



Geometry Essential Skills

What will my child learn in WCPS Geometry?

Unit 1

- ☐ Identify and define a point, line, plane, segment, ray, angle, adjacent, midpoint, congruent, vertex, acute angle, obtuse angle, right angle, complementary angles, supplementary angles, vertical angles, linear pair, perimeter, area, radius, diameter, and circumference
- ☐ Correctly notate a point, line, angle, segment, line, and ray
- ☐ Understand the connection between a segment and a number line and that a segment represents a distance of two values, one at the starting point and one at the end point
- ☐ Use segment addition and subtraction to solve equations when expressions represent a length
- ☐ Understand that a midpoint divides a line segment into two congruent lengths and solve for missing lengths when represented by expressions

- ☐ Understand that when two angles share the same ray, the adjacent angles make a new, larger angle and an angle bisector divides the angles into two congruent smaller angles.. Be able to solve for missing angles when the degrees are represented by expressions.
- ☐ Understand that a straight angle is 180 degrees (supplementary) and how to identify a linear pair; complementary angles add up to 90 degrees; and vertical angles are congruent. Be able to solve for missing angles when the degrees are represented by expressions.
- ☐ Use the distance and midpoint formulas to calculate the distance and midpoint of two points. Simplify the distance in simplified radical form if necessary.
- ☐ Understand that perimeter/circumference is the distance around an object/circle. Calculate missing lengths if expressions represent the sides/radius or diameter of a shape/circle when given the perimeter/circumference of that shape/circle.
- ☐ Use area formulas to calculate the area of quadrilaterals, triangles, trapezoids and circles.

*Calculate an endpoint given one endpoint and the midpoint.

Unit 2

Geometry Essential Skills

☐ Given two lines cut by a transversal, identify alternate interior angles, alternate exterior angles, linear pairs, same side interior angles, and corresponding angles. If given expressions for the angles, set up and solve for missing degrees. ☐ If two parallel lines are cut by a transversal, identify which angle pair is congruent or supplementary. If given expressions for the angles, set up and solve for missing degrees.	☐ Graph a line in the coordinate plane if given the slope and y-intercept, the slope and a point it passes through, or two points it passes through ☐ Determine the line parallel or perpendicular to a given line if the given the slope and y-intercept, the slope and a point it passes through, or two points it passes through.
Unit 3	
☐ Solve for missing angles in triangles when given expressions for the angles. ☐ Use the remote interior angles theorem to solve for an exterior angle of a triangle. ☐ Identify acute, obtuse, right, isosceles and equilateral triangles given the angle measurements. ☐ Identify angle-side relationships in triangles. ☐ Find missing side lengths for right triangles using the Pythagorean Theorem. ☐ Identify acute, obtuse and right triangles given the side lengths. ☐ Identify polygons by their name and determine if two polygons are congruent given their angles and side lengths. ☐ After determining if two shapes are congruent, correctly write a congruence statement. ☐ Examine two triangles and apply SSS, SAS, ASA, AAS or HL to determine if two triangles are congruent	☐ Solve for missing angles and sides in congruent figures. If variable expressions represent the sides and angles, be able to set up the equations to solve for the missing value. ☐ Know that if a triangle is isosceles, it has two congruent sides and two congruent base angles. If a triangle is equilateral, all sides and all angles are congruent (60°). If variable expressions represent the sides and angles, be able to set up the equations to solve for the missing value. ☐ Using previous knowledge of the Pythagorean Theorem, understand how HL Theorem works for right triangles. If variable expressions represent the legs or hypotenuses, be able to set up equations and solve the missing value. * Solve for the range of possible lengths for the third side of a triangle. * Prove that corresponding parts to congruent triangles are congruent.



Geometry Essential Skills

	*Write a two column proof for proving triangles congruent.
Unit 4	
☐ Via exploration, understand how the polygon angle sum theorem is derived and use it to determine the sum of angles for any given polygon, one angle measure for a regular polygon, and how many sides a polygon has if given its sum. If the angles are represented by variable expressions, be able to set up and solve for the missing values. ☐ Knowing that the exterior angle sum is 360°, find missing values when the exterior angles are represented with variable expressions.	☐ Identify and prove parallelograms, specifically squares, rhombi, and rectangles. Use their properties to solve for missing side lengths, diagonal lengths, and angles. ☐ Calculate area and perimeter of parallelograms and triangles in the coordinate plane. *Use properties of trapezoids and kites to solve for missing lengths and angles.
Unit 5	
☐ Solve proportions using cross multiplication. ☐ Set up ratios of corresponding sides in similar figures and solve proportions to solve for missing side lengths for those similar figures. ☐ Use AA, SAS, and SSS to prove similar triangles and write a similarity statement.	☐ Set up and solve proportions for the area and perimeter of a similar figures. *Use properties of triangle proportions to solve for similar triangles.
Unit 6	
☐ Set up and solve for missing side lengths in right triangles using the Pythagorean Theorem. ☐ Perform operations on radicals including rationalizing the denominator. ☐ Use the rules for the side lengths in special right triangles to solve for missing lengths, rationalizing when	☐ Set up trigonometric ratios to solve for missing sides and angles. ☐ Use the formulas for Law of Sines/Cosines to solve for missing lengths or angles in non-right triangles given a picture, parts of a triangle, or word problem. *Apply special right triangles to solve for missing angles and lengths of other polygons.



Geometry Essential Skills

needed.	*Apply right triangle trigonometry to solve for missing angles and lengths of other polygons.
Unit 7	
☐ Calculate the area of parallelograms, triangles, circles, trapezoids, and regular polygons. ☐ Given the area, use the formula to solve for the missing value. ☐ Calculate the sector area of a circle	*Apply special right triangles and right triangle trigonometry to solve for missing lengths in polygons to calculate the polygon's area and perimeter.
Unit 8	
☐ Identify the base of a solid and calculate its area ☐ Correctly name 3D figures. ☐ Derive surface area and volume formulas from connections made about area and perimeter of 2D figures	☐ Use the formulas to calculate the surface area and volume for any prism, pyramid, cylinder, cone, and sphere *Apply special right triangles and right triangle trigonometry to solve for missing lengths in solids to calculate the surface area and volume.

*Additional Advanced Geometry topics in conjunction with increased rigor of general curriculum.