



## Content Connectors aligned to the Indiana Academic Standards Mathematics Grade 7

**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
<b>Number Sense</b>	
MA.7.NS.1: Find the prime factorization of whole numbers and write the results using exponents.	MA.7.NS.1.a.1: Identify a prime factorization.
MA.7.NS.2: Understand the inverse relationship between squaring and finding the square root of a perfect square integer. Find square roots of perfect square integers.	MA.7.NS.2.a.1: Identify the square of a whole number.
MA.7.NS.3: Know there are rational and irrational numbers. Identify, compare, and order rational and common irrational numbers ( $\sqrt{2}$ , $\sqrt{3}$ , $\sqrt{5}$ , $\pi$ ) and plot them on a number line.	MA.7.NS.3.a.1: Understand the definition of rational and irrational numbers.
	MA.7.NS.3.a.2: Order or compare rational and irrational numbers.
<b>Computation</b>	
MA.7.C.1: Understand $p + q$ as the number located a distance $ q $ from $p$ , in the positive or negative direction, depending on whether $q$ is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.	MA.7.C.1.a.1: Add a positive and negative integer.
MA.7.C.2: Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$ . Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.	MA.7.C.2.a.1: Identify the difference between two given numbers on a number line using the concept of absolute value.
MA.7.C.3: Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers.	MA.7.C.3.a.1: Solve multiplication problems with positive/negative integers.
MA.7.C.4: Understand that integers can be divided, provided that the divisor is not zero, and that every quotient of integers (with non-zero divisor) is a rational number. Understand that if $p$ and $q$ are integers, then $-(p/q) = (-p)/q = p/(-q)$ .	MA.7.C.4.a.1: Solve division problems with positive/negative integers.
MA.7.C.5: Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.	MA.7.C.5.a.1: Determine unit rates given a ratio of lengths, areas, and other quantities measured in like units.
	MA.7.C.5.a.2: Solve one step problems involving unit rates associated with ratios of fractions.
MA.7.C.6: Use proportional relationships to solve ratio and percent problems with multiple operations, such as the following: simple interest, tax, markups, markdowns, gratuities, commissions, fees, conversions within and across measurement systems, percent increase and decrease, and percent error.	MA.7.C.6.a.1: Use proportions to solve ratio problems.
	MA.7.C.6.a.2: Solve word problems involving ratios.
	MA.7.C.6.a.3: Use proportional relationships to solve multistep percent problems.



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MA.7.C.7: Compute with rational numbers fluently using a standard algorithmic approach.	
MA.7.C.8: Solve real-world problems with rational numbers by using one or two operations.	MA.7.C.8.a.1: Understand the order of operations to solve real-world multi-step problems using whole numbers.
Algebra & Functions	
MA.7.AF.1: Apply the properties of operations (e.g., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions, including situations that involve factoring (e.g., given $2x - 10$ , create an equivalent expression $2(x - 5)$ ). Justify each step in the process.	MA.7.AF.1.a.1: Add and subtract like terms.
	MA.7.AF.1.a.2: Use the distributive property to expand expressions.
MA.7.AF.2: Solve equations of the form $px + q = r$ and $p(x + q) = r$ fluently, where $p$ , $q$ , and $r$ are specific rational numbers. Represent real-world problems using equations of these forms and solve such problems.	MA.7.AF.2.a.1: Solve equations with 1 variable based on real-world problems.
	MA.7.AF.2.a.2: Use variables to represent quantities in a real-world or mathematical problem to solve problems by reasoning about the quantities.
MA.7.AF.3: Solve inequalities of the form $px + q (> \text{ or } \geq) r$ or $px + q (< \text{ or } \leq) r$ , where $p$ , $q$ , and $r$ are specific rational numbers. Represent real-world problems using inequalities of these forms and solve such problems. Graph the solution set of the inequality and interpret it in the context of the problem.	MA.7.AF.3.a.1: Solve inequalities with 1 variable based on real-world problems.
	MA.7.AF.3.a.2: Use a calculator to solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$ , where $p$ , $q$ , and $r$ are specific integers.
	MA.7.AF.3.a.3: Recognize the graph of an inequality.
MA.7.AF.4: Define slope as vertical change for each unit of horizontal change and recognize that a constant rate of change or constant slope describes a linear function. Identify and describe situations with constant or varying rates of change.	MA.7.AF.4.a.1: Relate slope to rate of change between two variables.
	MA.7.AF.4.a.2: Using real world examples, recognize the graph that shows the correct slope between two variables.
MA.7.AF.5: Graph a line given its slope and a point on the line. Find the slope of a line given its graph.	MA.7.AF.5.a.1: Understand how to calculate the slope of a line.
MA.7.AF.6: Decide whether two quantities are in a proportional relationship (e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin).	MA.7.AF.6.a.1: Identify if the relationship is proportional between two quantities in a table.
	MA.7.AF.6.a.2: Determine if two quantities are in a proportional relationship using points graphed on a coordinate plane.
MA.7.AF.7: Identify the unit rate or constant of proportionality in tables, graphs, equations, and verbal descriptions of proportional relationships.	MA.7.AF.7.a.1: Given a table or a graph of a line, recognize the unit rate.
MA.7.AF.8: Explain what the coordinates of a point on the graph of a proportional relationship mean in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ , where $r$ is the unit rate.	MA.7.AF.8.a.1: Calculate the rate of change.



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MA.7.AF.9: Identify real-world and other mathematical situations that involve proportional relationships. Write equations and draw graphs to represent proportional relationships and recognize that these situations are described by a linear function in the form $y = mx$ , where the unit rate, $m$ , is the slope of the line.	MA.7.AF.9.a.1: Represent proportional relationships on a line graph.
<b>Geometry &amp; Measurement</b>	
MA.7.GM.1: Draw triangles (freehand, with ruler and protractor, and using technology) with given conditions from three measures of angles or sides, and notice when the conditions determine a unique triangle, more than one triangle, or no triangle.	MA.7.GM.1.a.1: Students will be able to name if the triangle is obtuse, acute, or right.
MA.7.GM.2: Identify and describe similarity relationships of polygons including the angle-angle criterion for similar triangles, and solve problems involving similarity.	MA.7.GM.2.a.1: Student will identify similar polygons.
MA.7.GM.3: Solve real-world and other mathematical problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing. Create a scale drawing by using proportional reasoning.	MA.7.GM.3.a.1: When given a real world situation, students will be able to determine the appropriate scale (bigger or smaller).
MA.7.GM.4: Solve real-world and other mathematical problems that involve vertical, adjacent, complementary, and supplementary angles.	MA.7.GM.4.a.1: Identify adjacent and vertical in a real world situation.
MA.7.GM.5: Understand the formulas for area and circumference of a circle and use them to solve real-world and other mathematical problems; give an informal derivation of the relationship between circumference and area of a circle.	MA.7.GM.5.a.1: Understand the difference between area and circumference.
MA.7.GM.6: Solve real-world and other mathematical problems involving volume of cylinders and three-dimensional objects composed of right rectangular prisms.	MA.7.GM.6.a.1: Given a model and an equation with all variables given students will find volume of a cylinder.
MA.7.GM.7: Construct nets for right rectangular prisms and cylinders and use the nets to compute the surface area; apply this technique to solve real-world and other mathematical problems.	MA.7.GM.7.a.1: Understand what surface area is and identify in a real world situation.
<b>Data Analysis &amp; Statistics</b>	
MA.7.DSP.1: Understand that statistics can be used to gain information about a population by examining a sample of the population and generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	MA.7.DSP.1.a.1: Determine sample size to answer a given question.



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MA.7.DSP.2: Use data from a random sample to draw inferences about a population. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.	MA.7.DSP.2.a.1: Interpret the data to draw conclusions.
MA.7.DSP.3: Find, use, and interpret measures of center (mean and median) and measures of spread (range, interquartile range, and mean absolute deviation) for numerical data from random samples to draw comparative inferences about two populations.	MA.7.DSP.3.a.1: Identify the range (high/low), median (middle), mean, or mode of a given data set.
	MA.7.DSP.3.a.2: Compare two similar populations/models to draw a conclusion.
	MA.7.DSP.3.a.3: Make or select an appropriate statements based upon two unequal data sets using measure of central tendency and shape.
MA.7.DSP.4: Make observations about the degree of visual overlap of two numerical data distributions represented in line plots or box plots. Describe how data, particularly outliers, added to a data set may affect the mean and/or median.	MA.7.DSP.4.a.1: Make or select a statement to compare the distribution of two data sets.
MA.7.DSP.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Understand that a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. Understand that a probability of 1 indicates an event certain to occur and a probability of 0 indicates an event impossible to occur.	MA.7.DSP.5.a.1: Describe the probability of events as being certain or impossible.
MA.7.DSP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its relative frequency from a large sample.	MA.7.DSP.6.a.1: Make a prediction regarding the probability of an event occurring; conduct simple probability experiments.
MA.7.DSP.7: Develop probability models that include the sample space and probabilities of outcomes to represent simple events with equally likely outcomes. Predict the approximate relative frequency of the event based on the model. Compare probabilities from the model to observed frequencies; evaluate the level of agreement and explain possible sources of discrepancy.	MA.7.DSP.7.a.1: Compare actual results of simple experiments with theoretical probabilities.