

## FAME Public Charter School A-G Course Template

Course Title: a-g Geometry

Prerequisite: Algebra 1 with a C or better

**Brief Course Description** - Briefly (in a short paragraph) describe the course focusing on content. This should look like something you would see in a course catalog. Type the information in the text box below. All text boxes will expand as needed.

Geometry is a fundamental high school math course in which students develop their reasoning ability to construct formal, logical arguments and proofs in geometric settings and problems. Students are introduced to the essentials of Euclidean geometry by examining two and three-dimensional geometric figures and their properties, geometric constructions, deduction and induction, and drawing conclusions. Proficiency is developed in performing basic constructions with a straightedge and compass.

### Textbooks

Include list of Primary and Secondary Texts. Make sure to note the books that will be read entirely and those that will be as excerpts. Textbook information is not necessary if your course is a Visual and Performing Arts course. Online texts or non-standard text materials should include a link to the online text.

#### Primary Textbooks

Title: Geometry (California Edition)

ISBN: 061881194X

Edition:

Publication Date: 2007

Publisher: McDougal Littell

Author(s): Larson, Boswell, Kanold, Stiff

URL Resource(s): CLASSZONE.com

or

Title: Geometry

ISBN: 0133659488

Edition:

Publication Date: 2009

Publisher: Prentice Hall

Author(s):

URL Resource(s):

or

Title: Geometry

ISBN: 0078884845

Edition:

Publication Date: 2009

Publisher: Glencoe McGraw Hill

Author(s):

URL Resource(s):

**Supplemental Instructional Materials** - Please describe. If using online text or non-standard material, please provide the title of the material or webpage and the URL link.

Teacher's Edition ISBN for McDougal Littell Geometry Ca Edition: 9780618811915  
Teacher's Edition ISBN for Prentice Hall Geometry: 0133659526  
Teacher's Edition ISBN for Glencoe McGraw Hill Geometry: 0078884853

### Additional a-g Approved Course Options

NUVHS Geometry A/B

## Course Objectives – what the students will know at the end of the course

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 Major Student Outcomes – what the students will be able to do at the end of the course

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.

Course Outline by Units of Study – the content you will cover arranged in units

- Points, Lines, Planes, and Angles
  - Basic figures-Points, Lines, and Planes
  - Definitions and Postulates-Segments, Rays, Distance, and angles and Postulates and Theorems relating points, lines, and planes
- Deductive Reasoning
  - Using Deductive reasoning-If-then statements; Converses and Properties from Algebra and Proving theorems
  - Theorems about Angles and Perpendicular Lines-Special pairs of angles and Perpendicular lines and Planning a proof
- Parallel lines and planes
  - When lines and planes are parallel-Definitions, properties of parallel lines and proofs
  - Applying parallel lines to polygons-Angles of a triangle, polygon and inductive reasoning
- Congruent Triangles
  - Corresponding parts in a congruence
  - Theorems based on congruent triangles
  - Proofs
- Quadrilaterals
  - Parallelograms
  - Special Quadrilaterals
- Inequalities in geometry
  - Inequalities and indirect proof
  - Inequalities in triangles
- Similar Polygons
  - Ratio, proportion, and similarity
  - Working with similar triangles
- Right triangles
  - Pythagorean theorem
  - Trigonometry
- Circles
  - Tangents, Arcs, and Chords
  - Angles and segments
- Constructions and Loci
  - Basic constructions and locus
- Areas of Plane figures
  - Areas of polygons
  - Circles, similar figures and geometric probability

- Areas and volumes of solids
  - Prisms, Pyramids, Cylinders and Cones
  - Spheres
- Coordinated Geometry
- Transformations

#### Key Assignments

- Unit by Unit problem sets
- End of Chapter tests
- Finals required at mid-term and end of year

#### Instructional Methods and Strategies

Instruction may include the following:

- Lecture/Demonstration
- Discussion
- Text Reading and Practices
- Personal Tutoring
- CD Rom
- Internet Research

#### Assessment Methods and Strategies

Assessment tools include the following, but are not limited to:

- Monthly review of student work by the Independent Study Teacher.
- Chapter and Unit tests and examinations.
- Student grades on text practices and standardized tests
- Written state examinations
- Oral communication with Independent Study Teacher.
- Final Examination.