

**FAME Public Charter School**  
**Course Description**  
**Geometry**

**Description:**

This is a comprehensive course covering geometric terms and the mathematical study of two-dimensional shapes and objects. Students learn basic theorems and proofs to develop an understanding of Geometry. The following topics will be covered: lines and angles, triangles, polygons, perimeter and area, ratio and proportion, parts of circles, chords, secants, tangents, prisms, right circular cylinders, pyramids, cones, spheres, slope, and equations of lines. Pre-Requisites: Grade of “C” or better in Algebra I

**Course Objectives**

The geometry skills and concepts developed in this discipline are useful to all students. Aside from learning these skills and concepts, students will develop their ability to construct formal, logical arguments and proofs in geometric settings and problems.

**Course Goals and/or Major Student Outcomes**

Coursework will include a thorough understanding and application of the following topics:

- Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.
- Students write geometric proofs, including proofs by contradiction.
- Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.
- Students prove basic theorems involving congruence and similarity.
- Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.
- Students know and are able to use the triangle inequality theorem.
- Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.
- Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.
- Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres.
- Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids. Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.
- Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.
- Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.
- Students prove the Pythagorean theorem.
- Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.

- Students perform basic constructions with a straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line.
- Students prove theorems by using coordinate geometry, including the midpoint of a line segment, the distance formula, and various forms of equations of lines and circles.
- Students know the definitions of the basic trigonometric functions defined by the angles of a right triangle. They also know and are able to use elementary relationships between them.
- Students use trigonometric functions to solve for an unknown length of a side of a right triangle, given an angle and a length of a side.
- Students know and are able to use angle and side relationships in problems with special right triangles, such as  $30^\circ$ ,  $60^\circ$ , and  $90^\circ$  triangles and  $45^\circ$ ,  $45^\circ$ , and  $90^\circ$  triangles.
- Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.
- Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.

**Key Assignments and Assessment:**

Unit by Unit problem Sets  
 End of Chapter Tests  
 Final Examination

**Grading Scale:**

20%  
 60%  
 20%

**Curriculum:**

May be selected from the following:

- \*Textbook, Jacobs, Harold, Geometry
- \*Textbook, Addison-Wesley, Focus on Geometry\*\*\*
- \*Textbook, Prentice-Hall, Geometry, Tools for a Changing World
- \*Textbook, Glencoe, Geometry: Integration, Applications, Connections, 1998
- \*Textbook, Glencoe, Merrill Geometry: Applications and Connections, 1995
- \*North Dakota Independent Study, Geometry, semesters 1 and 2, text or online
- \*University Nebraska-Lincoln I.S.H.S., Geometry, MTHH 035/036
- \*Laurel Springs, Geometry Text or Online course 9-11<sup>th</sup> grade

\*\*\*Designed for students who struggle with a traditional instructional approach

This is a one-year course, 5 credits each semester will be awarded with a passing grade.

**NOTE:** Students wishing to use Saxon curriculum must follow the Geometry w/advanced Math course description found under the college prep course section of this manual.

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