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Mathematics

Grades 3-5

Number Sense, Concepts, and Operations

Standard 1:

The student understands the different ways numbers are represented and used in the real world. (MA.A.1.2)

1. names whole numbers combining three-digit numeration (hundreds, tens, ones) and the use of number periods, such as ones, thousands, and millions and associates verbal names, written word names, and standard numerals with whole numbers, commonly used fractions, decimals, and percents.
2. understands the relative size of whole numbers, commonly used fractions, decimals, and percents.
3. understands concrete and symbolic representations of whole numbers, fractions, decimals, and percents in real-world situations.
4. understands that numbers can be represented in a variety of equivalent forms using whole numbers, decimals, fractions, and percents.

Standard 2:

The student understands number systems. (MA.A.2.2)

1. uses place-value concepts of grouping based upon powers of ten (thousandths, hundredths, tenths, ones, tens, hundreds, thousands) within the decimal number system.
2. recognizes and compares the decimal number system to the structure of other number systems such as the Roman numeral system or bases other than ten.

Standard 3:

The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving. (MA.A.3.2)

1. understands and explains the effects of addition, subtraction, and multiplication on whole numbers, decimals, and fractions, including

mixed numbers, and the effects of division on whole numbers, including the inverse relationship of multiplication and division.

2. selects the appropriate operation to solve specific problems involving addition, subtraction, and multiplication of whole numbers, decimals, and fractions, and division of whole numbers.
3. adds, subtracts, and multiplies whole numbers, decimals, and fractions, including mixed numbers, and divides whole numbers to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculator.

Standard 4:

The student uses estimation in problem solving and computation. (MA.A.4.2)

1. uses and justifies different estimation strategies in a real-world problem situation and determines the reasonableness of results of calculations in a given problem situation.

Standard 5:

The student understands and applies theories related to numbers. (MA.A.5.2)

1. understands and applies basic number theory concepts, including primes, composites, factors, and multiples.

Measurement

Standard 1:

The student measures quantities in the real world and uses the measures to solve problems. (MA.B.1.2)

1. uses concrete and graphic models to develop procedures for solving problems related to measurement including length, weight, time, temperature, perimeter, area, volume, and angle.
2. solves real-world problems involving length, weight, perimeter, area, capacity, volume, time, temperature, and angles.

Standard 2:

The student compares, contrasts, and converts within systems of measurement (both standard/nonstandard and metric/customary). (MA.B.2.2)

1. uses direct (measured) and indirect (not measured) measures to calculate and compare measurable characteristics.
2. selects and uses appropriate standard and nonstandard units of measurement, according to type and size.

Standard 3:

The student estimates measurements in real-world problem situations. (MA.B.3.2)

1. solves real-world problems involving estimates of measurements, including length, time, weight, temperature, money, perimeter, area, and volume.

Standard 4:

The student selects and uses appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations. (MA.B.4.2)

1. determines which units of measurement, such as seconds, square inches, dollars per tankful, to use with answers to real-world problems.
2. selects and uses appropriate instruments and technology, including scales, rulers, thermometers, measuring cups, protractors, and gauges, to measure in real-world situations.

Geometry and Spatial Sense

Standard 1:

The student describes, draws, identifies, and analyzes two- and three-dimensional shapes. (MA.C.1.2)

1. given a verbal description, draws and/or models two- and three-dimensional shapes and uses appropriate geometric vocabulary to write a description of a figure or a picture composed of geometric figures.

Standard 2:

The student visualizes and illustrates ways in which shapes can be combined, subdivided, and changed. (MA.C.2.2)

1. understands the concepts of spatial relationships, symmetry, reflections, congruency, and similarity
2. predicts, illustrates, and verifies which figures could result from a flip, slide, or turn of a given figure.

Standard 3:

The student uses coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically. (MA.C.3.2)

1. represents and applies a variety of strategies and geometric properties and formulas for two- and three-dimensional shapes to solve real-world and mathematical problems.

2. identifies and plots positive ordered pairs (whole numbers) in a rectangular coordinate system (graph).

Algebraic Thinking

Standard 1:

The student describes, analyzes, and generalizes a wide variety of patterns, relations, and functions. (MA.D.1.2)

1. describes a wide variety of patterns and relationships through models, such as manipulatives, tables, graphs, rules using algebraic symbols.
2. generalizes a pattern, relation, or function to explain how a change in one quantity results in a change in another.

Standard 2:

The student uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations. (MA.D.2.2)

1. represents a given simple problem situation using diagrams, models, and symbolic expressions translated from verbal phrases, or verbal phrases translated from symbolic expressions, etc.
2. uses informal methods, such as physical models and graphs, to solve real-world problems involving equations and inequalities.

Data Analysis and Probability

Standard 1:

The student understands and uses the tools of data analysis for managing information. (MA.E.1.2)

1. solves problems by generating, collecting, organizing, displaying, and analyzing data using histograms, bar graphs, circle graphs, line graphs, pictographs, and charts.
2. determines range, mean, median, and mode from sets of data.
3. analyzes real-world data to recognize patterns and relationships of the measures of central tendency using tables, charts, histograms, bar graphs, line graphs, pictographs, and circle graphs generated by appropriate technology, including calculators and computers.

Standard 2:

The student identifies patterns and makes predictions from an orderly display of data using concepts of probability and statistics. (MA.E.2.2)

1. uses models, such as tree diagrams, to display possible outcomes and to predict events.
2. predicts the likelihood of simple events occurring.

Standard 3:

The student uses statistical methods to make inferences and valid arguments about real-world situations. (MA.E.3.2)

1. designs experiments to answer class or personal questions, collects information, and interprets the results using statistics (range, mean, median, and mode) and pictographs, charts, bar graphs, circle graphs, and line graphs.
2. uses statistical data about life situations to make predictions and justifies reasoning.