



STAFFORD COUNTY PUBLIC SCHOOLS

Curriculum Overview Geometry Part I

Course Description:

Geometry Part I is designed for students who have successfully completed the standards for Algebra I. Geometry Part I is the first course of the two-course equivalent of Geometry. Students who complete both Geometry Part 1 and Geometry Part 2 successfully will receive one math credit and one elective credit. The two part Geometry course will explore the same concepts as Geometry; however, the instruction will be given over a longer period of time. This course is designed to meet the needs of the student who needs to understand basic geometry. Students develop an understanding of the reasoning process and the concept of proof. Properties and relationships of lines, angles, and triangles are developed inductively and then verified deductively. Upon successful completion of Part 1, students would be expected to enroll in Part 2. Students must successfully complete both Geometry Part I and Part II in order to meet the state requirements for Geometry under the Standards of Learning. The Geometry Standard of Learning test will be given upon completion of Geometry Part II.

Essential Skills/Processes:

Students develop an understanding of the reasoning process and the concept of proof. Properties and relationships of lines, angles, and triangles are developed inductively and then verified deductively. Topics included conditional statements, syllogisms, points in space, parallel lines, transversals, planes, congruence, the Pythagorean Theorem, and similarity.

Algebra and technologies are used as tools to solve geometry problems. Opportunities are provided for discovery learning through hands-on activities and experiences that allow for utilizing technology to explore major concepts and develop problem-solving skills. Any technology that will enhance student learning should be used.

This course includes an integrated review of algebraic topics needed in geometry. Some Algebra 1 Virginia Standards of Learning are addressed and reviewed in this course.

Essential Knowledge:

Reasoning, Lines and Transformations

- Construct and judge the validity of a logical argument consisting of a set of premises and a conclusion including identifying the converse, inverse, and contrapositive of a conditional statement; translating a short verbal argument into symbolic form, using Venn diagrams to represent set relationships and using deductive reasoning.
- Use the relationships between angles formed by two lines cut by a transversal to determine whether two lines are parallel, verify the parallelism, using algebraic and coordinate methods as well as deductive proofs
- Solve real-world problems involving angles formed when parallel lines are cut by a transversal
- Use pictorial representations, including computer software, constructions, and coordinate methods, to solve problems involving symmetry and transformation.
- Investigate and use formulas for finding distance, midpoint, and slope
- Apply slope to verify and determine whether lines are parallel or perpendicular
- Investigate symmetry and determining whether a figure is symmetric with respect to a line or a point
- Determine whether a figure has been translated, reflected, rotated, or dilated, using coordinate methods
- Construct and justify the constructions of a line segment congruent to a given line segment; the perpendicular bisector of a line segment; a perpendicular to a given line from a point not on the line; a perpendicular to a given line at a given point on the line; the bisector of a given angle, an angle congruent to a given angle; and a line parallel to a given line through a point not on the given line

Triangles

- Given information concerning the lengths of sides and/or measures of angles in triangles, will order the sides by length, given the angle measures; order the angles by degree measure, given the side lengths; determine whether a triangle exists; and determine the range in which the length of the third side must lie
These concepts will be considered in the context of real-world situations.
- Given information in the form of a figure or statement, will prove two triangles are congruent, using algebraic and coordinate methods as well as deductive proofs
- Given information in the form of a figure or statement, will prove two triangles are similar, using algebraic and coordinate methods as well as deductive proofs

- Solve real-world problems involving right triangles by using the Pythagorean Theorem and its converse, properties of special right triangles, and right triangle trigonometry

Polygons, Circles and Three-Dimensional Figures

- Verify characteristics of quadrilaterals and use properties of quadrilaterals to solve real-world problems
- Solve real-world problems involving angles of polygons.
- Use angles, arcs, chords, tangents, and secants to investigate, verify, and apply properties of circles; solve real-world problems involving properties of circles; and find arc lengths and areas of sectors in circles
- Given the coordinates of the center of a circle and a point on the circle, will write the equation of the circle
- Use formulas for surface area and volume of three-dimensional objects to solve real-world problems
- Use similar geometric objects in two- or three-dimensions to compare ratios between side lengths, perimeters, areas, and volumes; determine how changes in one or more dimensions of an object affect area and/or volume of the object; determine how changes in area and/or volume of an object affect one or more dimensions of the object; and solve real-world problems about similar geometric objects

Resources:

- Stafford County Public Schools: <http://stafford.schoolfusion.us/> .
- High School Course Catalog: <http://stafford.schoolfusion.us/> . Click on “For Parents/Students” tab.
- VA Mathematics Standards of Learning:
http://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/index.shtml
- School Report Card (VA Department of Education):
http://www.doe.virginia.gov/statistics_reports/school_report_card/index.shtml
- Prentice Hall textbook: http://phschool.com/atschool/phmath/program_page.html