

Orange Unified School District

GEOMETRY

Year Course

GRADE LEVEL: 9-12

PREREQUISITES: Successful completion of Algebra 1 or Algebra 1B with a C or better.

INTRODUCTION TO THE SUBJECT:

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

COURSE OBJECTIVES:

To prepare students for more rigorous, higher level mathematics courses at the high school and college level.

BY THE END OF THE COURSE THE STUDENT WILL BE ABLE TO:

Apply their knowledge of the geometry content standards to demonstrate proficiency on the California State Standards Assessment. Students will also be able to continue their mathematics education at the high school level with confidence and consistency.

COURSE OVERVIEW AND APPROXIMATE UNIT TIME ALLOTMENTS:

Based on the adopted geometry text as of 2005. (California Content Standards for Geometry are denoted in **bold**)

FIRST SEMESTER

	<u>DAYS</u>
I. Chapter 1 (1, 8, 11, 15, 16)	14
A. Points, lines, and planes	
B. Measuring segments, rays, and angles	
C. Perimeter of polygons	
II. Chapter 2 (1)	15
A. Inductive and deductive reasoning, logic, conditional, and proofs	
III. Chapter 3 (7, 2)	12
A. Parallel lines, slopes, proving lines parallel	

DAYS

IV.	Chapter 4 (2, 4, 5, 12)	15
	A. Classifying triangles, angle theorems, proving congruence	
	B. Isosceles and equilateral triangles, triangles on a coordinate plane	
V.	Chapter 5 (2, 6, 12, 13)	11
	A. Parts of triangles, indirect proof, and triangle inequality theorem	
VI.	Chapter 6 – <i>Skip section 6.6 Fractals</i> (2, 3, 4, 5, 7, 8, 11, 12)	12
	A. Ratio/proportions, similarity, proportional parts of triangles	
VII.	Chapter 7 – <i>Skip sections 7.6 and 7.7 Laws of Sines and Cosines</i> (2, 4, 12, 14, 15, 18, 19, 20)	10
	A. Trigonometry, geometric mean, Pythagorean theorem	
	B. Special right triangles, elevation and depression	
	Total Days 1 st Semester:	89

SECOND SEMESTER

I.	Chapter 8 (2, 3, 12, 16, 17)	15
	A. Quadrilaterals	
II.	Chapter 9 – <i>Skip sections 9.6 and 9.7 Vectors and Matrices</i> <i>Optional section 9.4 Tessellations</i> (11, 22)	10
	A. Transformations – rigid and dilation	
III.	Chapter 10 (7, 8, 16, 17, 21)	11
	A. Circles – arcs, inscribed angles, tangent, secant	
IV.	Chapter 11 – <i>Skip section 11.5 Geometric Probability</i> (8, 10, 11)	10
	A. Area of parallelogram, triangle, trapezoid, rhombus,	
	B. Regular/irregular polygons and circles	
V.	Chapter 12 – <i>Suggest combining sections 12.1 and 12.2 into one day</i> (8, 9)	10
	A. Surface area of prisms, cones, cylinders, and spheres	
VI.	Chapter 13 - <i>Skip section 13.5 Coordinates in Space</i> (8, 9, 11)	10
	A. Volume	
VII.	Preparation for Higher Level Math	
	A. Law of sines and cosines – <i>Sections 7.6, 7.7</i>	4
	B. Tessellations – <i>Section 9.4</i>	4
	C. Fractals – <i>Section 6.6</i>	4
	D. Vectors and matrices – <i>Sections 9.6, 9.7</i>	4
VIII.	Review and Assessment	<u>9</u>
	Total Days 2 nd Semester	91

DATE OF LAST CONTENT REVISION:

August 2000

DATE OF CURRENT CONTENT REVISION: August 2005

DATE OF BOARD APPROVAL: October 13, 2005

Addendum
THE CALIFORNIA CONTENT STANDARDS
GEOMETRY

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.

- 1.0** Students demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning.
- 2.0** Students write geometric proofs, including proofs by contradiction.
- 3.0** Students construct and judge the validity of a logical argument and give counterexamples to disprove a statement.
- 4.0** Students prove basic theorems involving congruence and similarity.
- 5.0** Students prove that triangles are congruent or similar, and they are able to use the concept of corresponding parts of congruent triangles.
- 6.0** Students know and are able to use the triangle inequality theorem.
- 7.0** Students prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles.
- 8.0** Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures.
- 9.0** Students compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and students commit to memory the formulas for prisms, pyramids, and cylinders.
- 10.0** Students compute areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids.
- 11.0** Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids.

- 12.0** Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems.
- 13.0** Students prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles.
- 14.0** Students prove the Pythagorean theorem.
- 15.0** Students use the Pythagorean theorem to determine distance and find missing lengths of sides of right triangles.
- 16.0** 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.
- 17.0** 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.
- 18.0** 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. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$.
- 19.0** 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.
- 20.0** Students know and are able to use angle and side relationships in problems with special right triangles, such as 30° , 60° , and 90° triangles and 45° , 45° , and 90° triangles.
- 21.0** Students prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles.
- 22.0** Students know the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections.

