

Parent Involvement and Awareness:

What Does My Child Study in Mathematics?

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In grades kindergarten through seventh, the Mathematics Standards are divided into five topics, or strands, in mathematics: Number Sense, Algebra and Functions, Measurement and Geometry, Statistics and Probability, and Mathematical Reasoning. Each strand consists of many mathematics concepts. Students engage in deeper and more sophisticated learning within each strand as they advance through the grades.

Number Sense

Much mathematics depends on numbers that are used to count, compute, measure, and estimate. When the Mathematics Standards refer to “number sense,” it means instruction in computation and number skills while also teaching students the concepts behind those skills. Examples of number skills are addition, subtraction, multiplication, division, fractions, decimals, percents, integers (including negative numbers), scientific notation, exponents, and estimation skills. At higher levels, this strand includes prime and composite numbers, the real number system including irrational numbers, and complex numbers. It is critical that all students learn number skills effectively and are able to apply those skills with understanding and flexibility.

Algebra and Functions

Algebra enables us to translate concrete experiences into graphs, equations, and general formulas. Algebra allows us to make abstract rules and generalizations about mathematical situations. Functions, one of the key areas of the study of algebra, are relationships that assign to each element in one set an element in a second set based upon a general rule that is always true. For example, to convert inches (one set) to feet (another set), the functional relationship tells us that for every twelve inches we have one foot. Functions are encountered informally in the elementary grades and grow in prominence and importance with the student’s increasing grasp of algebra in the higher grades.

Algebra is also studied as “generalized arithmetic,” a vital tool needed for solving equations. Students begin to solve problems “algebraically” by translating mathematical situations from natural language into the abstract language of algebra using symbols, variables, and operations. Learning algebra has become a requirement for high school graduation and entrance into college.

Geometry and Measurement

Geometry is the study of space and figures in space. Concepts in two- and three-dimensional geometry and measurement help students develop spatial reasoning. In the early grades, this includes the recognition and investigation of basic shapes such as triangles, circles, squares, spheres, and cubes as both pictures and real objects. In later grades, the study of geometry and measurement extends to concepts of area, perimeter, volume, and the measurement of angles. Students also learn the use of measuring tools such as rulers, protractors, and compasses in investigating geometric shapes. In high school, students study advanced geometrical relationships. Students must learn to understand and use geometric concepts, tools, and terminology in order to visualize and explain their world.

Statistics and Probability

Statistics is the mathematical analysis of data or information. Probability is used to calculate the likelihood of an event happening based upon theoretical or actual data. Together, they form the mathematics of prediction. This strand includes the definitions and calculations that “describe” a set of data. An example is an average, a number that may not tell how tall an individual person is, but describes with a number a generalization that is true about a group of people. In the elementary grades, students collect and display data in graphs, charts, and tables, in addition to calculating averages and performing simple probability experiments. This strand becomes more important in grade

seven and above, when the impact of statistics and probability on our daily lives can be discussed and understood using mathematics. Through statistics and probability, students develop the ability to collect and investigate real and experimental data, then interpret, draw conclusions, and make decisions based on that information.

Mathematical Reasoning

Through mathematical reasoning, or problem solving, students bring together a variety of their mathematics skills, knowledge, strategies, tools, and techniques to solve new and unique situations in mathematics and other subject areas. Mathematical reasoning helps students learn to reason correctly with the information given and, as a subject in mathematics, is very valuable in developing critical thinking. The strand of mathematical reasoning is different from the other four strands in that this strand is inherently embedded in each of the other strands and is fundamental in developing the skills and conceptual understanding for a solid mathematical foundation. It is important when looking at the Standards to see mathematical reasoning in all of the strands.



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