

## Grade 9-12 Unpacked Core Math Standards – Geometry

**9-12.G.1.1.** Students are able to **apply** the properties of triangles and quadrilaterals to **find unknown parts**.

Webb Level: 2

**Bloom: Application**

Verbs Defined:

**Apply:** use, apply

**Find:** identify the value

**Key terms defined:**

Properties: The definitions, axioms, postulates, theorems, and corollaries unique to a triangle and/or a quadrilateral.

Unknown parts: Missing lengths of sides and/or missing measures of angles.

**Teacher Speak:**

Students are able to apply (use) the properties of triangles and quadrilaterals to find (identify the value of) unknown parts.

**Student Speak:**

- I can identify the value of (find) the length and midpoint of any (horizontal, vertical or oblique) segment on the coordinate plane.
- I can identify the value of (find) the slope of any line in the coordinate plane.
- Given two lines in the coordinate plane, I can determine if the lines are parallel, perpendicular or neither.
- Given a complex diagram, I can solve for the missing lengths of a segment or missing measures of angles.
- I can identify special angle pairs (vertical, complementary, supplementary, linear pair and adjacent.)
- I can solve problems using special angle pairs (vertical, complementary, supplementary, linear pair and adjacent.)
- I can identify the relationships between two lines: parallel, intersecting and skew.
- I can identify the special angle pairs formed when two parallel lines are cut by a transversal: corresponding, alternate interior, same-side interior.
- Given the measure of one angle when two parallel lines are cut by a transversal, I can calculate the measures of all of the other angles.
- I can use the symbols for perpendicular and parallel ( $\perp$  and  $\parallel$ ).
- I can use medians, angle bisectors and altitudes in a triangle to solve problems.
- I can classify special quadrilaterals based on their angle measures, side characteristics, and diagonal characteristics. (quadrilateral, rectangle, rhombus, square, parallelogram, trapezoid, and isosceles trapezoid.)

- Given a special quadrilateral, I can identify the value of (find) its missing parts.
  - I can identify the value of (find) the missing side of any right triangle in decimal form.
  - Given the length of one side of a  $45^\circ$ - $45^\circ$ - $90^\circ$  or a  $30^\circ$ - $60^\circ$ - $90^\circ$  triangle, I can calculate the length of the other two sides.
  - Given the measures of 3 line segments, I can determine if the line segments will form a triangle.
  - Given the lengths of the three sides of a triangle, I can determine if the triangle is a right triangle.
  - I can classify triangles by both the number of congruent sides and the measures of the angles.
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**9-12.G.2.1.** Students are able to **recognize** the relationship between a three-dimensional figure and its two-dimensional representation.

**Webb Level: 2**

**Bloom: Analysis**

**Verbs Defined:**

**Recognize:** Identify

**Key terms defined:**

Relationship: The spatial correlation.

Three dimensional figure: A shape that is solid. It has a length, width and height.

Two-dimensional representation: A pattern that can be folded to form a three-dimensional figure, the net.

**Teacher Speak:**

Students are able to **recognize** (identify) the relationship between a three-dimensional figure and its two-dimensional representation.

**Student Speak:**

- Given the two dimensional representation (A pattern that can be folded to form a three-dimensional figure, the net) of a 3-dimensional shape (A shape that is solid. It has a length, width and height), I can identify the solid (polyhedron).
  - Given a 3-dimensional shape (solid), I can draw its net (A pattern that can be folded to form a three-dimensional figure).
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**9-12.G.2.2.** Students are able to **reflect** across vertical or horizontal lines, and **translate** two-dimensional figures.

**Webb Level: 2/3**

**Bloom: Application**

**Verbs Defined:**

**Reflect:** Flip (Create a mirror image)

**Translate:** Slide

**Key terms defined:**

Vertical line: Any line that is at right angles to the horizon. Any line that is perpendicular to the x-axis in the coordinate plane.

Horizontal line: Any line that is parallel to the horizon. Any line that is parallel to the x-axis in the coordinate plane.

Two-dimensional figure: A plane figure. It has a length and width.

**Teacher Speak:**

Students are able to reflect (flip) across vertical or horizontal lines, and translate (slide) two-dimensional figures.

**Student Speak:**

- I can flip (reflect) figures over a vertical line (Any line that is at right angles to the horizon. Any line that is perpendicular to the x-axis in the coordinate plane) or a horizontal line (Any line that is parallel to the horizon. Any line that is parallel to the x-axis in the coordinate plane.)
- I can draw the line(s) of symmetry on a plane figure.
- I can slide (translate) figures and identify the components.
- Given the coordinates of the pre-image, I can state the coordinates of the image after a:
  - reflection over a vertical line (Any line that is at right angles to the horizon. Any line that is perpendicular to the x-axis in the coordinate plane) or a horizontal line (Any line that is parallel to the horizon. Any line that is parallel to the x-axis in the coordinate plane.)
  - Slide (translation).
  - Composite transformation of flips (reflections) and slides (translations).

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**9-12.G.2.3.** Students are able to **use proportions** to **solve** problems.

**Webb Level: 2**

**Bloom: Application**

**Verbs Defined:**

**Use:** Apply

**Solve:** solve

**Key terms defined:**

Proportion: An equation that states that two ratios are equivalent.

**Teacher Speak:**

Students are able to use (apply) proportions to solve problems. This is more than finding the missing side of two similar triangles or quadrilaterals.

**Student Speak:**

- I can write and solve a proportion (An equation that states that two ratios are equivalent.)
- I can apply (use) a proportion (An equation that states that two ratios are equivalent) to solve application problems.
- I can find the missing length of a side and/or perimeter of similar polygons.

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