



INDIANA
DEPARTMENT *of*
EDUCATION

2026 Indiana Academic Standards **MATHEMATICS**

GRADE 5

Indiana Department of Education

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Indianapolis, IN 46204



Indiana Academic Standards Context and Purpose

Introduction

The Indiana Academic Standards for Grade 5 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.

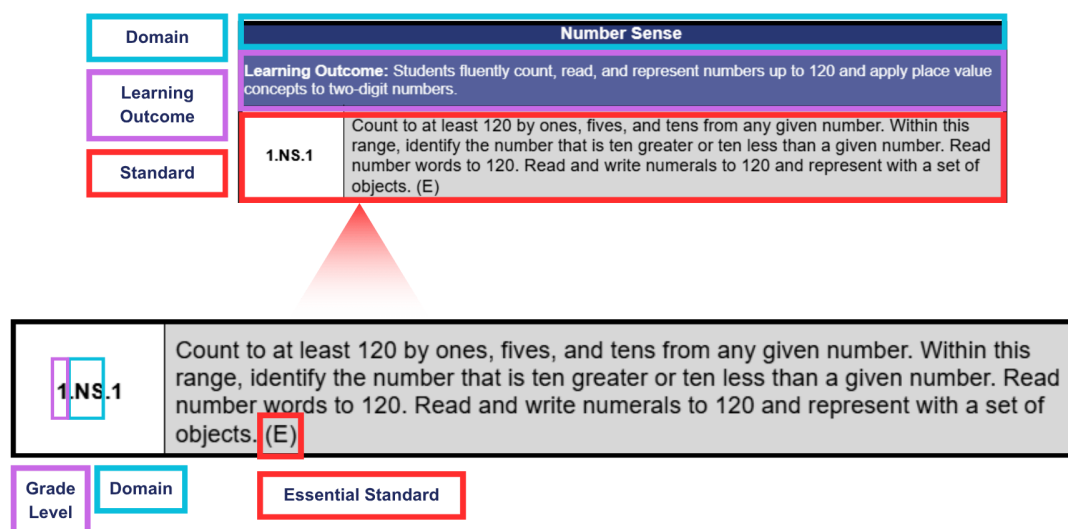
- Establish mathematics goals to focus learning.
- Implement tasks that promote reasoning and problem solving.
- Use and connect mathematical representations.
- Facilitate meaningful mathematical discourse.
- Pose purposeful questions.
- Build procedural fluency from conceptual understanding.
- Support 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.

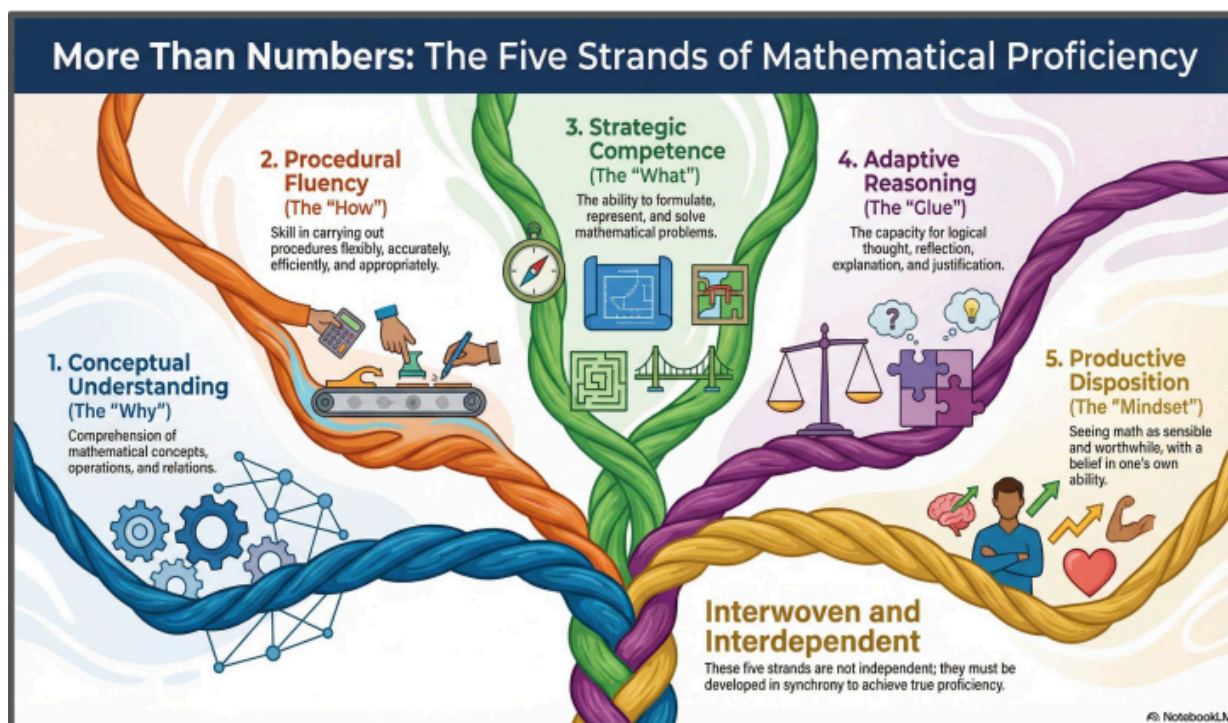
Standard: a required, minimum expectation for the knowledge and skills students must learn in a given grade level or course to ensure readiness for employment, enrollment, or enlistment leading to service.



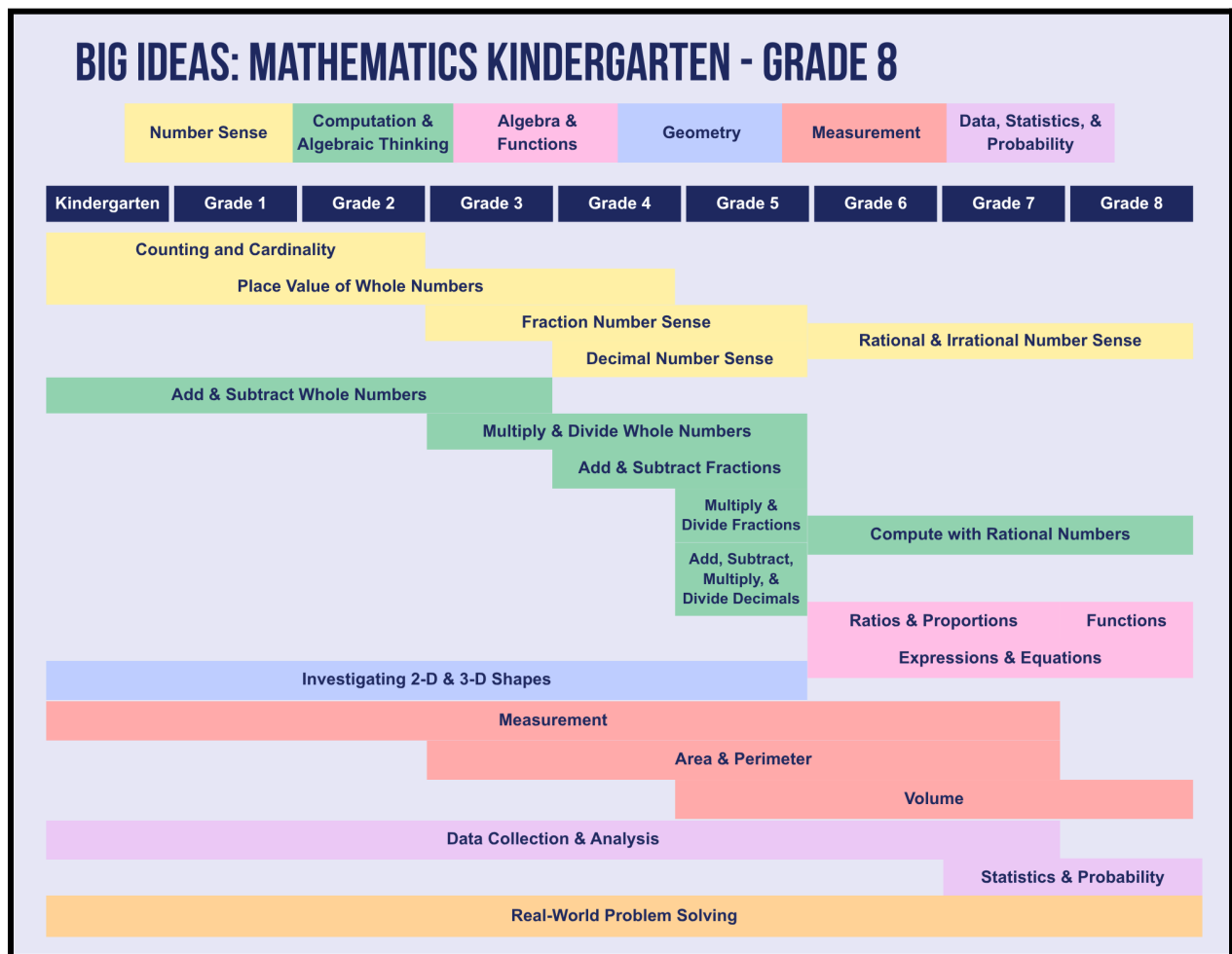
Building Coherent Mathematics Instruction

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.

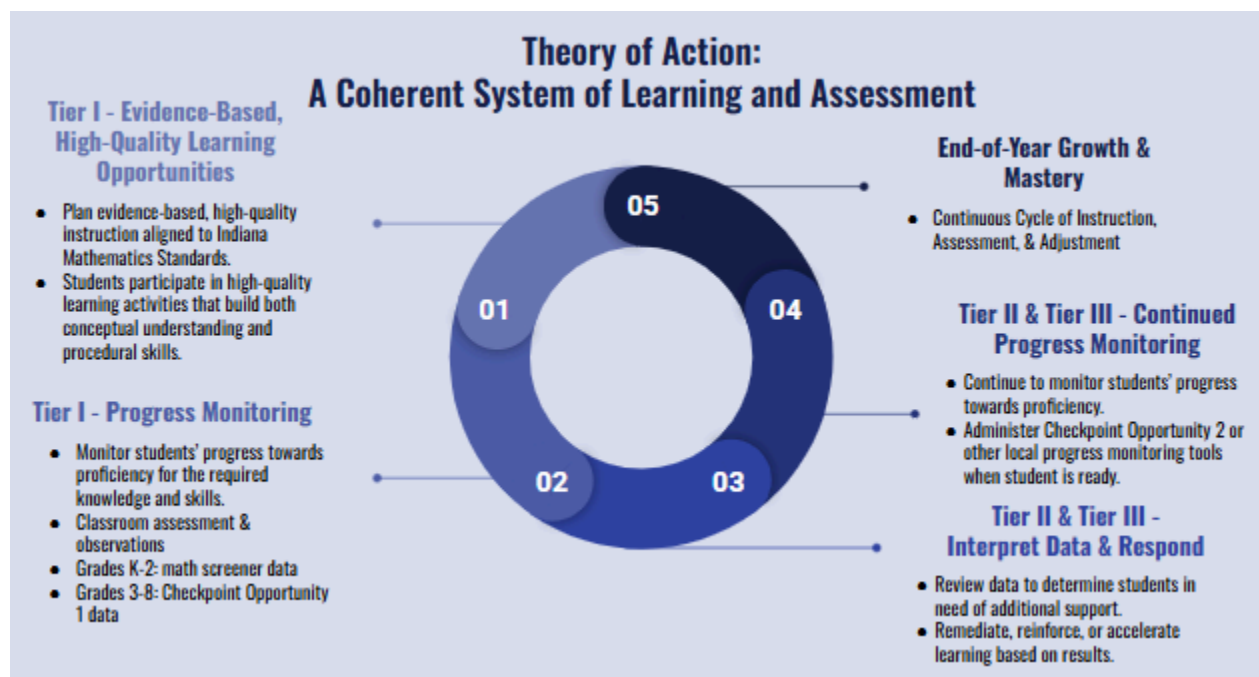
Rather than functioning as separate skills, the strands operate together as an interconnected system. Each strand strengthens and reinforces the others, creating a comprehensive foundation that helps students make sense of mathematics, flexibly use what they know, reason through problems, and persist 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 5 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 explore place value through representing powers of 10 as exponents, modeling percents as parts of 100, and comparing and ordering fractions, mixed numbers, and decimals to the thousandth.	
5.NS.1	Use a number line to compare and order fractions, mixed numbers, and decimals to thousandths. Write the results using $>$, $=$, and $<$ symbols. (E)
5.NS.2	Explain different interpretations of fractions, including as parts of a whole, parts of a set, and division of whole numbers by whole numbers.
5.NS.3	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
5.NS.4	Model percents as parts of 100 using pictures or diagrams and identify the equivalent fraction.
Computation and Algebraic Thinking	
Learning Outcome: Students apply concepts and strategies of multiplication and division to solve real-world problems. Students add and subtract unlike fractions and use visual fraction models to multiply and divide fractions and whole numbers. Students apply conceptual models and strategies to all operations with fractions and decimals to solve real-world problems and represent real-world situations within the first quadrant of the coordinate plane.	
5.CA.1	Calculate whole-number quotients and remainders with up to four-digit dividends and two-digit divisors using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Describe the strategy and assess the reasonableness of the solution. (E)

5.CA.2	Solve real-world problems involving multiplication and division of whole numbers by using equations to represent the problem. In division problems that involve a remainder, explain how the remainder affects the solution to the problem. Describe the strategy and assess the reasonableness of the solution. (E)
5.CA.3	Add and subtract fractions and mixed numbers with unlike denominators using strategies or the standard algorithm.
5.CA.4	Solve real-world addition and subtraction problems with fractions referring to the same whole, including unlike denominators, using visual models and equations. Use benchmark fractions and fraction number sense to estimate mentally and assess the reasonableness of the solution. (E)
5.CA.5	Use visual fraction models to multiply: • a fraction by a fraction; • a fraction by a mixed number; • a mixed number by a mixed number; and • a whole number by a mixed number. (E)
5.CA.6	Use visual fraction models to divide: • a fraction by a fraction; • a fraction by a whole number; • a whole number by a fraction; and • whole numbers leading to quotients in the form of fractions or mixed numbers. (E)
5.CA.7	Solve real-world problems using visual fraction models and equations to represent the problem, involving multiplication of: • a fraction by a fraction; • a fraction by a mixed number; • a mixed number by a mixed number; and • a whole number by a mixed number. (E)
5.CA.8	Solve real-world problems using visual fraction models and equations to represent the problem, involving division of: • a fraction by a fraction; • a fraction by a whole number; • a whole number by a fraction; and • whole numbers leading to quotients in the form of fractions or mixed numbers. (E)
5.CA.9	Add, subtract, multiply, and divide decimals to hundredths, using models or drawings and strategies based on place value or the properties of operations. Describe the strategy and assess the reasonableness of the solution.
5.CA.10	Solve real-world problems involving addition, subtraction, multiplication, and division with decimals to hundredths including problems that involve money in decimal notation (e.g., by using equations, models or drawings, and strategies based on place value or properties of operations to represent the problem). (E)

5.CA.11	Evaluate expressions with parentheses or brackets involving whole numbers using the commutative properties of addition and multiplication, associative properties of addition and multiplication, and distributive property.
5.CA.12	Represent real-world problems and equations by graphing ordered pairs in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
Geometry	
Learning Outcome: Students use appropriate tools to investigate attributes of triangles and circles.	
5.G.1	Identify, describe, and draw triangles (right, acute, obtuse) and circles using appropriate tools (e.g., ruler or straightedge, compass, and technology). Define and model the relationship between radius and diameter.
Measurement	
Learning Outcome: Students investigate the volume of rectangular prisms and solve real-world problems through the development and application of area formulas for rectangles, triangles, parallelograms, and trapezoids. Students investigate and convert measurements within the Customary and metric measurement systems.	
5.M.1	Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real-world problems.
5.M.2	Calculate the area of a rectangle with fractional side lengths by modeling with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
5.M.3	Develop and use formulas for the area of triangles, parallelograms, and trapezoids. Solve real-world and other mathematical problems that involve perimeter and area of triangles, parallelograms, and trapezoids, using appropriate units for measures. (E)
5.M.4	Determine the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths or by multiplying the height by the area of the base. (E)
5.M.5	Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for right rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths to solve real-world problems and other mathematical problems. (E)

Data Analysis	
Learning Outcome: Students collect, organize, and graph categorical and numerical data in multiple manners. Students formulate questions that can be addressed with the data and solve multi-step problems with the data using grade-level computation and comparison strategies. Students calculate measures of central tendency and analyze data sets to determine which measure of central tendency appropriately describes the distribution of data.	
5.DA.1	Formulate questions that can be addressed with categorical and numerical data and make predictions about the data. Collect, organize, and graph data from observations, surveys, and experiments using line plots with fractional intervals, frequency tables, bar graphs, or pie charts that appropriately represent the data set. (E)
5.DA.2	Calculate measures of central tendency (mean, median, and mode) to describe a data set. Analyze data sets to determine which measure of central tendency appropriately describes the distribution of data. (E)