



**Content Connectors aligned to the
Indiana Academic Standards
Mathematics Grade 8**

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.

Indiana Academic Standards	Content Connectors
Number Sense	
MA.8.NS.1: Give examples of rational and irrational numbers and explain the difference between them. Understand that every number has a decimal expansion; for rational numbers, show that the decimal expansion terminates or repeats, and convert a decimal expansion that repeats into a rational number.	MA.8.NS.1.a.1: Identify π as an irrational number.
	MA.8.NS.1.a.2: Round irrational numbers to the hundredths place.
MA.8.NS.2: Use rational approximations of irrational numbers to compare the size of irrational numbers, plot them approximately on a number line, and estimate the value of expressions involving irrational numbers.	MA.8.NS.2.a.1: Use approximations of irrational numbers to locate them on a number line.
MA.8.NS.3: Given a numeric expression with common rational number bases and integer exponents, apply the properties of exponents to generate equivalent expressions.	MA.8.NS.3.a.1: Use properties of integer exponents to produce equivalent expressions.
MA.8.NS.4: Use square root symbols to represent solutions to equations of the form $x^2 = p$, where p is a positive rational number.	MA.8.NS.4.a.1: Solve equations using square root properties.
Computation	
MA.8.C.1: Solve real-world problems with rational numbers by using multiple operations.	MA.8.C.1.a.1: Solve real-world problems with rational numbers by using two operations.
MA.8.C.2: Solve real-world and other mathematical problems involving numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Interpret scientific notation that has been generated by technology, such as a scientific calculator, graphing calculator, or excel spreadsheet.	MA.8.C.2.a.1: Perform operations with numbers expressed in scientific notation.
Algebra & Functions	
MA.8.AF.1: Solve linear equations with rational number coefficients fluently, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. Represent real-world problems using linear equations and inequalities in one variable and solve such problems.	MA.8.AF.1.a.1: Solve linear equations with 1 variable.
MA.8.AF.2: Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by transforming a given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results	MA.8.AF.2.a.1: Solve linear equations with 1 variable.



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(where a and b are different numbers).	
MA.8.AF.3: Understand that a function assigns to each x-value (independent variable) exactly one y-value (dependent variable), and that the graph of a function is the set of ordered pairs (x,y).	MA.8.AF.3.a.1: Distinguish between functions and non-functions, graphs, or tables.
MA.8.AF.4: Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear, has a maximum or minimum value). Sketch a graph that exhibits the qualitative features of a function that has been verbally described.	MA.8.AF.4.a.1: Given multiple graphs, describe the function as linear and not linear.
	MA.8.AF.4.a.2: Given a verbal description of a situation, create or identify a graph to model the situation.
	MA.8.AF.4.a.3: Describe or select the relationship between the two quantities given a line graph of a situation.
MA.8.AF.5: Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. Describe similarities and differences between linear and nonlinear functions from tables, graphs, verbal descriptions, and equations.	MA.8.AF.5.a.1: Given multiple graphs, describe the function as linear and not linear.
MA.8.AF.6: Construct a function to model a linear relationship between two quantities given a verbal description, table of values, or graph. Recognize in $y = mx + b$ that m is the slope (rate of change) and b is the y-intercept of the graph, and describe the meaning of each in the context of a problem.	MA.8.AF.6.a.1: Identify the rate of change (slope) and initial value (y-intercept) from graphs.
MA.8.AF.7: Compare properties of two linear functions given in different forms, such as a table of values, equation, verbal description, and graph (e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed).	MA.8.AF.7.a.1: Compare two linear functions given a table or a graph to answer a question about rates.
MA.8.AF.8: Understand that solutions to a system of two linear equations correspond to points of intersection of their graphs because points of intersection satisfy both equations simultaneously. Approximate the solution of a system of equations by graphing and interpreting the reasonableness of the approximation.	MA.8.AF.8.a.1: Identify the solution to a system of linear equations given a graph.
Geometry & Measurement	
MA.8.GM.1: Identify, define and describe attributes of three-dimensional geometric objects (right rectangular prisms, cylinders, cones, spheres, and pyramids). Explore the effects of slicing these objects using appropriate	MA.8.GM.1.a.1: Identify and describe attributes of three-dimensional geometric objects.



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technology and describe the two-dimensional figure that results.	
MA.8.GM.2: Solve real-world and other mathematical problems involving volume of cones, spheres, and pyramids and surface area of spheres.	MA.8.GM.2.a.1: Apply the formula to find the volume of 3-dimensional shapes (i.e., cubes, spheres, and cylinders).
MA.8.GM.3: Verify experimentally the properties of rotations, reflections, and translations, including: lines are mapped to lines, and line segments to line segments of the same length; angles are mapped to angles of the same measure; and parallel lines are mapped to parallel lines.	MA.8.GM.3.a.1: Recognize a rotation, reflection, or translation of a figure.
MA.8.GM.4: Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. Describe a sequence that exhibits the congruence between two given congruent figures.	MA.8.GM.4.a.1: Recognize congruent shapes resulting from transformations.
MA.8.GM.5: Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. Describe a sequence that exhibits the similarity between two given similar figures.	MA.8.GM.5.a.1: Identify a rotation, reflection, or translation of a plane figure.
MA.8.GM.6: Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	MA.8.GM.6.a.1: Identify a rotation, reflection, or translation of a plane figure.
MA.8.GM.7: Use inductive reasoning to explain the Pythagorean relationship.	MA.8.GM.7.a.1: Students will use a pattern to discover the relationship of the Pythagorean Theorem.
MA.8.GM.8: Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and other mathematical problems in two dimensions.	MA.8.GM.8.a.1: Apply the Pythagorean Theorem to determine lengths/distances in real-world situations.
	MA.8.GM.8.a.2: Find the hypotenuse of a two-dimensional right triangle (Pythagorean Theorem).
MA.8.GM.9: Apply the Pythagorean Theorem to find the distance between two points in a coordinate plane.	MA.8.GM.9.a.1: Apply the Pythagorean Theorem to determine lengths/distances.
Data Analysis & Statistics	
MA.8.DSP.1: Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantitative variables. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	MA.8.DSP.1.a.1: Graph bivariate data using scatter plots and identify possible associations between the variables.
	MA.8.DSP.1.a.2: Using scatter plots, identify data points that appear to be outliers.
MA.8.DSP.2: Know that straight lines are widely used to model	MA.8.DSP.2.a.1: Identify a linear association when analyzing



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relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and describe the model fit by judging the closeness of the data points to the line.	bivariate data on a scatter plot.
MA.8.DSP.3: Write and use equations that model linear relationships to make predictions, including interpolation and extrapolation, in real-world situations involving bivariate measurement data; interpret the slope and y-intercept.	MA.8.DSP.3.a.1: Using the line of best fit to find a point that answers a question about the data.
MA.8.DSP.4: Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. Understand and use appropriate terminology to describe independent, dependent, complementary, and mutually exclusive events.	MA.8.DSP.4.a.1: Determine the probability of simple events.
MA.8.DSP.5: Represent sample spaces and find probabilities of compound events (independent and dependent) using methods, such as organized lists, tables, and tree diagrams.	MA.8.DSP.5.a.1: Determine the theoretical probability of multistage probability experiments (2 coins, 2 dice).
	MA.8.DSP.5.a.2: Collect data from multistage probability experiments (2 coins, 2 dice).
MA.8.DSP.6: For events with a large number of outcomes, understand the use of the multiplication counting principle. Develop the multiplication counting principle and apply it to situations with a large number of outcomes.	