STAFFORD COUNTY PUBLIC SCHOOLS

Curriculum Overview
Eighth Grade Mathematics

Course Description:

   The Grade 8 Standards of Learning are taught in this course to prepare students for successful daily living and further study in algebra and geometry. The content extends concepts and skills learned in previous grades such as solving consumer-related problems, using numerical patterns in understanding relationships, and using probability and statistics to make predictions and inferences. Real numbers and their properties will be used to solve and justify the solutions in multi-step equations. The study of geometry will be expanded to include graphing and transformations in the coordinate plane, using the Pythagorean Theorem and the characteristics and measures of geometric figures to solve problems. Students will use approved scientific calculators wherever appropriate. Students enrolled in this class will take the Grade 8 Standards of Learning test. Following this course, students may enroll in Algebra I or Algebra I Part I as ninth graders.

Essential Skills/Processes:

The development of problem solving skills and logical reasoning is a major goal of the mathematics program at every level. Students will develop a wide range of mathematical skills and strategies for understanding and solving a variety of problem types, with an increased emphasis on consumer mathematics and practical problems.

   Mathematics has its own language, the vocabulary and symbols are very important to a student's understanding of concepts and use of mathematics to solve problems. Students will use mathematical skills, symbols, vocabulary to read mathematics, discuss mathematics, write about mathematics, do mathematics, and solve problems. Students build on the concrete reasoning experiences developed in elementary school while developing the deeper mathematical understandings required for success in more complex learning experiences.

   Technology is an important tool in both learning mathematics and solving problems in mathematics. To use technology appropriately and effectively students must know the basic facts, understand concepts, and be able to estimate and reason logically.

   Students are more likely to be successful if they are:
>   -self-motivated,
>   -able to recall and use prior math skills,
>   -willing to practice skills regularly, including homework, and
>   -persistent in problem solving.

Essential Knowledge:

Number, Number Sense, Computation and Estimation (14 items)
- Simplify numerical expressions involving positive exponents, using rational numbers, order of operations, and properties of operations with real number
- Compare and order decimals, fractions, percents, and numbers written in scientific notation
- Describe orally and in writing the relationships between the subsets of the real number system
- Solve practical problems involving rational numbers, percents, ratios, and proportions; and determine the percent increase or decrease for a given situation
- Apply the order of operations to evaluate algebraic expressions for given replacement values of the variables
- Determine whether a given number is a perfect square; and find the two consecutive whole numbers between which a square root lies.

Measurement and Geometry (14 items)
- Verify by measuring and describe the relationships among vertical angles, adjacent angles, supplementary angles, and complementary angles
- Measure angles of less than 360 degrees
- Investigate and solve practical problems involving volume and surface area of prisms, cylinders, cones, and pyramids
- Describe how changing one measured attribute of a figure affects the volume and surface area

- Apply transformations to plane figures and identify applications of transformations
- Construct a three-dimensional model, given the top or bottom, side, and front views
- Verify and apply the Pythagorean Theorem
- Solve practical area and perimeter problems involving composite plane figures

Probability, Statistics, Patterns, Functions, and Algebra (22 items)
- Determine the probability of independent and dependent events with and without replacement
- Make comparisons, predictions, and inferences, using information displayed in graphs and construct and analyze scatterplots
- Draw connections between any two representations (tables, graphs, words, and rules) of a given relationship
- Solve multistep linear equations in one variable with the variable on one and two sides of the equation
- Solve two-step linear inequalities and graph the results on a number line
- Identify properties of operations used to solve an equation
- Graph a linear equation in two variables
- Identify the domain, range, independent variable or dependent variable in a given situation

---

Resources:
- Stafford County Public Schools: http://stafford.schoolfusion.us/
- Middle School Program of Studies: http://stafford.schoolfusion.us/ . Click on For Parents/Students tab.
- VA Standards of Learning: http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/review.shtml
- School Report Card (VA Department of Education): http://www.doe.virginia.gov/statistics_reports/school_report_card/index.shtml
- Prentice Hall: Mathematics Course 3 ©2010 http://phschool.com/webcodes10/index.cfm?fuseaction=home.gotoWebCode&wcprefix=ask&wcsuffix=0099