

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

**Course Outline
Honors Geometry**

Date: May 2003

Subject Area: Mathematics

Proposed Grade Level(s): 9-12

Course Length: 1 Year

Grading: A-F

Number of Credits: 5/Semester

Prerequisites: 'A' or strong 'B' in Algebra 1 and teacher recommendation; 80% minimum on District Algebra 1 Final

BRIEF COURSE DESCRIPTION:

Students will complete a formal course in Geometry with emphasis on the axiomatic nature of math, which includes in-depth study of proof. Topics covered include parallel lines, perpendicular lines and planes; congruent and similar figures; quadrilaterals; right triangle trigonometry; circles; constructions and loci; area and volume; coordinate geometry; and transformations. An additional unit covering the Conic Sections will be included in the honors geometry course.

GENERAL GOALS/PURPOSES:

According to the state standards, the main purpose of the geometry curriculum is to develop geometric skills and concepts and the ability to construct formal logical arguments and proofs in a geometric setting. Honors Geometry differs from Geometry in its emphasis on formal structure and proof. Additionally, Honors Geometry covers considerably more content often with greater depth than the Geometry course.

STUDENT READING COMPONENT:

Students will receive instruction on the effective use of their textbook. Geometry includes many applications where effective reading and analysis are taught as part of the course. Geometry places a heavy emphasis on vocabulary and its role in developing an axiomatic system. As students develop their ability to create a formal logical argument, they will also be developing their ability to read analytically.

STUDENT WRITING/ORAL COMPONENT:

One of the primary skills to be developed in Geometry is the ability to construct formal logical arguments and proofs. The development of this skill is a critical part of a student's ability to create a persuasive argument in any setting and in any subject. Additionally, students will have opportunities to express their understanding of a variety of geometric concepts in writing as well as presenting work orally to the class. All written work will follow standard rules of English. Any research projects will follow MLA format, which has been distributed at all secondary sites.

Final Assessment:

District Geometry Final sent to the school sites from Granite Center in June. It is also recommended, but not required, that each school site generate a common trimester 1 & 2 or semester 1 final for that site.

DETAILED UNITS OF INSTRUCTION: (CA state standards for geometry indicated in parenthesis)

1. Points, Lines, Planes, and Angles (1.0)
 - a. Points, Lines, and Planes
 - b. Segments, Rays, and Distance
 - c. Angles
 - d. Postulates and Theorems relating points, lines and planes
2. Deductive Reasoning (1.0, 2.0, 3.0)
 - a. If-Then Statements
 - b. Converse Statements
 - c. Properties from Algebra
 - d. Proving Theorems
 - e. Theorems about angles and perpendicular lines
3. Parallel Lines and Planes (7.0)
 - a. Properties of parallel lines
 - b. Proving lines are parallel
 - c. Applying parallel lines to polygons
 1. Angles of a triangle
 2. Angles of a polygon
 3. Deductive Reasoning
4. Congruent Triangles (4.0, 5.0, 6.0, 12.0)
 - a. Congruent Figures
 - b. Using Congruent Triangles
 - c. Isosceles Triangle Theorem
 - d. Proving Triangles Congruent
 - e. Medians, Altitudes, and Perpendicular Bisectors
5. Quadrilaterals (4.0, 7.0, 13.0)
 - a. Properties of parallelograms
 - b. Theorems involving parallelograms
 - c. Special Parallelograms
 - d. Trapezoids
6. Inequalities in Geometry (3.0, 6.0)
 - a. Inequalities
 - b. Inverses and Contrapositives
 - c. Indirect Proof
 - d. Inequalities for one triangle
 - e. Inequalities for two triangles
7. Similar Polygons (4.0, 5.0)
 - a. Ratio and proportion
 - b. Properties of proportions
 - c. Similar Polygons
 - d. Postulate for similar triangles
 - e. Theorems for similar triangles
 - f. Proportional lengths
8. Right Triangles (14.0, 15.0, 18, 19.0, 20.0)
 - a. Similarities in Right Triangles
 - b. Pythagorean Theorem and its converse
 - c. Special Right Triangles
 - d. Sine, Cosine, and Tangent functions and their graphs
 - e. Applications of Right Triangle Trig
9. Circles (7.0, 21.0)

- a. Basic terms
 - b. Theorems about tangents
 - c. Arcs, Central Angles, and Chords
 - d. Inscribed Angles, angles formed by secant segments and tangent segments
 - e. Circles and lengths of segments
10. Constructions and loci (16.0)
- a. Angles and segments
 - b. Perpendiculars and parallels
 - c. Concurrent lines
 - d. Inscribed and circumscribed circles
 - e. Dividing segments
 - f. Locus definition problems
11. Areas of Plane Figures (8.0, 10.0)
- a. Rectangles, Triangles, Parallelograms, Rhombuses, and Trapezoids
 - b. Regular Polygons
 - c. Circumferences and Areas of Circles
 - d. Arc lengths and areas of sectors
 - e. Ratios of Areas
 - f. Geometric Probability
12. Areas and Volumes of Solids (8.0, 9.0, 10.0)
- a. Prisms and Pyramids
 - b. Cylinders and Cones
 - c. Spheres
 - d. Areas and Volumes of Similar Solids
13. Coordinate Geometry (17.0)
- a. Distance Formula
 - b. Slope
 - c. Parallel and Perpendicular lines
 - d. Vectors
 - e. Midpoint formula
 - f. Graphing linear equations
 - g. Writing linear equations
 - h. Coordinate Proofs
14. Transformations (22.0)
- a. Mappings and functions
 - b. Reflections
 - c. Translations and glide reflections
 - d. Rotations
 - e. Dilations
 - f. Composites of mappings
 - g. Inverses and the Identity
 - h. Symmetry in the plane and in space
15. Conic Sections (Algebra 2: 9.0, 16.0, 17.0)
- a. Introduction to Conics
 - b. Each of the following conic figures includes: locus definition, standard and general form, graphing, identifying all key parts (asymptotes, major/minor axes etc.)
 - 1. Parabola
 - 2. Circle
 - 3. Ellipse
 - 4. Hyperbola

THIS COURSE WILL PREPARE STUDENTS FOR THE HSEE AND/OR FCUSD EXIT EXAM IN:

Math

LAB FEE, IF REQUIRED: None

SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED: See “Detailed Units of Instruction”.

Note: In this class, CA mathematics standards from Geometry and Algebra 2 will be addressed.

DISTRICT ESLRs TO BE ADDRESSED:

When students exit a secondary mathematics course, they will be:

- **Self-directed Learners** who will be able to use notes and a textbook to assist them in continuing their learning outside of the classroom setting.
- **Efficient Communicators** who can explain mathematical concepts to others and use mathematics to organize and explain data.
- **Quality Producers** who understand the importance of neat, organized work that demonstrates their thinking and understanding of the solution they've formed to solve a problem.
- **Constructive Thinkers** who are able to attack problems with organization, logic, and mathematical skills they've developed in a systematic fashion.
- **Collaborative Workers** who can work in a variety of settings in culturally diverse groups. They will be able to form and use study groups to strengthen their own understanding in addition to providing the same service for classmates.
- **Responsible Citizens** who accept the consequences of their actions and who demonstrate their understanding of their role in the learning process.