Pre-K-12 Standards and Key Benchmarks

Number and Operations Standard

Compute fluently and make reasonable estimates

Benchmarks:	Pre-K-2:	Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculators.
	3-5:	Develop fluency in adding, subtracting, multiplying, and dividing whole numbers.
	6-8:	Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.
	9-12:	Develop fluency in operations with real numbers, vectors, and matrices, using mental computation or paper-and-pencil calculations for simple cases and technology for more-complicated cases.

Algebra Standard

Understand patterns, relations and functions

Benchmark:	Pre-K-2:	Sort, classify, and order objects by size, number, and other properties.
	3-5:	Represent and analyze patterns and functions, using words, tables, and graphs.
	6-8:	Represent, analyze and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules.
	9-12:	Understand and perform transformations such as arithmetically combining, composing, and inverting commonly used functions, using technology to perform such operations on more complicated symbolic expressions.

Geometry Standard

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

Benchmarks:	Pre-K-2:	Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes.
	3-5:	Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.
	6-8:	Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.
	9-12:	Explore relationships (including congruence and similarity) among classes of two- and three- dimensional geometric objects, make and test conjectures about them, and solve problems involving them.

Measurement Standard

Apply appropriate techniques, tools, and formulas to determine measurements

Benchmarks:	Pre-K-2:	Use standard and nonstandard tools to measure.
	3-5:	Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.
	6-8:	Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more complex shapes.

	9-12:	Understand and use formulas for the area, surface area, and volume of geometric figures, including cones, spheres, and cylinders.

Data Analysis and Probability

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them

Benchmarks:	Pre-K-2:	Sort and classify objects according to their attributes and organize data about the objects.
	3-5:	Represent data using tables and graphs such as line plots, bar graphs, and line graphs.
	6-8:	Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.
	9-12:	Compute basic statistics and understand the distinction between a statistic and a parameter.

Source *National Council of Teachers of Mathematics 2002*