A-G GEOMETRY A & B

COURSE TITLE/ TRANSCRIPT CODE
a - g Geometry A 5E1005
a - g Geometry B 5E1009

COURSE DESCRIPTION
This Geometry course is designed to develop students' higher order thinking skills, organizational adeptness, and argument presentation. It also provides ideas and formulas needed for higher level classes and many occupations. The key concepts are: deductive reasoning, parallel lines and planes, isosceles triangles, and similarity and similar polygons.

PREREQUISITES:
Algebra 1 with a grade of "C" or better.

REQUIRED TEXTBOOK:

HOLT CALIFORNIA GEOMETRY; California Student Edition, 2008, Holt, Rinehart and Winston

COURSE PURPOSE:
In this course students will:
- Master the California Mathematics Content Standards for Geometry.
- Develop higher order thinking skills.
- Develop organizational adeptness.
- Develop argument presentation
- Acquire ideas and formulas needed for higher level classes and many occupations.

COURSE OUTLINE:
Chapter titles (CA Content Standard for Geometry covered)
Topics
1. Foundations for Geometry (1.0, 8.0, 16.0, 22.0)
- Euclidean and Construction Tools (Understanding points, lines, and planes; explorations of properties associated with points; measuring and constructing segments; measuring and constructing angles; pairs of angles)
- Coordinate and Transformation Tools (Using formulas in geometry, midpoint and distance in the coordinate plane, transformations in the coordinate plane, exploring transformations)

2. Geometric Reasoning (1.0, 2.0, 3.0)
- Inductive and Deductive Reasoning (Using inductive reasoning to make conjectures, conditional statements, using deductive reasoning to verify conjectures, solving logic puzzles, biconditional statements and definitions)
- Mathematical Proof (Algebraic proof, geometric proof, designing plans for proofs, flowchart and paragraph proofs, introduction to symbolic logic)

3. Parallel and Perpendicular Lines (1.0, 2.0, 7.0, 16.0)
- Lines with Transversals (Lines and angles; exploring parallel lines and transversals,; angles formed by parallel lines and transversals; proving lines parallel; constructing parallel lines; perpendicular lines; constructing perpendicular lines)
- Coordinate Geometry (Slopes of lines, exploring parallel and perpendicular lines, lines in the coordinate plane)

4. Triangle Congruence (4.0, 5.0, 12.0, 13.0, 17.0)
- Triangles and Congruence (Classifying triangles, developing the triangle sum theorem, angle relationships in triangles, congruent triangles)
- Proving Triangle Congruence (Exploring SSS and SAS triangle congruence; predicting other triangle congruence relationships; triangle congruence: ASA, AAS, and HL; triangle congruence: CPCTC; introduction to coordinate proof, Isosceles and Equilateral triangles; providing constructions valid)

5. Properties and Attributes of the Triangles (2.0, 6.0, 14.0, 15.0, 20.0)
- Segments in Triangles (Perpendicular and angle bisectors, bisectors of triangles, medians and altitudes of triangles, special points in triangles, the Triangle Midsegment Theorem)
- Relationships in Triangles (Exploring triangle inequalities, indirect proof and inequalities in one triangle, inequalities in two triangles, hands-on proof of the Pythagorean Theorem, the Pythagorean Theorem, applying special right triangles, graphing irrational numbers)

6. Polygons and Quadrilaterals (7.0, 12.0, 15.0, 17.0)
- Polygons and Parallelograms (constructing regular polygons, properties and attributes of polygons, exploring properties of parallelograms, conditions for parallelograms)
- Other Special Quadrilaterals (Properties of special parallelograms, predicting conditions for special parallelograms, conditions for special parallelograms, exploring Isosceles trapezoids, properties of kites and trapezoids)

7. Similarity (5.0, 11.0, 12.0, 17.0)
- Similarity Relationships (Ratio and proportion, exploring the golden ratio, ratios in similar polygons, predicting triangle similarity relationships, triangle similarity: AA, SSS, and SAS)
- Applying Similarity (Investigating angle bisectors of a triangle, applying properties of similar triangles, using a proportional relationships, dilations and similarity in the coordinate plane)

8. Right Triangles and Trigonometry (4.0, 15.0, 18.0, 19.0)
- Trigonometric Ratios (Similarity in the right triangle, exploring trigonometric ratios, solving right triangles)
- Applying Trigonometric Ratios (Angles of elevation and depression, indirect measurement using trigonometry, Law of Sines and Law of Cosines, Vectors, Trigonometry and the unit circle)

9. Extending Perimeter, Circumference, and Area (8.0, 10.0, 11.0, 12.0)
- Developing Geometric Formulas (Developing formulas for triangles and quadrilaterals, developing π,

developing formulas for circles and regular polygons, composite figures, developing Pick's Theorem for area of lattice polygons)
- Applying Geometric Formulas (Perimeter and area in the coordinate plane, effects of changing dimensions proportionally, geometric probability, using geometric probability to estimate π)

10. Spatial Reasoning (1.0, 8.0, 9.0, 11.0)
- Three-Dimensional Figures (solid geometry, representations of three-dimensional figures, u sing nets to create polyhedrons, formulas in three dimensions)
- Surface Area and Volume (Surface area of prisms and cylinders, modeling right and oblique cylinders, surface area of pyramids and cones, volume of prisms and cylinders, volume of pyramids and cones, spheres, comparing surface areas and volumes, spherical geometry)

11. Circles (7.0, 16.0, 21.0)
- Lines and Arcs in Circles (Lines that intersect circles, arcs and chords, sector area and arc length)
- Angles and Segments in Circles (Inscribed angles, exploring angle relationships in circles, angle relationships in circles, exploring segment relationships in circles, segment relationships in circles, circles in the coordinate plan, polar coordinates)

12. Extending Transformational Geometry (8.0, 11.0, 22.0)
- Congruence Transformations (Reflections, translations, rotations, exploring transformations with matrices, compositions of transformations)
- Patterns (Symmetry, tessellations, using transformations to extend tessellations, dilations, using patterns to generate fractals)

KEY ASSIGNMENTS:
Student must complete these specific assignments:
1. The student will read introduction of each new topic. The student will review the examples given with their complete solutions shown and will then complete the practice problems for the new topics.
2. The student will complete daily problem sets and review sets of previous topics.
3. The student will complete the "College Entrance Exam Practice" and "Mastering the Standards" found at the end of each chapter.
4. The student will complete a minimum of three "Challenge and Extend" problems at the end of every chapter.
5. The student will take chapter tests and cumulative tests without outside assistance or use of notes or the text.
7. The student's Education Specialist and Subject Matter Expert (SME) will review work on a regular basis, and the student's written samples will be kept in a portfolio.

INSTRUCTIONAL METHODS AND/OR STRATEGIES:
Instructional methods and/or strategies may include, but are not limited, to the following techniques:
- Demonstration
- Multi-media presentations
- Textbook exercises

- Guided practice
- Tutorials
- Discussion
- Hands-on mathematical investigation
- Internet research
- Library research
- Lecture
- Regular access to a Subject Matter Expert (SME)

ASSESSMENT METHODS AND/OR TOOLS:

Methods by which student progress is assessed will be through a variety and/or combination of methods. The methods available include, but are not limited to:

- Regular review of work by Education Specialist
- Portfolios
- Parent facilitator and Education Specialist observation
- Discussion
- Demonstrations
- Student grades
- Student work examples
- Written examination
- Research projects
- Regular access to and review of work by the Subject Matter Expert (SME)