Content Connectors aligned to the
Indiana Academic Standards
Mathematics Grade 4

Content Connectors (CCs) identify the most salient grade-level, core academic content in math found in the Indiana Academic Standards. CCs focus on the core content, knowledge and skills needed at each grade to promote success at the next, and identify priorities in each content area to guide the instruction for students in this population and for the alternate assessment.

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Number Sense	
MA.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.	MA.4.NS.1.a.1: Read, write and demonstrate (show) whole numbers up to 500.
MA.4.NS.2: Compare two whole numbers up to 1,000,000 using >, =, and < symbols.	MA.4.NS.2.a.1: Compare two whole numbers up to 500 using symbols (>, =, and <) and words (greater than, equal to, or less than).
MA.4.NS.3: Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Name and write mixed numbers using objects or pictures. Name and write mixed numbers as improper fractions using objects or pictures.	MA.4.NS.3.a.1: Express a whole number as a fraction using a model. [Limit denominators to 2, 3, 4, and 6.
MA.4.NS.4: Explain why a fraction, a/b, is equivalent to a fraction, (n × a)/(n × b), by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use the principle to recognize and generate equivalent fractions. [In grade 4, limit denominators of fractions to 2, 3, 4, 5, 6, 8, 10, 25, 100.]	MA.4.NS.4.a.1: Using a model, show equivalent fractions, for fractions up 1/10.
MA.4.NS.5: 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, 1/2, and 1). Recognize 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).	MA.4.NS.5.a.1: Use symbols (=, <, or >) and words to compare 2 fractions (fractions with the same denominator of 10 or less).
MA.4.NS.6: Write tenths and hundredths in decimal and fraction notations. Use words, models, standard form and expanded form to represent decimal numbers to hundredths. Know the fraction and decimal equivalents for halves and fourths (e.g., 1/2 = 0.5 = 0.50, 7/4 = 1 3/4 = 1.75).	MA.4.NS.6.a.1: Select decimals to the tenths place when given a fraction.
MA.4.NS.7: 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).	MA.4.NS.7.a.1: Compare two decimals to the tenths place with a value of less than 1.
MA.4.NS.8: Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number.	MA.4.NS.8.a.1: Identify two numbers that when multiplied together create a certain product (multiples of 5, up to 100).
MA.4.NS.9: Use place value understanding to round multi-digit whole	MA.4.NS.9.a.1: Use place value to round to any place (i.e., ones, tens,

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numbers to any given place value.	hundreds, thousands); up to 1000.
Computation	
MA.4.C.1: Add and subtract multi-digit whole numbers fluently using a standard algorithmic approach.	MA.4.C.1.a.1: Add and subtract multi-digit whole numbers up to 1,000 with regrouping.
MA.4.C.2: 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.	MA.4.C.2.a.1: Relate multiplication to skip counting to enable to students to solve multiplication problems up to two digits by 0, 1, 2, 5 and 10.
MA.4.C.3: 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.	MA.4.C.3.a.1: Divide a set of objects into smaller sets of equal number. [Limit to 50 items or fewer.]
MA.4.C.4: Multiply fluently within 100.	MA.4.C.4.a.1: Multiplying whole numbers within 100.
MA.4.C.5: Add and subtract fractions with common denominators. Decompose a fraction into a sum of fractions with common denominators. Understand addition and subtraction of fractions as combining and separating parts referring to the same whole.	MA.4.C.5.a.1: Using a model, represent the concept of adding and subtracting fractions (e.g., ¾ = ¼ + ¼ + ¼).
MA.4.C.6: 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).	MA.4.C.6.a.1: Using a model, represent the concept of adding and subtracting mixed numbers with common denominators (e.g., 1 + 1/2 = 1 1/2).
MA.4.C.7: Show how to 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. Understand and use the distributive property.	MA.4.C.7.a.1: Using models, demonstrate understanding of the commutative property using numbers less than 5.
Algebraic Thinking	
MA.4.AT.1: Solve real-world problems involving addition and subtraction of multi-digit whole numbers (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem).	MA.4.AT.1.a.1: Evaluate one- or two-step word problems involving addition and/or subtraction.
MA.4.AT.2: Recognize and apply the relationships between addition and multiplication, between subtraction and division, and the inverse relationship between multiplication and division to solve real-world and other mathematical problems.	MA.4.AT.2.a.1: Recognize the relationship between addition and multiplication.

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MA.4.AT.3: Interpret a multiplication equation as a comparison (e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7, and 7 times as many as 5). Represent verbal statements of multiplicative comparisons as multiplication equations.	MA.4.AT.3.a.1: Use objects to model multiplication situations involving up to 5 groups with up to 5 objects in each group and interpret the results.
MA.4.AT.4: 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. [In grade 4, division problems should not include a remainder.]	MA.4.AT.4.a.1: Determine how many objects go into each group when given the total number of objects and the number of groups where the number in each group or number of groups is not greater than 5.
MA.4.AT.5: 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).	MA.4.AT.5.a.1: Solve a real world problem using a model to represent the concept of adding and subtracting fractions (e.g., ¾ = ¼ + ¼ + ¼).
MA.4.AT.6: Understand that an equation, such as y = 3x + 5, is a rule to describe a relationship between two variables and can be used to find a second number when a first number is given. Generate a number pattern that follows a given rule.	MA.4.AT.6.a.1: Understand that a variable in an equation is representing a number.
Geometry	
MA.4.G.1: Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).	MA.4.G.1.a.1: Using models and representations, identify the following shapes: parallelograms, rhombuses, and trapezoids.
MA.4.G.2: Recognize and draw lines of symmetry in two-dimensional figures. Identify figures that have lines of symmetry.	MA.4.G.2.a.1: Recognize a line of symmetry in a figure.
MA.4.G.3: Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint.	MA.4.G.3.a.1: Recognize an angle in two-dimensional shape.
MA.4.G.4: 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.	MA.4.G.4.a.1: Identify parallel and perpendicular lines.
MA.4.G.5: Classify triangles and quadrilaterals based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles (right, acute, obtuse).	MA.4.G.5.a.1: Classify shapes based on attributes (angles, parallel and perpendicular lines).
MA.4.G.6: Identify, describe, and draw parallelograms, rhombuses, and trapezoids using appropriate tools (e.g., ruler, straightedge and technology).	MA.4.G.1.a.1: Using models and representations, identify the following shapes: parallelograms, rhombuses, and trapezoids.
Measurement	
MA.4.M.1: Measure length to the nearest quarter-inch, eighth-inch, and millimeter.	MA.4.M.1.a.1: Measure length to nearest quarter-inch.

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MA.4.M.2: Know relative sizes of measurement units within one system of units, including km, m, cm; kg, g; lb., oz.; l, ml; hr., min, sec. Express measurements in a larger unit in terms of a smaller unit within a single system of measurement. Record measurement equivalents in a two-column table.	MA.4.M.2.a.1: Identify the appropriate units of measurement for different purposes in a real life context (e.g., measure a wall using feet, not inches).
MA.4.M.3: Use the four operations (addition, subtraction, multiplication and division) 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.	MA.4.M.3.a.1: S Tell time to the quarter hour from analog clocks. Solve real-world problems involving intervals of time to the half-hour using pictures or models.
MA.4.M.4: Apply the area and perimeter formulas for rectangles to solve real-world problems and other mathematical problems involving shapes. Recognize area as additive and find 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 involving shapes.	MA.4.M.4.a.1: Solve real-world problems using area.
MA.4.M.5: Understand that an angle is measured with reference to a circle, with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. Understand an angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure other angles. Understand an angle that turns through n one-degree angles is said to have an angle measure of n degrees.	MA.4.M.5.a.1: Recognize an angle in two-dimensional figures.
MA.4.M.6: Measure angles in whole-number degrees using appropriate tools. Sketch angles of specified measure.	MA.4.M.6.a.1: Select appropriate tool for measurement: angles.
Data Analysis	
MA.4.DA.1: Formulate questions that can be addressed with data. Use observations, surveys, and experiments to collect, represent, and interpret the data using tables (including frequency tables), line plots, and bar graphs.	MA.4.DA.1.a.1: Interpret data from a table or bar graph.
MA.4.DA.2: Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using data displayed in line plots.	MA.4.DA.2.a.1: Graph provided data on a line graph.
MA.4.DA.3: Interpret data displayed in a circle graph.	MA.4.DA.3.a.1: Use the circle graph to estimate about how many people/items are in a section. [Limit section divisions to halves, thirds, and fourths.]