Indiana Mathematics

Grade 4

Adopted 2023

Mathematics Process Standards

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

Number Sense

NS. Students represent and round multi-digit numbers. Students model, compare, and generate equivalent fractions, mixed numbers, and decimal numbers to the tenths and hundredths. 4.NS

1. Read and write whole numbers up to 1,000,000. Use words, models, standard form, and expanded form to represent and show equivalent forms of whole numbers up to 1,000,000. 4.NS.1
2. Model mixed numbers and improper fractions using visual fraction models such as number lines and area models. Use a visual fraction model to show the equivalency between whole numbers and whole numbers as fractions. 4.NS.2
3. Use fraction models to represent two equivalent fractions with attention to how the number and size of the parts differ even though the fractions themselves are the same size. Use this principle to generate equivalent fractions. 4.NS.3
4. Compare two fractions with different numerators and different denominators (e.g., by creating common denominators or numerators, or by comparing to a benchmark, such as 0, ½, and 1). Explain why comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols > , = , or < , and justify the conclusions (e.g., by using a visual fraction model). 4.NS.4

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5. Write tenths and hundredths in decimal and fraction notations. Use words, models, standard form, and expanded form to represent decimal numbers to hundredths. Mentally calculate fraction and decimal equivalents for halves and fourths (e.g., ½ = 0.5 = 0.50, 7/4 = 1¾ = 1.75). 4.NS.5
6. Compare two decimals to hundredths by reasoning about their size based on the same whole. Record the results of comparisons with the symbols > , = , or < , and justify the conclusions (e.g., by using a visual model). 4.NS.6
7. Use place value understanding to round multi-digit whole numbers to any given place value. 4.NS.7

Computation and Algebraic Thinking

CA. Students solve real-world problems using place value strategies and properties of multiplication and division with limitations. Students compose (addition) and decompose (subtraction) non-unit fractions and mixed numbers using models and strategies, applying these concepts to real-world situations. Students investigate the relationship between two given sets of numbers and generate number patterns based upon given rules. 4.CA

1. Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Describe the strategy and explain the reasoning. 4.CA.1
2. Find whole-number quotients and remainders with up to four-digit dividends and one-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. 4.CA.2
3. Show how the order in which two numbers are multiplied (commutative property) and how numbers are grouped in multiplication (associative property) will not change the product. Use these properties to show that numbers can be multiplied in any order. Investigate and apply the distributive property. 4.CA.3
4. Investigate the mathematical relationship between factors and multiples for whole numbers from 1-100, including the set of factors and multiples for given numbers. Identify sets of factors and multiples for any given whole number up to 100. 4.CA.4
5. Solve real-world problems with whole numbers involving multiplicative comparison (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem), distinguishing multiplicative comparison from additive comparison. 4.CA.5
6. Add and subtract fractions with common denominators using visual fraction models. Decompose non-unit fractions to represent them as iterations of unit fractions. 4.CA.6
7. Add and subtract mixed numbers with common denominators (e.g., by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction). 4.CA.7
8. Solve real-world problems involving addition and subtraction of fractions referring to the same whole and having common denominators (e.g., by using visual fraction models and equations to represent the problem). 4.CA.8

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9. Describe the relationship between two terms and use it to find a second number when a first number is given. Generate a number pattern that follows a given rule. 4.CA.9

Geometry

G. Students utilize appropriate tools to identify, describe, and draw parallelograms, rhombuses, and trapezoids in addition to classifying two-dimensional shapes. 4.G

1. Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge, and technology). 4.G.1
2. Identify, describe, and draw rays, angles (right, acute, obtuse), and perpendicular and parallel lines using appropriate tools (e.g., ruler, straightedge, and technology). Identify these in two-dimensional figures. 4.G.2
3. Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or right, acute, or obtuse angles. 4.G.3

Measurement

M. Students solve real-world problems involving distance, intervals of time, volumes, masses of objects, and money by applying computation strategies, precise measurement skills, and relationships between systems of measurement. Students continue to apply the concept of area and perimeter to complex shapes to identify solutions. 4.M

1. Measure length to the nearest quarter-inch, eighth-inch, and millimeter. 4.M.1
2. Within given measurement systems, convert larger units to smaller units, including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec., and use these conversions to solve real-world problems. 4.M.2
3. Use the four operations to solve real-world problems involving distances, intervals of time, volumes, masses of objects, and money. Include addition and subtraction problems involving simple fractions and problems that require expressing measurements given in a larger unit in terms of a smaller unit. 4.M.3
4. Apply the area and perimeter formulas for rectangles to solve real-world and other mathematical problems. Investigate the area of complex shapes composed of rectangles by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts; apply this technique to solve real-world problems and other mathematical problems. 4.M.4

Data Analysis

DA. Students collect and ask questions of the data. 4.DA

1. Formulate questions that can be addressed with data. Collect, organize, and graph data from observations, surveys, and experiments using line plots with whole number intervals, single- and scaled bar graphs, and frequency tables. Solve real-world problems by analyzing and interpreting the data using grade-level computation and comparison strategies. 4.DA.1
2. Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, 1/8). Solve problems involving addition and subtraction of fractions by using data displayed in line plots. 4.DA.2