INDIANA DEPARTMENT of EDUCATION

2024 INDIANA CONTENT CONNECTORS

MATHEMATICS

GRADE 6

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Indiana Content Connectors Context and Purpose

Introduction

The Indiana Content Connectors for Grade 6 Mathematics are the result of a process designed to identify, evaluate, synthesize, and create high-quality learning expectations for Indiana students with significant cognitive disabilities.

The Indiana Department of Education (IDOE) convened stakeholder committees to review proposed revisions to Indiana's Alternative Standards, known as content connectors. The content connectors are designed to measure the knowledge and skills of students with the most significant cognitive disabilities and are assessed with the state's alternate assessment. The content connectors are designed to ensure that all Indiana students in this population are prepared with essential knowledge and skills needed to access employment, enrollment, or enlistment leading to service.

What are the Content Connectors and how should they be used?

The Indiana Content Connectors are designed to help educators, parents, students, and community members understand the necessary content for each grade level, and within each content area domain, to access employment, enrollment, or enlistment leading to service. These content connectors should form the basis for strong core instruction for all students at each grade level and content area. The content connectors identify the minimum academic content or skills to which Indiana students need access in order to be prepared for success after graduation, but they are not an exhaustive list.

While the Indiana Content Connectors establish key expectations for knowledge and skills and should be used as the basis for curriculum, the content connectors by themselves do not constitute a curriculum. It is the responsibility of the local school corporation to select and formally adopt curricular tools, including textbooks and any other supplementary materials, that align with Indiana Content Connectors. Additionally, corporation and school leaders should consider the appropriate instructional sequence of the content connectors as well as the length of time needed to teach each one. Every content connector has a unique place in the continuum of learning, but each content connector will not require the same amount of time and attention. A deep understanding of the vertical articulation of the standards will enable educators to make the best instructional decisions. These content connectors must also be complemented by robust, evidence-based instructional practices to support overall student development. By utilizing strategic and intentional instructional practices, other areas such as STEM and employability skills can be integrated with the content connectors.

Acknowledgments

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Grade 6 Mathematics

Standards and content connectors identified as essential for mastery by the end of the grade level are indicated with gray shading and an "E."

Indiana Academic Standards	Content Connectors
Number Sense	
6.NS.1: Use positive and negative numbers to represent and compare quantities in real-world contexts, explaining the meaning of 0 in each situation. (E)	**6.NS.1a:** In a real-world context, identify if a situation represents a positive value, a negative value, or zero. (E)
6.NS.2: Explain how opposite signs of numbers indicate locations on opposite sides of 0 on the number line; identify the opposite of the opposite of a number.	**6.NS.2a:** Locate whole numbers and their opposites on a number line. (E)
6.NS.3: Compare and order rational numbers and plot them on a number line. Write, interpret, and explain statements of order for rational numbers in real-world contexts.	**6.NS.3a:** Use a number line to plot integers and positive fractions. Order up to three integers and positive fractions using a model or number line.
6.NS.4: Solve real-world problems with positive fractions and decimals by using one or two operations. (E)	**6.NS.4a:** Solve one-step real-world problems using decimals to the hundredths place or fractions. For addition and subtraction, limit denominators to 2, 3, 4, 5, 6, 8, 10, and 12. (E)
6.NS.5: Apply the order of operations and properties of operations (i.e., identity, inverse, commutative properties of addition and multiplication, associative properties of addition and multiplication, and distributive property) to evaluate numerical expressions with nonnegative rational numbers, including those using grouping symbols, such as parentheses, and involving whole number exponents. (E)	**6.NS.5a:** Apply the order of operations and properties (commutative, associative, and distributive property) to evaluate numerical expressions with whole numbers. (E)

6.NS.6: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers from 1 to 100, with a common factor as a multiple of a sum of two whole numbers with no common factor.	**6.NS.6a:** Find the greatest common factor of two whole numbers less than or equal to 60 and the least common multiple of two whole numbers less than or equal to ten. Use the distributive property to express a sum of two whole numbers from 1 to 60, with a common factor as a multiple of a sum of two whole numbers with no common factor.
6.NS.7: Apply the properties of operations (i.e., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions and to justify whether two linear expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them. (E)	**6.NS.7a:** Identify equivalent linear expressions by using the properties of operations.
6.NS.8: Evaluate positive rational numbers with whole number exponents.	**6.NS.8a:** Understand that exponents represent repeated multiplication. Evaluate whole numbers (0-10) using exponents (limit to an exponent of 5). (E)
Ratios and Proportional Reasoning	
6.RP.1: Convert between any two representations (fractions, decimals, percents) of positive rational numbers without the use of a calculator. (E)	**6.RP.1a:** Given two numbers in different forms (decimals, fractions, or percents) identify that numbers are equivalent. Include the use of visual models. (E)
6.RP.2: Understand the concept of a unit rate and use terms related to rate in the context of a ratio relationship.	**6.RP.2a:** Understand the concept of a unit rate in the context of a ratio relationship. (E)
6.RP.3: Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane.	**6.RP.3a:** Find missing values in a table that represents a proportional relationship. Plot provided values on a coordinate plane. (E)
6.RP.4: Solve real-world and other mathematical problems involving rates and ratios using models and strategies such as reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. (E)	**6.RP.4a:** Solve real-world and other mathematical one-step problems with whole number unit rates and ratios using models and various strategies (e.g., table of equivalent ratios, double number lines, tape diagrams, or equations).

6.RP.5: Use variables to represent two quantities in a proportional relationship in a real-world problem; write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (E)	**6.RP.5a:** Given a real-world problem and a graph or table representing a proportional relationship, identify the independent and dependent variables and explain the relationship between them.
Algebra and Functions	
6.AF.1: Define and use multiple variables when writing expressions to represent real-world and other mathematical problems, and evaluate them for given values. (E)	**6.AF.1a:** Write one-operation single-variable expressions to represent real-world problems and evaluate them for given values (e.g., Miguel has a stack of cards. He added three cards to the stack. An expression that represents how many total cards Miguel has is $x + 3$). (E)
6.AF.2: Demonstrate which values from a specified set, if any, make the equation or inequality true. Use substitution to determine whether a given number in a specified set makes an equation or inequality true. (E)	**6.AF.2a:** Given a set of whole numbers, use substitution to determine which number makes an equation or inequality true.
6.AF.3: Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p, q and x are all nonnegative rational numbers. Represent real-world problems using equations of these forms and solve such problems. (E)	**6.AF.3a:** Solve real-world one-step linear equations using whole numbers.
6.AF.4: Write an inequality of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$, where c is a rational number, to represent a constraint or condition in a real-world or other mathematical problem. Explain that inequalities have infinitely many solutions and how to represent solutions on a number line diagram.	**6.AF.4a:** Represent a real-world problem as a one-step inequality in the form of $x > c$, $x \geq c$, $x < c$, or $x \leq c$, where c is a whole number. (E)

6.AF.5: Solve real-world and other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. (E)	**6.AF.5a:** Plot and find the distance between points that either have the same first coordinate or the same second coordinate on the coordinate plane.
Geometry and Measurement	
6.GM.1: Convert between measurement systems (Customary to metric and metric to Customary) given the conversion factors, and use these conversions in solving real-world problems.	**6.GM.1a:** Convert between measurement systems (Customary to Customary and metric to metric) given the conversion factors. (E)
6.GM.2: Apply the sums of interior angles of triangles and quadrilaterals to solve real-world and mathematical problems.	**6.GM.2a:** Find the unknown angle in triangles and quadrilaterals when provided the sum of interior angles.
6.GM.3: Find the area of complex shapes composed of polygons by composing or decomposing into simple shapes; apply this technique to solve real-world and other mathematical problems.	**6.GM.3a:** In real-world and mathematical problems, find the area of complex shapes consisting of rectangles and triangles by composing or decomposing into simple shapes when provided the formulas. (E)
6.GM.4: Find the volume of a right rectangular prism with fractional edge lengths using unit cubes of the appropriate unit fraction edge lengths (e.g., using technology or concrete materials) and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths to solve real-world and other mathematical problems. (E)	**6.GM.4a:** Find the volume of a right rectangular prism with fractional number side lengths limited to halves when given the formula $V = lwh$, a model, and all required measurements.
Data Analysis and Statistics	
6.DS.1: Select, create, and interpret graphical representations of numerical data, including line plots, histograms, and box plots.	**6.DS.1a:** Create histograms given a data set. Use box plots to interpret data.
6.DS.2: Formulate statistical questions; collect and organize the data (e.g., using technology), and display and interpret the data with graphical representations (e.g., using technology). (E)	**6.DS.2a:** Formulate a statistical question. Organize data to create line plots. (E)

6.DS.3: Summarize numerical data sets in relation to their context in multiple ways, such as: a. Report the number of observations; b. Describe the nature of the attribute under investigation, including how it was measured and its units of measurement; c. Determine quantitative measures of center (mean and/or median) and spread (range and interquartile range); d. Describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered; and e. Relate the choice of measures of center and spread to the shape of the data distribution and the context in which the data were gathered. (E)	**6.DS.3a:** Given a data set: report the number of observations; identify the unit of measurement; calculate mean and/or median, range, and IQR (Interquartile Range); describe the pattern. (E)