

**MT. DIABLO UNIFIED SCHOOL DISTRICT
COURSE OF STUDY**

DRAFT

COURSE TITLE:	Geometry
COURSE NUMBER:	1320
CALPADS NUMBER:	2413
CST:	Geometry
DEPARTMENT:	Mathematics
NCLB TEACHER CREDENTIAL REQUIREMENT:	Math Credential with Subject Matter Proficiency
LENGTH OF COURSE:	One Year
CREDITS PER SEMESTER:	5
GRADE LEVEL(S):	8-12
REQUIRED OR ELECTIVE:	This course fulfills one year of the high school mathematics requirement and UC/CSU “c” requirement. Eighth grade students do not receive high school credit for this course.
PREREQUISITES:	Successful completion of Algebra I. Concurrent support recommended for students who received a D in Algebra 1.

BOARD OF EDUCATION ADOPTION:

COURSE DESCRIPTION:

This course provides the student with the knowledge, concepts and skills identified in the California State Mathematics Standards for Geometry. The ability to communicate mathematical reasoning and understanding will be incorporated into all math topics. In addition, students will develop their ability to construct formal, logical arguments and proofs in geometric settings and problems. This course is the second course in the three year mathematics requirement for four-year college admission.

1. MAJOR GOALS

- 1.1 To develop the ability to reason logically and think spatially
- 1.2 To develop skills for communicating mathematically
- 1.3 To build geometric models, formulate and solve problems
- 1.4 To improve the skills necessary to be successful in multiple careers

2. PERFORMANCE OBJECTIVES:

(numbers in parentheses refers to an appropriate California State Standard)

2.1 Geometry

- 2.1.1 Demonstrate understanding by identifying and giving examples of undefined terms, axioms, theorems, and inductive and deductive reasoning. (1.0)
- 2.1.2 Write geometric proofs, including proofs by contradiction. (2.0)
- 2.1.3 Construct and judge the validity of a logical argument and give counterexamples to disprove a statement. (3.0)

- 2.1.4 Prove basic theorems involving congruence and similarity. (4.0)
- 2.1.5 Prove that triangles are congruent or similar, and be able to use the concept of corresponding parts of congruent triangles. (5.0)
- 2.1.6 Demonstrate knowledge of the triangle inequality theorem. (6.0)
- 2.1.7 Prove and use theorems involving the properties of parallel lines cut by a transversal, the properties of quadrilaterals, and the properties of circles (7.0)
- 2.1.8 Know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral area, and surface area of common geometric figures. (8.0)
- 2.1.9 Compute the volumes and surface areas of prisms, pyramids, cylinders, cones, and spheres; and commit to memory the formulas for prisms, pyramids, and cylinders. (9.0)
- 2.1.10 Compute the areas of polygons, including rectangles, scalene triangles, equilateral triangles, rhombi, parallelograms, and trapezoids. (10.0)
- 2.1.11 Determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids. (11.0)
- 2.1.12 Find and use the measures of sided and of interior and exterior angles of triangles and polygons to classify figures and solve problems. (12.0)
- 2.1.13 Prove relationships between angles in polygons by using properties of complementary, supplementary, vertical, and exterior angles. (13.0)
- 2.1.14 Prove the Pythagorean Theorem. (14.0)
- 2.1.15 Use the Pythagorean Theorem to determine distance and find missing lengths of sides of right triangles. (15.0)
- 2.1.16 Perform basic constructions with straightedge and compass, such as angle bisectors, perpendicular bisectors, and the line parallel to a given line through a point off the line. (16.0)
- 2.1.17 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. (17.0)
- 2.1.18 Demonstrate knowledge of the definitions of the basic trigonometric functions defined by the angles of a right triangle. Understand and use elementary relationships between trigonometric functions and right triangles. For example, $\tan(x) = \sin(x)/\cos(x)$, $(\sin(x))^2 + (\cos(x))^2 = 1$. (18.0)
- 2.1.19 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. (19.0)
- 2.1.20 Demonstrate knowledge of and ability to use angle and side relationships in problems with special right triangles, such as 30° , 60° , and 90° triangles and 45° , 45° , 90° triangles. (20.0)
- 2.1.21 Prove and solve problems regarding relationships among chords, secants, tangents, inscribed angles, and inscribed and circumscribed polygons of circles. (21.0)
- 2.1.22 Understand the effect of rigid motions on figures in the coordinate plane and space, including rotations, translations, and reflections. (22.0)

3. CONTENT OUTLINE:

(numbers in parentheses refer to appropriate performance objectives)

3.1 Geometry

- 3.1.1 Axioms, theorems, inductive and deductive reasoning (2.1.1, 2.1.4)
- 3.1.2 Geometric proofs (2.1.2)
- 3.1.3 Logical arguments and counterexamples (2.1.3)
- 3.1.4 Properties of geometric figures including career applications (2.1.8-2.1.11, 2.1.21)
- 3.1.5 Angles of geometric figures (2.1.5-2.1.13, 2.1.20)
- 3.1.6 Pythagorean theorem including career applications (2.1.14-2.1.15)
- 3.1.7 Geometric constructions (2.1.16)
- 3.1.8 Coordinate geometry (2.1.17)
- 3.1.9 Trigonometric functions (2.1.18-2.1.19)
- 3.1.10 Transformations (2.1.22)

4. TIME ESTIMATES:

- 4.1 Instructional sequences vary in length from a few days to several weeks

5. INSTRUCTIONAL MATERIALS:

- 5.1 District adopted textbooks
- 5.2 Supplementary and teacher-created materials that may include a career focus
- 5.3 Technology materials

6. EVALUATION OF STUDENT PROGRESS:

Students communicate mathematically and demonstrate content knowledge in a variety of ways that lead to mathematical competence in their chosen careers.

- 6.1 Teacher observation
- 6.2 Written assignments and projects
- 6.3 Quizzes and tests
- 6.4 Rubrics

Committee Members:

Norma Meyerkorth	CHS
Brianne Whiteside	CHS
Suzette Blanke	CPHS
Robert Lovelace	CPHS
Angel Niedzielski	CPHS
Frank Bruketta	CVHS
Danielle Dell	CVHS
Susan Seeley	CVHS
Bodhi Young	CVHS
Kathleen Magana	MDHS
Steve Sankey	MDHS

Judith Cubillo	NHS
Ellen Dill	NHS
Rianne Pfaltzgraff	NHS
Peri Curtis	OHS
Sharon Simone	RMS
Leslie Addiego	YVHS
Mary Ditkof	YVHS
Kelly Donlon	YVHS
John Ghiozzi	YVHS
Sandy Bruketta	Curriculum Specialist