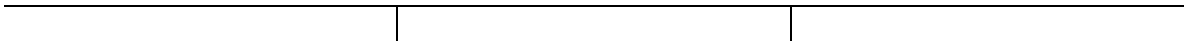
K-12 Mathematics Benchmarks

By the end of the 5-7 program:

Number, Number Sense and Operations	Measurement	Geometry and Spatial Sense
A. Represent and compare numbers less than 0 through familiar applications and extending the number line. B. Compare, order and convert among fractions, decimals and percents. C. Develop meaning for percents, including percents greater than 100 and less than 1. C. Use models and pictures to relate concepts of ratio, proportion and percent. E. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results. F. Apply number system properties when performing computations. G. Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations.	A. Select appropriate units to measure angles, circumference, surface area, mass and volume, using: • U.S. customary units; e.g., degrees, square feet, pounds, and other units as appropriate; • metric units; e.g., square meters, kilograms and other units as appropriate. B. Convert units of length, area, volume, mass and time within the same measurement system. C. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles and composite shapes, and surface area and volume of prisms and cylinders. D. Select a tool and measure accurately to a specified level of precision. E. Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature.	A. Identify and label angle parts and the regions defined within the plane where the angle resides. B. Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference. C. Specify locations and plot ordered pairs on a coordinate plane. D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties. D. Use proportions to express relationships among corresponding parts of similar figures. F. Describe and use the concepts of congruence, similarity and symmetry to solve problems.



K-12 Mathematics Benchmarks

By the end of the 5-7 program:

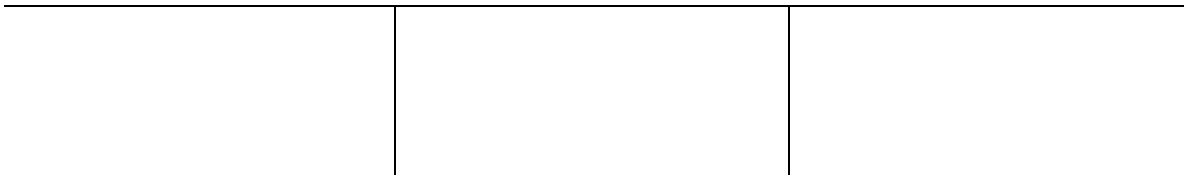
Patterns, Functions and Algebra	Data Analysis and Probability	Mathematical Processes
A. Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications. B. Represent, analyze and generalize a variety of patterns and functions with tables, graphs, words and symbolic rules. C. Use variables to create and solve equations and inequalities representing problem situations. D. Use symbolic algebra to represent and explain mathematical relationships. E. Use rules and variables to describe patterns, functions and other relationships. E. Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships. F. Write, simplify and evaluate algebraic expressions.	A. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate. B. Interpret data by looking for patterns and relationships, draw and justify conclusions, and answer related questions. C. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings. D. Compare increasingly complex displays of data, such as multiple sets of data on the same graph. E. Collect, organize, display and interpret data for a specific purpose or need. E. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data. G. Evaluate conjectures and predictions based upon data presented in	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. E. Use deductive thinking to construct informal arguments to support reasoning and to justify solutions to problems. F. Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures

	tables and graphs, and identify misuses of statistical data and displays.	

K-12 Mathematics Benchmarks

By the end of the 5-7 program:

Number, Number Sense and Operations	Measurement	Geometry and Spatial Sense
H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers. G. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.	F. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed. G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.	G. Describe and use properties of triangles to solve problems involving angle measures and side lengths of right triangles. H. Predict and describe results (size, position, orientation) of transformations of two-dimensional figures. I. Identify and draw three-dimensional objects from different views (top, side, front and perspective). H. Apply properties of equality and proportionality to solve problems involving congruent or similar figures; e.g., create a scale drawing.



K-12 Mathematics Benchmarks

By the end of the 5-7 program:

Patterns, Functions and Algebra	Data Analysis and Probability	Mathematical Processes
H. Solve linear equations and inequalities symbolically, graphically and numerically. I. Explain how inverse operations are used to solve linear equations. J. Use formulas in problem-solving situations. K. Graph linear equations and inequalities. L. Analyze functional relationships, and explain how a change in one quantity results in a change in the other. M. Approximate and interpret rates of change from graphical and numerical data.	H. Find all possible outcomes of simple experiments or problem situations, using methods such as lists, arrays and tree diagrams. I. Describe the probability of an event using ratios, including fractional notation. J. Compare experimental and theoretical results for a variety of simple experiments. I. Make and justify predictions based on experimental and theoretical probabilities.	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.