

Honors Geometry

The following learning targets represent the major concepts studied and assessed in this course.

Semester 1

Unit A *Essentials of Geometry*

- A1** Construct precise definitions of geometric terms and use the term in written/verbal communication.
- A2** Use correct geometric notation and create/interpret diagrams with symbols to represent geometric definitions and relationships.
- A3** Use algebraic equations to represent geometric relationships.

Unit B *Parallel and Perpendicular Lines*

- B1** Determine and justify angle pair relationships using postulates and theorems.
- B2** Determine angle pair relationships using algebra.
- B3** Verify lines are parallel and perpendicular using geometric definitions, postulates, theorems, and/or constructions.
- B4** Verify lines are parallel and perpendicular on the coordinate plane.

Unit C *Transformations*

- C1** Perform, verify and/or write the rules for translations on figures within or without the coordinate plane, including composite transformations.
- C2** Perform, verify and/or write the rules for reflections on figures within or without the coordinate plane, including composite transformations.
- C3** Perform, verify and/or write the rules for rotations on figures within or without the coordinate plane, including composite transformations.
- C4** Perform, verify and/or write the rules for dilations on figures within or without the coordinate plane including composite transformations.

Unit D *Triangle Congruence*

- D1** Use CPCTC to solve for missing angle measures and side lengths.
- D2** Prove polygons congruent through rigid transformations.
- D3** Prove triangles congruent using theorems, rigid transformations and/or constructions.

Unit E *Relationships with Triangles*

- E1** Use triangle theorems to find interior and exterior angle measurements of triangles.

Semester 2

Unit F *Quadrilaterals and Polygons*

- F1** Identify polygons by their properties.
- F2** Find side lengths and exterior and interior angles of polygons. (**Honors**: includes cases that require factoring or systems of equations)
- F3** Identify a special polygon in a coordinate plane by using slope, distance formula, and/or midpoint formula.

Unit G *Similarity*

- G1** Use properties and relationships of similarity to justify figures that are similar.
- G2** Identify similarity triangle through dilations and the similarity postulates.
- G3** Use congruence and similarity of triangles to solve unknown measures. (**Honors**: includes triangle proportionality)
- G4** **Honors**: Write formal proofs involving the theorems of similar triangles(AA~, SAS~, SSS~).

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Unit H
Right Triangle
Trigonometry

- H1** Apply the Pythagorean Theorem and its converse (including simplifying and squaring radicals).
- H2** Identify and use special right triangle relationships (including dividing by radical 2 and 3).
- H3** Use trigonometric functions to determine side lengths and angle measurements.
- H4 Honors:** Understand and use the Law of Sines to solve problems.
- H5 Honors:** Derive and use the formula $A = \frac{1}{2}ab\sin C$ for the area of a triangle.

Unit I
Surface Area and
Volume

- I1** Use a variety of models to represent 3-D figures (nets, orthogonal drawings, cross-section, figures formed by transforming 2-D objects).
- I2** Calculate the surface area of a 3-D shape using a variety of models.
- I3** Calculate the volume of a 3-D shapes using a variety of models.

Unit J
Properties of Circles

- J1** Find the measures of central angles, inscribed angles, and arc measures.
- J2** Find the area of a sector and the length of an arc.
- J3** Develop and write equations of circles.
- J4 Honors:** Draw and apply inscribed/circumscribed circles to solve problems.