolated skills, but habits of mind and practices that empower students to reason, communicate, and solve problems across all areas of mathematics. They also support students in becoming confident, flexible thinkers who can transfer their mathematical understanding to new situations and disciplines.

IDOE provides detailed guidance on the Process Standards and their role in mathematics instruction to further support educators and families. Please refer to the [Mathematics Process Standards: Grades K-12](#) document for a comprehensive overview. Additionally, IDOE outlined the continuum of student proficiency in the [ILEARN PLD Map: Math Processes Grades 3-8](#), helping educators understand and support growth from foundational skills to advanced application.

Process Standard 1: Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway, rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" and "Is my answer reasonable?" They understand the approaches of others to solving complex problems and identify correspondences between different approaches. Mathematically proficient students understand how mathematical ideas interconnect and build on one another to produce a coherent whole.

Process Standard 2: Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Process Standard 3: Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They analyze situations by breaking them into cases and recognize and use counterexamples. They organize their mathematical thinking, justify their conclusions and communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data

arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. They justify whether a given statement is always true, sometimes, or never. Mathematically proficient students participate and collaborate in a mathematics community. They listen to or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

Process Standard 4: Model with mathematics.

Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts, and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

Process Standard 5: Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Mathematically proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. Mathematically proficient students identify relevant external mathematical resources, such as digital content, and use them to pose or solve problems. They use technological tools to explore and deepen their understanding of concepts and to support the development of learning mathematics. They use technology to contribute to concept development, simulation, representation, reasoning, communication, and problem solving.

Process Standard 6: Attend to precision.

Mathematically proficient students communicate precisely to others. They use clear definitions, including correct mathematical language, in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They express solutions clearly and logically by using the appropriate mathematical terms and notation. They specify units of measure and label axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently and check the validity of their results in the context of the problem. They express numerical answers with a degree of precision appropriate for the problem context.

Process Standard 7: Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. They step back for an overview and shift perspective. They recognize and use properties of operations and equality. They organize and classify geometric shapes based on their attributes. They see expressions, equations, and geometric figures as single objects or as being composed of several objects.

Process Standard 8: Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated and look for general methods and shortcuts. They notice regularity in mathematical problems and their work to create a rule or formula. Mathematically proficient students maintain oversight of the process, while attending to the details as they solve a problem. They continually evaluate the reasonableness of their intermediate results.

Grade 6 Mathematics

Standards identified as essential for mastery by the end of the grade level are indicated with gray shading and an “E.” The learning outcome statement for each domain immediately precedes each set of standards.

Number Sense	
Learning Outcome: Students use rational numbers to model, compare, order and plot real-world quantities. Students fluently compute with all positive numbers, including fractions, decimals, and exponents, applying the order of operations and properties of operations to evaluate, create, and justify equivalent expressions. Students determine the greatest common factor and least common multiple in order to express sums as $a(b+c)$.	
6.NS.1	Use positive and negative numbers to represent and compare quantities in real-world contexts, explaining the meaning of 0 in each situation. (E)
6.NS.2	Explain how opposite signs of numbers indicate locations on opposite sides of 0 on the number line; identify the opposite of the opposite of a number.
6.NS.3	Compare and order rational numbers and plot them on a number line. Write, interpret, and explain statements of order for rational numbers in real-world contexts.
6.NS.4	Fluently add, subtract, multiply, and divide positive fractions, mixed numbers, and decimals to solve mathematical and real-world problems. (E)
6.NS.5	Apply the order of operations and properties of operations (i.e., identity property, inverse property, commutative properties of addition and multiplication, associative properties of addition and multiplication, and distributive property) to evaluate numerical expressions with positive whole numbers, fractions, and decimals, including those using grouping symbols, such as parentheses, and involving whole number exponents. (E)
6.NS.6	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. Use the distributive property to express a sum of two whole numbers from 1 to 100 with a common factor as $a(b+c)$ where b and c have no common factor.

6.NS.7	Apply the properties of operations (i.e., identity property, inverse property, commutative properties of addition and multiplication, associative properties of addition and multiplication, and distributive property) to create equivalent linear expressions (e.g., combining like terms, expanding expressions) and to justify whether two linear expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them. (E)
6.NS.8	Explain the meaning of exponents and evaluate positive whole numbers, fractions, and decimals with whole number exponents.
Ratios and Proportional Reasoning	
Learning Outcome: Students convert fractions, decimals, and percents without a calculator, explain terminating/repeating decimals, and compute/interpret unit rates ("per 1") in context. Students use tables, graphs, and models to compare equivalent ratios, solve real-world problems, and represent covarying quantities with variables, writing equations for dependent/independent quantities and analyzing how graphs and tables relate to those equations.	
6.RP.1	Convert between any two representations of fractions, decimals, and percents without the use of a calculator. Convert a fraction to a decimal; explain that the decimal form terminates in 0s or eventually repeats. (E)
6.RP.2	Apply and extend ratio relationships to calculate and interpret unit rates. a. Calculate and interpret unit rates associated with ratio relationships, expressing the rate as an amount "per 1" of a given quantity. b. Use terms such as "for each," "for every 1," or "per one" to describe and reason about unit rates in real-world contexts. c. Solve problems by computing unit rates from given ratios and explaining what the unit rate means in context.
6.RP.3	Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare two situations with different ratios.
6.RP.4	Solve real-world and other mathematical problems involving rates and ratios using models and strategies such as reasoning about tables of equivalent ratios, tape diagrams, and double number line diagrams. (E)
6.RP.5	Use variables to represent two quantities that vary together in an equivalent ratio in a real-world problem; write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (E)

Algebra and Functions	
Learning Outcome: Students write and evaluate multivariable expressions and use substitution to determine which values satisfy given equations or inequalities. Students fluently solve one-step equations with nonnegative rational numbers; represent and graph inequality solution sets (recognizing infinitely many solutions); and use rational coordinates and absolute value on the coordinate plane to solve problems, including horizontal/vertical distances.	
6.AF.1	Define and use multiple variables when writing expressions to represent real-world and other mathematical problems, and evaluate them for given values. (E)
6.AF.2	Demonstrate which values from a specified set, if any, make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true. (E)
6.AF.3	Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p , q , and x are all nonnegative rational numbers. Represent real-world problems using equations of these forms and solve such problems. (E)
6.AF.4	Write an inequality of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$, where c is a rational number, to represent a constraint or condition in a real-world or other mathematical problem. Explain that inequalities have infinitely many solutions and how to represent solutions on a number line diagram.
6.AF.5	Solve real-world and other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (E)
Geometry and Measurement	
Learning Outcome: Students convert between Customary and metric units using given conversion factors to solve real-world problems, and apply the sums of interior angles of triangles and quadrilaterals to reason and solve geometric tasks. Students find areas of complex polygonal figures by composing/decomposing into simple shapes and determine volumes of right rectangular prisms with fractional edge lengths using unit cubes and the formulas $V = lwh$ and $V = Bh$ in real-world and mathematical contexts.	
6.GM.1	Convert between measurement systems (Customary to metric and metric to Customary) given the conversion factors, and use these conversions in solving real-world problems.
6.GM.2	Apply the sums of interior angles of triangles and quadrilaterals to solve real-world and mathematical problems.
6.GM.3	Find the area of complex shapes composed of polygons by composing or decomposing into simple shapes; apply this technique to solve real-world and other mathematical problems.
6.GM.4	Find the volume of a right rectangular prism with fractional edge lengths using unit cubes of the appropriate unit fraction edge lengths (e.g., using technology or concrete materials) and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths to solve real-world and other mathematical problems. (E)

Data Analysis and Statistics	
Learning Outcome: Students will formulate statistical questions, collect and organize data using appropriate tools and technology, and represent the data with line plots, histograms, or box plots to identify key features, overall patterns, and notable deviations. They will summarize numerical data sets by determining the mean or median, analyze the impact of outliers, and justify which measure of center best represents the data in context.	
6.DS.1	Interpret and select graphical representations of numerical data, including line plots, histograms, and box plots, by describing the key features of each graph. Describe overall patterns and any striking deviations from those patterns, and explain how these relate to the context in which the data were collected.
6.DS.2	Formulate a statistical question. Collect and organize data, including the use of technology when appropriate. Report the number of observations and clearly describe the attribute under investigation by explaining what is being measured, how it is measured, and the units of measurement. Use the organized data to construct an appropriate graphical representation, selecting from a line plot, histogram, or box plot. (E)
6.DS.3	Summarize numerical data sets by determining and calculating the appropriate measure of center, selecting either the mean or the median. Evaluate the influence of outliers on these measures and determine which measure of center best represents the data. Justify the selected measure of center by relating it to the context in which the data were collected. (E)