Honors Geometry

Instructors:
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This college preparatory course is designed for those students who excelled in Algebra I. Course work includes a study of the unit circle and all concepts covered in Geometry (see description for geometry) with a more in-depth analysis of the theoretical side of mathematics, along with a stronger emphasis placed on proof. Students who take this course are college prep students who want to develop a firm background for Pre-calculus and intend to take Calculus.

2 Semesters/1 Credit

Graduation Standards (the number of the standard is referenced in the performance indicators listed in each unit):

1- Reason and model quantitatively, using units and number systems to solve problems.
2- Interpret, represent, create and solve algebraic expressions.
3- Interpret, analyze, construct, and solve linear, quadratic, and trigonometric functions.
4- Prove, understand, and model geometric concepts, theorems, and constructions to solve problems.

Unit 1	Basic Definitions and Rigid Motions
Summary	In this unit, students explore the different types of transformations: reflections, translations, rotations and dilations. They learn to identify, draw, and recognize figures that have been transformed. Students will be introduced to points, lines, and angles. Accuracy of measurement will be explored, and the concept of congruency will be introduced.
Performance Indicators Assessed in Unit	2. G. Create equations that describe numbers or relationships. 4. A. Experiment with transformations in the plane. 4. D. Make geometric constructions. 4. N. Apply geometric concepts in modeling situations.

Unit 2	Lines and Angles
Summary	Students will learn how to use logic to develop various kinds of proofs, including two column and paragraph proofs. Students will also be able to identify different angle relationships created by parallel lines and a transversal.
Performance Indicators Assessed in Unit	4. C. Prove geometric theorems. 4. K. Use coordinates to prove simple geometric theorems algebraically.

Unit 3	Triangles
Summary	Students will learn how to use triangles and their properties to model and analyze many real-world situations. They will also learn about relationships in and among triangles, including congruence and similarity.
Performance Indicators Assessed in Unit	4. B. Understand congruence in terms of rigid motions. 4. C. Prove geometric theorems. 4. E. Understand similarity in terms of similarity transformations. 4. F. Prove theorems involving similarity. 4. G. Define trigonometric ratios and solve problems involving right triangles.

Unit 4	Quadrilaterals and Circles
Summary	In this unit students focus on quadrilaterals, and circles. They learn the properties of the various quadrilaterals and continue to use coordinate proofs to prove theorems. Students learn the special properties of circles, including the form of their equations. They also learn about inscribed and circumscribed polygons, tangents, and secants.
Performance Indicators Assessed in Unit	4. C. Prove geometric theorems. 4. H. Understand and apply theorems about circles. 4. I. Find arc lengths and areas of sectors of circles. 4. J. Translate between the geometric description and the equation for a conic section. 4. K. Use coordinates to prove simple geometric theorems algebraically.
Unit 5	Area, Surface Area, and Volume
Summary	In this unit students learn to calculate measures in two and three dimensions: area, surface area, and volume. They find the areas of triangles and several types of quadrilaterals in addition to regular polygons, circles, and irregular figures. Students make models of three-dimensional figures and find surface area. Three dimensional figures are investigated further as students learn to find volume. They also identify congruent or similar solids and graph solids in space.
Performance Indicators Assessed in Unit	4. C. Prove geometric theorems. 4. D. Make geometric constructions. 4. L. Explain volume formulas and use them to solve problems. 4. M. Visualize relationships between two-dimensional and three-dimensional objects. 4. N. Apply geometric concepts in modeling situations.