Indiana Mathematics

Grade 5

Adopted 2023

Mathematics Process Standards

1. **Make sense of problems and persevere in solving them.** 5.PS.1
2. **Reason abstractly and quantitatively.** 5.PS.2
3. **Construct viable arguments and critique the reasoning of others.** 5.PS.3
4. **Model with mathematics.** 5.PS.4
5. **Use appropriate tools strategically.** 5.PS.5
6. **Attend to precision.** 5.PS.6
7. **Look for and make use of structure.** 5.PS.7
8. **Look for and express regularity in repeated reasoning.** 5.PS.8

Number Sense

NS. 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. 5.NS.1
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.2
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.3
4. Model percents as parts of 100 using pictures or diagrams and identify the equivalent fraction. 5.NS.4

Computation and Algebraic Thinking

CA. 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 decimals to solve real-world problems and represent real-world situations within the first quadrant of the coordinate plane. 5.CA

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1. Find 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 explain the reasoning used. 5.CA.1
2. Solve real-world problems involving multiplication and division of whole numbers (e.g., by using equations to represent the problem). In division problems that involve a remainder, explain how the remainder affects the solution to the problem. 5.CA.2
3. Add and subtract fractions and mixed numbers with unlike denominators using strategies or the standard algorithm. 5.CA.3
4. Solve real-world problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (e.g., by using visual fraction models and equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess whether the answer is reasonable. 5.CA.4
5. Use visual fraction models to multiply a fraction by a fraction or a whole number. 5.CA.5
6. Use visual fraction models and numbers to divide a fraction by a fraction or a whole number. 5.CA.6
7. Solve real-world problems involving multiplication of fractions, including mixed numbers (e.g., by using visual fraction models and equations to represent the problem). 5.CA.7
8. Solve real-world problems involving division of fractions and mixed numbers (e.g., by using visual fraction models and equations to represent the problem). 5.CA.8
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 explain the reasoning. 5.CA.9
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). 5.CA.10
11. 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. 5.CA.11

Geometry

G. 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. 5.G.1

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Measurement

M. 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.1
2. Find 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.2
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. 5.M.3
4. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths or multiplying the height by the area of the base. 5.M.4
5. Apply the formulas V = l × w × h and V = B × 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. 5.M.5

Data Analysis

DA. Students create questions appropriate to the data and answer the questions using multiple representations. 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, histograms, or other graphical representations that appropriately represent the data set. 5.DA.1
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. 5.DA.2