

CURRICULUM MAP
MATH
GRADE 7

August/September	October	November	December	January
<p>Data Analysis & Probability 1. Read, create and interpret box-and-whisker plots, stem-and-leaf plots, and other types of graphs, when appropriate.</p> <p>3. Analyze a set of data by using and comparing combinations of measures of center (mean, mode, median) and measures of spread (range, quartile, interquartile range), and describe how the inclusion or exclusion of outliers affects those measures.</p> <p>7. Compute probabilities of compound events; e.g., multiple coin tosses or multiple rolls of number cubes, using such methods as organized lists, tree diagrams and area models.</p> <p>Data Analysis & Probability 8. Make predictions based on theoretical probabilities, design and conduct an experiment to test the predictions, compare actual results to predicted results, and explain differences.</p>	<p>Patterns, Functions, & Algebra 1. Represent and analyze patterns, rules and functions with words, tables, graphs and simple variable expressions.</p> <p>3. Recognize and explain when numerical patterns are linear or nonlinear progressions; e.g., 1, 3, 5, 7... is linear and 1, 3, 4, 8, 16... is nonlinear.</p> <p>5. Represent linear equations by plotting points in the coordinate plane.</p> <p>6. Represent inequalities on a number line or a coordinate plane.</p> <p>7. Justify that two forms of an algebraic expression are equivalent, and recognize when an expression is simplified; e.g., $4m = m + m + m + m$ or $a \cdot 5 + 4 = 5a + 4$.</p> <p>8. Use formulas in problem-solving situations.</p> <p>10. Analyze linear and simple nonlinear relationships to explain how a change in one variable results in the change of another.</p>	<p>Geometry & Spatial Sense 1. Use proportional reasoning to describe and express relationships between parts and attributes of similar and congruent figures.</p> <p>3. Use and demonstrate understanding of the properties of triangles. For example: a. Use Pythagorean Theorem to solve problems involving right triangles. b. Use triangle angle sum relationships to solve problems.</p> <p>4. Determine necessary conditions for congruence of triangles.</p> <p>5. Apply properties of congruent or similar triangles to solve problems involving missing lengths and angle measures.</p> <p>6. Determine and use scale factors for similar figures to solve problems using proportional reasoning.</p> <p>7. Identify the line and rotation symmetries of two-dimensional figures to solve problems.</p> <p>8. Perform translations, reflections, rotations and dilations of two-dimensional figures using a variety of methods (paper folding, tracing, graph paper)</p> <p>Measurement 4. Solve problems involving proportional relationships and scale factors; e.g., scale models that require unit conversions within the same measurement system.</p>	<p>Number, Number Sense & Operations 4. Use order of operations and properties to simplify numerical expressions involving integers, fractions and decimals.</p> <p>7. Solve problems using the appropriate form of a rational number (fraction, decimal or percent).</p>	<p>Measurement 6. Use strategies to develop formulas for finding area of trapezoids and volume of cylinders and prisms.</p> <p>7. Develop strategies to find the area of composite shapes using the areas of triangles, parallelograms, circles and sectors.</p> <p>8. Understand the difference between surface area and volume and demonstrate that two objects may have the same surface area, but different volumes or may have the same volume, but different surface areas.</p> <p style="text-align: right;">5/9/08</p>

CURRICULUM MAP
MATH
GRADE 7

February	March	April	May
<p>Measurement 2. <i>Convert units of area and volume within the same measurement system using proportional reasoning and a reference table when appropriate; e.g., square feet to square yards, cubic meters to cubic centimeters.</i></p>	<p>Number, Number Sense & Operations 1. Demonstrate an understanding of place value using powers of 10 and write large numbers in scientific notation. 2. Explain the meaning of exponents that are negative or 0. 3. Describe differences between rational and irrational numbers; e.g., use technology to show that some numbers (rational) can be expressed as terminating or repeating decimals and others (irrational) as non-terminating and non-repeating decimals. 5. <i>Explain the meaning and effect of adding, subtracting, multiplying and dividing integers; e.g., how adding two integers can result in a lesser value.</i> 6. Simplify numerical expressions involving integers and use integers to solve real-life problems. 8. Develop and analyze algorithms for computing with percents and integers, and demonstrate fluency in their use.</p> <p>Measurement 1. Select appropriate units for measuring derived measurements; e.g., miles per hour, revolutions per minute. 3. Estimate a measurement to a greater degree of precision than the tool provides. 5. Analyze problem situations involving measurement concepts, select appropriate strategies, and use an organized approach to solve narrative and increasingly complex problems. 9. Describe what happens to the surface area and volume of a three-dimensional object when the measurements of the object are changed; e.g., length of sides are doubled.</p>	<p>Geometry & Spatial Sense 2. Determine sufficient (not necessarily minimal) properties that define a specific two-dimensional figure or three-dimensional object. For example: a. Determine when one set of figures is a subset of another; e.g., all squares are rectangles. b. Develop a set of properties that eliminates all but the desired figure; e.g., only squares are quadrilaterals with all sides congruent and all angles congruent. 9. Draw representations of three-dimensional geometric objects from different views.</p> <p>Patterns, Function, & Algebra 2. Generalize patterns by describing in words how to find the next term. 4. Create visual representations of equation-solving processes that model the use of inverse operations.</p>	<p>Patterns, Function, & Algebra 9. Recognize a variety of uses for variables; e.g., placeholder for an unknown quantity in an equation, generalization for a pattern, formula. 11. Use graphing calculators or computers to analyze change; e.g., distance-time relationships.</p> <p>Data Analysis & Probability 2. <i>Analyze how decisions about graphing affect the graphical representation; e.g., scale, size of classes in a histogram, number of categories in a circle graph.</i> 4. Construct opposing arguments based on analysis of the same data, using different graphical representations. 5. Compare data from two or more samples to determine how sample selection can influence results. 6. Identify misuses of statistical data in articles, advertisements, and other media.</p> <p style="text-align: right;">5/9/08</p>

CURRICULUM MAP
MATH
GRADE 7

Benchmarks

Mathematical Processes Standard

Students use mathematical processes and knowledge to solve problems. Students apply problem-solving and decision-making techniques, and communicate mathematical ideas. The benchmarks for mathematical processes articulate what students should demonstrate in problem solving, representation, communication, reasoning and connections at key points in their mathematics program. Specific grade-level indicators have not been included for the mathematical processes standard because content and processes should be interconnected at the indicator level. Therefore, mathematical processes have been embedded within the grade-level indicators for the five content standards.

By the end of the 5-7 program:

- A. Clarify problem-solving situation and identify potential solution processes; e.g., consider different strategies and approaches to a problem, restate problem from various perspectives.
- B. Apply and adapt problem-solving strategies to solve a variety of problems, including unfamiliar and non-routine problem situations.
- C. Use more than one strategy to solve a problem, and recognize there are advantages associated with various methods.
- D. Recognize whether an estimate or an exact solution is appropriate for a given problem situation.
- F. Use deductive thinking to construct informal arguments to support reasoning and to justify solutions to problems.
- G. Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures.
- G. Relate mathematical ideas to one another and to other content areas; e.g., use area models for adding fractions, interpret graphs in reading, science and social studies.
- H. Use representations to organize and communicate mathematical thinking and problem solutions.
- I. Select, apply, and translate among mathematical representations to solve problems; e.g., representing a number as a fraction, decimal or percent as appropriate for a problem.
- J. Communicate mathematical thinking to others and analyze the mathematical thinking and strategies of others.
- K. Recognize and use mathematical language and symbols when reading, writing and conversing with others.