| **Required Course Numbers** | | | | | | | | | | | | | | | |
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| **Test Content Categories** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Mathematics |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A. Numbers and Operations—Whole Numbers |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Understands the processes, skills, and concepts related to the place-value system |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Compares and orders whole numbers |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Composes and decomposes multidigit numbers by using place value |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| c. Given a digit, identifies the place the digit is in and its value in that place |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| d. Recognizes that a digit in one place represents ten times what it represents in the place to its right and one-tenth what it represents in the place to its left, and extends this reasoning to any number of places |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| e. Rounds multidigit numbers to any place value |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| f. Converts between numeral form, expanded form, and word form for numbers |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Knows how to apply appropriate mental strategies for performing operations |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Recognizes patterns, math facts, composition and decomposition of numbers, and compensation as mental strategies |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Selects and utilizes appropriate strategies |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Understands processes, skills, and concepts related to operations involving whole numbers |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Uses concrete models, drawings, and number lines to illustrate, interpret, and explain addition, subtraction, multiplication, and division of whole numbers, including multidigit numbers |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Illustrates and explains multiplication and division problems using equations, rectangular arrays, area models, and partitioning |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| c. Uses various strategies and algorithms to perform operations on whole numbers, including multidigit numbers, and interprets the remainder in division problems in context |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| d. Uses the four operations (addition, subtraction, multiplication, and division) to solve multistep mathematical and real-life problems involving whole numbers and determines whether answers are reasonable |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| e. Identifies different problem situations (e.g., adding to, taking away from, comparing) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| f. Uses the relationship between operations to solve problems (e.g., inverse operations, repeated addition, repeated subtraction) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **B. Numbers and Operations—Fractions** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Understands the multiple representations and meanings of a fraction |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Converts between fractions and decimals |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Recognizes that a fraction can be interpreted as division of the numerator by the denominator or the remainder in a whole number division problem |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Understands the processes, skills, and concepts for working with rational fractions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Represents fractions using visual fraction models, sets of objects, grids, area models, and number lines |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Composes and decomposes fractions and understands the use of unit fractions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| c. Recognizes that the value of a unit fraction decreases as the value of the denominator increases |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| d. Writes equivalent fractions or uses equivalent fractions (including whole numbers) and benchmark fractions to compare fractions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| e. Explains why the same whole must be used when comparing fractions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **C. Algebraic Thinking** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Knows the processes, skills, and concepts related to patterns |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Identifies, extends, describes, or generates number, shape, and other repeating patterns |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Makes conjectures, predictions, or generalizations based on patterns |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Knows the properties of the four operations and the processes, skills, and concepts for solving abstract or real-world problems |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Applies properties of operations (i.e., commutative, associative, distributive) and uses them as strategies to add, subtract, multiply, and divide |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Uses the order of operations to solve multistep problems |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| c. Represents and solves word problems involving the four operations using equations with a variable representing the unknown in any position |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **D. Geometry, Measurement, and Data** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Understands the processes, skills, and concepts for reasoning about shapes and their attributes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Classifies and compares shapes according to their attributes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Identifies two- and three-dimensional shapes by name |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Understands the processes, skills, and concepts for solving problems involving measurement and estimation using standard and nonstandard units of measure |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Solves problems involving elapsed time, money, length, volume, and mass |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Solves mathematical and real-life problems involving perimeter and area of polygons, including shapes that are partitioned into parts with equal areas, where the area of each part is a fraction of the entire area of the shape |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| c. Relates the concept of area to the operations of multiplication and addition |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| d. Uses relative sizes of United States customary units and metric units and converts units within each system |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Understands the processes, skills, and concepts for representing and interpreting data |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Collects, organizes, and represents data |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Interprets data presented in various graphical formats |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **I. Science** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **A. Nature of Science and Engineering** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Engaging with the natural world |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Basic science skills (e.g., observing; describing; using appropriate tools; collecting and analyzing data; drawing conclusions; communicating findings) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Crosscutting concepts (e.g., cycles; patterns; cause and effect; systems) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Solving problems related to the everyday world |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| a. Defining a simple problem |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| b. Developing a possible solution by using sketches, drawings, and physical models |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| c. Comparing different solutions to determine which solution best solves the problem |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **B. Physical Science** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Basic properties of matter (color, texture, hardness) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Basic properties of waves (sound and light) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Energy and changes resulting from heating, cooling, mixing; placing in sunlight |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4. Forces and motion and interaction of objects (effect of pushes and pulls on the motion of an object) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **C. Earth and Space Science** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Motion of the Earth, Sun, Moon and stars and the effect on seasonal and daily weather and daylight patterns |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Basic physical and chemical properties of Earth materials (sand, soil, rocks, water) and the changing Earth system (fast or slow change; fossil evidence; human impact; land, water and air) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **D. Life Science** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1. Basic characteristics of organisms and their environments (e.g., survival needs and behaviors; structures that support growth; habitats) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Life cycles of organisms and inherited traits |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Interdependent relationships in ecosystems |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |