Parent / Student Course Information

MATHEMATICS

GEOMETRY (X)

Counselors are available to assist parents and students with course selections and career planning. Parents may arrange to meet with the counselor by calling the school's guidance department.

COURSE DESCRIPTION
Geometry (X) is the last course in a sequence designed for students to meet the graduation requirement of Geometry. It is designed to provide a sequence of topics which ensures thorough treatment of standard geometry skills and concepts. Opportunities are provided for the students to gain an appreciation of the structure of geometry, to develop powers of spatial visualization, and to appreciate the need for clarity and precision of language in mathematics. The course develops the logic of geometry, helping students to justify conclusions based on geometric definitions, theorems, and postulates. In addition to the development of geometry, the course includes trigonometry, constructions, and coordinate geometry. Students will take the Standards of Learning Test for Geometry or a substitute test approved by the State Board of Education. Specific dates for the spring, summer, or fall SOL test will be announced by the school. **Students cannot receive credit for both Geometry (X) and Geometry (MA 3143).**

PREREQUISITE
Introduction to Geometry

OPTIONS FOR NEXT COURSE
Algebra, Functions, and Data Analysis, Algebra II, or Computer Programming

REQUIRED STUDENT TEXTBOOK
Glencoe Geometry (Virginia Edition). John A. Carter, Ph.D., Gilbert J. Cuevas, Ph.D., Roger Day, Ph.D., and Carol Malloy, Ph.D. Glencoe McGraw-Hill, 2012

RECOMMENDED CALCULATOR
TI-83 Plus or TI-84 Plus

Students should purchase a compass, ruler, and protractor.

Virginia Beach Instructional Objectives*
Geometry (X) – MA 3158

*Due to the course sequence changes and implementation of the new 2009 SOLs this year, Geometry (X) will reference the Geometry Part 1 and Part 2 VBOs aligned to the new Virginia Standards of Learning.

School Net Objective	Objective
	REVIEW: Foundations of Geometry (*these objectives shown in italics were previously introduced during the Introduction to Geometry course and will be reviewed only*)
GP1.RL.1.1	*The student will identify a point, line, ray, angle, line segment, and plane when given an appropriate diagram and use standard notation for each.*
GP1.RL.1.2	*The student will use the definitions, theorems, postulates, and pictorial representations to draw conclusions about line segments and angles, including: linear measure, using the distance and midpoint formulas, using the segment addition postulate and angle addition postulate.* ***(SOL G.3 a)***
GP1.RL.1.3	*The student will apply the definitions and theorems for complementary, supplementary, right, straight, vertical, and adjacent angles to real-world problems.*
GP1.RL.1.4	*The student will apply the definitions and relationships of perpendicular lines in real-world situations.* ***(SOL G.3 a, b)***
GP1.RL.1.5	*The student will construct a line segment congruent to a given line segment, the perpendicular bisector of a line segment, an angle congruent to a given angle, and the bisector of an angle.* ***(SOL G.4 a, b, e, f)***
	REVIEW: Reasoning and Proof *(these objectives shown in italics were previously introduced during the Introduction to Geometry course and will be reviewed only)*
GP1.RL.2.1	*The student will diagram arguments involving quantifiers using Venn Diagrams, identify the hypothesis and conclusion of a conditional statement (including statements involving quantifiers such as all, no, none, and some) and write it and its converse in if-then form.* ***(SOL G.1 a, c)***
GP1.RL.2.2	*The student will construct and judge the validity of a logical argument consisting of a set of premises and a conclusion, including: being able to define and state the converse, inverse, and contrapositive of an if-then statement; translating short verbal arguments into symbolic form; and use valid forms of inductive and deductive reasoning to include real-world problems.* ***(SOL G.1 a, b, d)***
GP1.RL.2.3	*The student will solve problems by drawing conclusions about points, lines, planes, and angles and justify statements using definitions, theorems, and postulates using properties of equality and problem-solving techniques.*
	REVIEW: Lines and Their Relationships *(these objectives shown in italics were previously introduced during the Introduction to Geometry course and will be reviewed only)*
GP1.RL.3.1	*The student will draw conclusions that lines and/or planes are parallel and show the relationships between pairs of angles in real-world situations, including using definitions of parallel, perpendicular, and skew lines; using the definition of transversal and the types of angles formed; justifying parallel lines and/or planes using algebraic and coordinate methods, including slope and equations and deductive proofs.* ***(SOL G.2 a, b, c, G.3 a, b)***
GP1.RL.3.2	*The student will construct the perpendicular segment to a given line from a point not on the line, the perpendicular segment to a given line from a point on the line, and a line parallel to a given line through a point not on the given line.* ***(SOL G.4 c, d, g)***

	REVIEW: Triangles and Their Relationships *(these objectives shown in italics were previously introduced during the Introduction to Geometry course and will be reviewed only)*
GP1.TR.4.1	*The student will apply properties of triangles including: classifying triangles based on sides and angles; applying the triangle sum theorem; and applying the exterior-angle theorem, in real-world situations.*
GP1.TR.4.2	*The student will show that triangles are congruent by SSS, SAS, ASA, AAS, or HL using algebraic and coordinate methods as well as deductive proofs.* ***(SOL G.6)***
GP1.TR.4.3	*The student will draw conclusions about segments or angles using the corresponding parts of congruent triangles theorem, including the use of altitude and median of a triangle and overlapping triangles.* ***(SOL G.6)***
GP1.TR.4.4	*The student will apply the inequality relationships for angles or sides of one or two triangles in real-world situations, including ordering the sides and angles of a triangle.* ***(SOL G.5 a, b, c, d)***
	Similarity
GP2.TR.5.1	The student will use the properties of similar polygons, including: identifying corresponding parts of similar polygons; writing equivalent proportions; and applying proportions to solve real-world problems. **(SOL G.14 a, b, c, d)**
GP2.TR.5.2	The student will show that triangles are similar by AA, SAS, or SSS using algebraic and coordinate methods as well as deductive proofs, including: investigating and identifying similarity between triangles and computing lengths of segments of similar triangles. **(SOL G.7)**
	Right Triangles
GP2.TR.6.1	The student will use the Pythagorean Theorem and its converse to solve problems and recognize Pythagorean triples. **(SOL G.8)**
GP2.TR.6.2	The student will apply properties of special right triangles to real-world problems and find decimal approximations for the solutions. **(SOL G.8)**
GP2.TR.6.3	The student will solve real-world problems using sine, cosine, and tangent functions of acute angles in right triangles. **(SOL G.8)**
	Polygons and Quadrilaterals
GP2.PC.7.1	The student will use measurements of interior and exterior angles of convex and regular polygons to solve problems. **(SOL G.10)**
GP2.PC.7.2	The student will classify a given quadrilateral as a parallelogram, rectangle, rhombus, square, or trapezoid according to its properties and justify the conclusion. **(SOL G.9)**
GP2.PC.7.3	The student will investigate and identify properties of quadrilaterals and use them to solve real-world problems and prove properties of quadrilaterals using algebraic and coordinate methods as well as deductive proofs. **(SOL G.2 b, G.9)**
	Transformations
GP2.RL.8.1	The student will determine the image of a figure under a dilation, reflection, rotation, or translation, including defining image, preimage, mapping, identity mapping, inverse of a mapping, and isometry. **(SOL G.3 c, d)**
GP2.RL.8.2	The student will determine if a figure has point or line symmetry and identify how many lines of symmetry exist. **(SOL G.3 a, c, d)**
GP2.RL.8.3	The student will identify the image of an object on the coordinate plane under a dilation through the origin, a rotation through the origin, a reflection through a line, and a translation. **(SOL G.3)**
	Circles
GP2.PC.9.1	The student will investigate and use the properties of angles, arcs, chords, tangents, and secants including: defining, identifying, and using standard notation for chord, secant, tangent, major and minor arc, intercepted arc, and central and inscribed angle; defining congruent arcs, congruent circles, concentric circles, and common tangent.

	(SOL G.11 a, b, c)
GP2.PC.9.2	The student will apply properties of circles to real-world problems, including: solving problems using angles formed by radii, chords, secants, and tangents; and solving problems using the lengths of arcs, chords, secant segments, and tangent segments. **(SOL G.11 a, b, c)**
GP2.PC.9.3	The student will calculate circumference and arc length and relate measures of central angles to fractions of a circle. **(SOL G.11 c)**
GP2.PC.9.4	The student, given the coordinates of the center of a circle and a point on the circle, will write the equation of the circle. **(SOL G.12)**
	Area and Volume
GP2.PC.10.1	The student will calculate the area of a triangle, rectangle, rhombus, square, trapezoid, and parallelogram and apply this knowledge to find the area of other polygons. **(SOL G.14)**
GP2.PC.10.2	The student will calculate area of a circle and area of a sector of a circle given the measure of its central angle. **(SOL G.11 b, c)**
GP2.3D.10.3	The student will calculate the lateral area, surface area, and volume of three dimensional objects. **(SOL G.13)**
GP2.3D.10.4	The student will calculate the ratio of the areas or the volumes of similar figures in terms of the ratio of the sides or perimeters and investigate relationships between linear, square, and cubic measures of similar geometric objects and describe how changes in one measure affect the others, including real-world applications. **(SOL G.14 a, b, c, d)**
	Geometry Extensions and Advanced Algebra Concepts
GP2.TR.11.1	The student will solve real-world problems using the Laws of Sines and Cosines.

VIRGINIA BEACH CITY PUBLIC SCHOOLS
AHEAD OF THE CURVE

MISSION STATEMENT

The Virginia Beach City Public Schools, in partnership with the entire community, will empower every student to become a life-long learner who is a responsible, productive and engaged citizen within the global community.

DEPARTMENT OF CURRICULUM AND INSTRUCTION
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