INDIANA DEPARTMENT of EDUCATION

2024 INDIANA CONTENT CONNECTORS

MATHEMATICS

GRADE 5

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Indiana Content Connectors Context and Purpose

Introduction

The Indiana Content Connectors for Grade 5 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

IDOE appreciates the time, dedication, and expertise offered by Indiana's K-12 general and special educators, higher education professors, representatives from business and industry, families, and other stakeholders who contributed to the development of the Indiana Content Connectors. We wish to specially acknowledge the committee members, as well as participants in the public comment period, who dedicated many hours to the review and evaluation of these content connectors designed to prepare Indiana students for success after graduation.

Grade 5 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	
5.NS.1: Use a number line to compare and order fractions, mixed numbers, and decimals to thousandths. Write the results using > , = , and < symbols. (E)	**5.NS.1a:** Use a number line to compare two fractions with same or different denominators, two mixed numbers, or two decimals to the hundredths place. Record the comparisons using symbols >, <, or =. Limit denominators to 2, 3, 4, 5, 6, 8, 10 and 12. (E)
5.NS.2: Explain different interpretations of fractions, including as parts of a whole, parts of a set, and division of whole numbers by whole numbers.	**5.NS.2a:** Represent fractions as parts of a whole, parts of a set, and division of whole numbers by whole numbers. (E)
5.NS.3: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	**5.NS.3a:** Use whole number exponents from one to three to denote powers of 10 from 10 to 1,000 and explain the relationship of the zeros in the base and product.
5.NS.4: Model percents as parts of 100 using pictures or diagrams and identify the equivalent fraction.	**5.NS.4a:** Model percents as part of 100 using pictures or diagrams. (E)
Computation and Algebraic Thinking	
5.CA.1: Find whole-number quotients and remainders with up to four-digit dividends and two-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 used. (E)	**5.CA.1a:** Find whole number quotients with and without remainders up to 200 with three-digit dividends and two-digit divisors using any strategy. Describe the strategy used such as place value strategies, properties of operations, and the relationship between multiplication and division.

5.CA.2: Solve real-world problems involving multiplication and division of whole numbers (e.g., by using equations to represent the problem). In division problems that involve a remainder, explain how the remainder affects the solution to the problem. (E)	**5.CA.2a:** Solve real-world problems involving multiplication and division of whole numbers with or without remainders within 200. (E)
5.CA.3: Add and subtract fractions and mixed numbers with unlike denominators using strategies or the standard algorithm.	**5.CA.3a:** Add and subtract fractions with unlike denominators limiting denominators to 2, 4, 5, and 10.
5.CA.4: Solve real-world problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators (e.g., by using visual fraction models and equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess whether the answer is reasonable. (E)	**5.CA.4a:** Solve real-world problems involving addition and subtraction of fractions with unlike denominators. Limit denominators to 2, 4, 5, and 10. (E)
5.CA.5: Use visual fraction models to multiply a fraction by a fraction or a whole number. (E)	**5.CA.5a:** Use visual fraction models to multiply a fraction by a fraction or a whole number up to four.
5.CA.6: Use visual fraction models and numbers to divide a fraction by a fraction or a whole number. (E)	**5.CA.6a:** Use visual fraction models to divide a fraction by a fraction or a whole number up to four.
5.CA.7: Solve real-world problems involving multiplication of fractions, including mixed numbers (e.g., by using visual fraction models and equations to represent the problem). (E)	**5.CA.7a:** Solve real-world problems involving multiplication of a fraction by a fraction or a whole number up to four using visual fraction models. (E)
5.CA.8: Solve real-world problems involving division of fractions and mixed numbers (e.g., by using visual fraction models and equations to represent the problem). (E)	**5.CA.8a:** Solve real-world problems involving the division of a fraction by a fraction or a whole number up to four using visual fraction models. (E)
5.CA.9: Add, subtract, multiply, and divide decimals to hundredths, using models or drawings and strategies based on place value or the properties of operations. Describe the strategy and explain the reasoning.	**5.CA.9a:** Add and subtract decimals to hundredths. Multiply, and divide decimals to hundredths using models or drawings and strategies based on place value or the properties of operations.

5.CA.10: Solve real-world problems involving addition, subtraction, multiplication, and division with decimals to hundredths including problems that involve money in decimal notation (e.g., by using equations, models or drawings, and strategies based on place value or properties of operations to represent the problem). (E)	**5.CA.10a:** Solve one-step real-world money problems involving addition, subtraction, multiplication, and division with decimals to hundredths place. (E)
5.CA.11: Represent real-world problems and equations by graphing ordered pairs in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	**5.CA.11a:** Represent real-world problems by graphing ordered pairs in the first quadrant of the coordinate plane. (E)
Geometry	
5.G.1: Identify, describe, and draw triangles (right, acute, obtuse) and circles using appropriate tools (e.g., ruler or straightedge, compass, and technology). Define and model the relationship between radius and diameter.	**5.G.1a:** Model right, acute, and obtuse triangles using appropriate tools (e.g., ruler or straightedge, compass, or technology) and identify the radius and diameter in circles.
Measurement	
5.M.1: Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real-world problems.	**5.M.1a:** Given the conversions, convert among measurements of time (e.g., days in a week, hours in a day, minutes in an hour) and length (e.g., inches in a foot, feet in a yard, centimeters in a meter) in real-world problems. (E)
5.M.2: Find the area of a rectangle with fractional side lengths by modeling with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	**5.M.2a:** Find the area of rectangles and triangles with fractional side lengths limited to halves by modeling with unit squares or multiplying the side lengths.
5.M.3: Develop and use formulas for the area of triangles, parallelograms, and trapezoids. Solve real-world and other mathematical problems that involve perimeter and area of triangles, parallelograms, and trapezoids, using appropriate units for measures. (E)	**5.M.3a:** Solve real-world and other mathematical problems involving the perimeter of triangles, parallelograms, and trapezoids and area of triangles and parallelograms when given the formula.

5.M.4: Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths or multiplying the height by the area of the base. (E)	**5.M.4a:** Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes. (E)
5.M.5: Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for right rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths to solve real-world problems and other mathematical problems. (E)	**5.M.5a**: Find the volume of a right rectangular prism with whole number side lengths when given the formula V = l × w × h, a model, and all required measurements.
Data Analysis	
5.DA.1: Formulate questions that can be addressed with categorical and numerical data and make predictions about the data. Collect, organize, and graph data from observations, surveys, and experiments using line plots with fractional intervals, histograms, or other graphical representations that appropriately represent the data set. (E)	**5.DA.1a:** Generate questions that can be answered with a given graph (e.g., line plots, bar graphs, and line graphs). Collect, organize, and graph data from observations, surveys, and experiments that appropriately represent the data set. (E)
5.DA.2: Calculate measures of central tendency (mean, median, and mode) to describe a data set. Analyze data sets to determine which measure of central tendency appropriately describes the distribution of data. (E)	**5.DA.2a:** Calculate the mean, median, and mode to describe an ordered data set (mode does not require calculation, only observation and counting).