

## Geometry B Year-at-a-Glance 2018-2019

Year-at-a-Glance			
FIRST SEMESTER		SECOND SEMESTER	
Unit 1 Review, Polygons, Measurement and Dimension	Unit 2 Right Triangles and Transformations	Unit 3 Congruence and Polygons	Unit 4 Similarity
1st 9-weeks	2nd 9-weeks	3rd 9-weeks	4th 9- weeks
<p><b>Foundations</b></p> <ul style="list-style-type: none"> <li>● Vocabulary</li> </ul> <p><b>Review of 2D</b></p> <ul style="list-style-type: none"> <li>● Perimeter and area</li> <li>● TI-84 calculator review</li> </ul> <p><b>Polygons</b></p> <ul style="list-style-type: none"> <li>● Prop. of Quadrilaterals</li> </ul> <p><b>Measurement &amp; Dimension</b></p> <ul style="list-style-type: none"> <li>● Volume and effects of changing dimensions - cylinders, pyramids, cones, and prisms</li> <li>● Modify formulas for composite figures</li> <li>● Cross-sections of 3D objects</li> <li>● 3D objects created by rotations of 2D</li> <li>● Area and volume in modeling situations</li> </ul>	<p><b>Transformations</b></p> <ul style="list-style-type: none"> <li>● Rigid motion/congruence</li> <li>● Translations</li> <li>● Rotations</li> <li>● Reflections</li> </ul> <p><b>Right Triangles</b></p> <ul style="list-style-type: none"> <li>● Trigonometry</li> <li>● Special Right Triangles</li> <li>● Pythagorean Theorem</li> </ul>	<p><b>Congruence</b></p> <ul style="list-style-type: none"> <li>● Congruence</li> <li>● Triangle Congruence Theorems</li> </ul> <p><b>Polygons</b></p> <ul style="list-style-type: none"> <li>● Coordinate proofs</li> <li>● Coordinate perimeter/area computation</li> </ul>	<p><b>Similarity</b></p> <ul style="list-style-type: none"> <li>● Scale Factor</li> <li>● Dilations - including circles</li> <li>● Ratios and Proportions</li> <li>● Similar Triangle</li> <li>● Similarity Theorems</li> </ul>

**BLUE** - Power Standard

**BLACK** - Additional Skills

**RED** - Closing the Achievement Gap

**Green** - Familiarity Only

[Unit 1](#)

[Unit 2](#)

[Unit 3](#)

[Unit 4](#)

[Unit 5](#)

<b>Unit 1</b>	Review of Geometry, Polygons, Measurements and Dimensions	<b>Grade Level</b>	Geometry B	<b>Approx Length</b>	9 weeks
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### CPSD Power Standards with Student Learning Objectives

**HSG.CO.C.11** Apply and prove theorems about quadrilaterals Note: Theorems include but are not limited to relationships among the sides, angles, and diagonals of quadrilaterals and the following theorems concerning parallelograms: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. Note: Proofs are not an isolated topic and therefore should be integrated throughout the course.

#### Student-Friendly Objectives:

- I can classify quadrilaterals using deductive reasoning (proof using geometric strategies).
- I can calculate segment lengths or angle measures of quadrilaterals.
- I can use the properties of parallelograms, rectangles, rhombi, squares and trapezoids to model geometric situations and solve problems using algebraic properties.
- I can justify that a quadrilateral is/is not a parallelogram by citing evidence.

**HSG.GMD.A.3** Use volume formulas for cylinders, pyramids, cones, ~~spheres~~, and to solve problems which may involve composite figures • Compute the effect on volume of changing one or more dimension(s) For example: How is the volume affected by doubling, tripling, or halving a dimension?

#### Student-Friendly Objectives:

- I can determine the correct volume formula to use based on the shape(s).
- I can calculate the volume of solids with correct formulas.
- I can modify formulas for composite figures.
- I can compare the effect on the volume when a dimension is changed.
- I can use geometric concepts (such as Pythagorean Theorem, special right triangles, etc.) to determine volume of composite figures.
- I can model and solve geometric problems using reasoning and/or algebraic properties.

### Learning Indicators of Power Standards

Students will know...

- Vocabulary that relates to 3-D shapes including the dimensions of each formula
- The effects on the volume of a shape by changing a

And be able to...

- Identify which measurements should be used in a volume formula.
- Calculate the volume of a solid given its dimensions.
- Compare the volumes of different composite figures.

dimension(doubling, tripling, or halving)

- Composite shapes can be decomposed into cylinders, pyramids, cones, and prisms.
- The five characteristics of parallelograms: opposite sides are congruent and parallel; opposite angles are congruent; consecutive angles are supplementary; diagonals bisect each other.
- The characteristics of a rectangle include those of a parallelogram AND 4 right angles; diagonals are congruent
- The characteristics of a rhombus include those of a parallelogram AND diagonals are perpendicular; 4 congruent sides
- The characteristics of a square include ALL properties of a parallelogram, rectangle and rhombus
- Base angles of an isosceles trapezoid are congruent
- Legs of an isosceles trapezoid are congruent
- Trapezoids have at least one pair of parallel sides

- Find a dimension given the volume of a figure.
- Determine what geometric figures are used to create a composite figure and then use the appropriate formulas to calculate volume of the composite.
- Classify a quadrilateral as a parallelogram, rectangle, rhombus, square, trapezoid, isosceles trapezoid, or none of these.
- Prove theorems about quadrilaterals using distance formula, midpoint formula, and slope.
- Model geometric situations and solve problems using algebraic properties.
- Apply the properties of parallelograms, rectangles, rhombi, squares and trapezoids to solve for missing values.

**Additional Arkansas State Standards**

None

<b>Unit 2</b>	Right Triangles and Transformations	<b>Grade Level</b>	Geometry B	<b>Approx Length</b>	9 weeks
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### CPSD Power Standards with Student Learning Objectives

**HSG.SRT.C.8** Use trigonometric ratios, special right triangles, and the Pythagorean Theorem to find unknown measurements of right triangles in applied problems Note: Examples should Including, but are not limited to angles of elevation, angles of depression, navigation, and surveying.

#### Student Friendly Objectives:

- I can employ the Pythagorean Theorem to solve real world problems.
- I can apply 30-60-90 right triangle ratios or 45-45-90 right triangle ratios to solve for missing sides in a right triangle.
- I can identify sides of a right triangle (given an angle) as opposite, adjacent, or hypotenuse.
- I can write sine, cosine, and tangent ratios for an angle in a right triangle.
- I can determine when to use a trig ratio or the trig inverse.
- I can solve for a missing value in a trig ratio problem.
- I can use technology appropriately to solve problems involving trig ratios

### Learning Indicators of Power Standards

#### Students will know...

- Congruence is associated with rigid transformations (rotations, reflections, translations)
- Rigid transformations are isometries
- Similarity is associated with dilations, which are not rigid transformations
- The Pythagorean Theorem
- 30-60-90 right triangles have constant ratios of  $1, 2, \sqrt{3}$
- 45-45-90 right triangles have constant ratios of  $1, 1, \sqrt{2}$
- The sine of an angle represents the ratio of the measures of the opposite side to the hypotenuse
- The cosine of an angle represents the ratio of the measures of the adjacent side to the hypotenuse
- The tangent of an angle represents the ratio of the measures of the opposite side to the adjacent side

#### And be able to...

- Identify parts of a right triangle (hypotenuse, adjacent side, opposite side) in reference to a given acute angle.
- Use technology appropriately with respect to trigonometry.
- Write each trig ratio for a given angle measure.
- Solve for a missing value in a trig ratio problem including how and when to use the trig inverse.
- Find the missing measures of right triangles.
- Solve real-world problems involving right triangles using trigonometric ratios and the Pythagorean Theorem or properties of similar figures.

**Additional Arkansas State Standards**

None

<b>Unit 3</b>	Congruence and Polygons	<b>Grade Level</b>	Geometry B	<b>Approx Length</b>	9 weeks
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**CPSD Power Standards with Student Learning Objectives**

**HSG.SRT.B.5 7** Use congruence (SSS, SAS, ASA, AAS, and HL) and similarity (AA~, SSS~, SAS~) criteria for triangles to solve problems • Use congruence and similarity criteria to prove relationships in geometric figures

**Student Friendly Objectives:**

- I can prove two triangles are congruent using one of five methods: SSS, SAS, ASA, AAS, or HL.
- I can explain why the five methods for triangle congruence are shortcuts.
- I can explain how CPCTC allows us to solve for other parts of congruent triangles.

**HSG.CO.C.11** Apply and prove theorems about quadrilaterals Note: Theorems include but are not limited to relationships among the sides, angles, and diagonals of quadrilaterals and the following theorems concerning parallelograms: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals. Note: Proofs are not an isolated topic and therefore should be integrated throughout the course.

**Student-Friendly Objectives:**

- I can classify quadrilaterals using deductive reasoning (proof using geometric strategies).
- I can calculate segment lengths or angle measures of quadrilaterals.
- I can use the properties of parallelograms, rectangles, rhombi, squares and trapezoids to model geometric situations and solve problems using algebraic properties.

**Learning Indicators of Power Standards**

Students will know...

- There are 5 methods used to prove triangles are congruent (SSS, SAS, ASA, AAS, HL)
- Corresponding parts of congruent triangles are congruent (CPCTC)
- The five characteristics of parallelograms: opposite sides are congruent and parallel; opposite angles are congruent; consecutive angles are supplementary; diagonals bisect each other.

And be able to...

- Prove congruence of triangles.
- Employ CPCTC to solve problems.
- Model geometric situations and solve problems using algebraic properties.
- Solve real-world problems and prove relationships using congruence theorems of triangles.

- The characteristics of a rectangle include those of a parallelogram AND 4 right angles; diagonals are congruent
- The characteristics of a rhombus include those of a parallelogram AND diagonals are perpendicular; 4 congruent sides
- The characteristics of a square include ALL properties of a parallelogram, rectangle and rhombus
- Base angles of an isosceles trapezoid are congruent
- Legs of an isosceles trapezoid are congruent
- Trapezoids have at least one pair of parallel sides

- Classify a quadrilateral as a parallelogram, rectangle, rhombus, square, trapezoid, isosceles trapezoid, or none of these.
- Prove theorems about quadrilaterals using distance formula, midpoint formula, and slope.
- Model geometric situations and solve problems using algebraic properties.
- Apply the properties of parallelograms, rectangles, rhombi, squares and trapezoids to solve for missing values.

**Additional Arkansas State Standards**

None



<b>Unit 4</b>	Similarity	<b>Grade Level</b>	Geometry B	<b>Approx Length</b>	9 weeks
<b>CPSPD Power Standards with Student Learning Objectives</b>					
<p><b>HSG.SRT.B.5</b> Use congruence (SSS, SAS, ASA, AAS, and HL) and similarity (AA~, SSS~, SAS~) criteria for triangles to solve problems • Use congruence and similarity criteria to prove relationships in geometric figures</p> <p><b>Student Friendly Objectives:</b></p> <ul style="list-style-type: none"> <li>• I can use ratios and proportions to solve problems involving similar figures.</li> <li>• I can use similarity and congruence theorems for triangles to solve real-world problems.</li> </ul>					
<b>Learning Indicators of Power Standards</b>					
<p>Students will know...</p> <ul style="list-style-type: none"> <li>• There are 3 methods used to prove triangles are similar (SSS~, SAS~, AA~)</li> <li>• Similarity is associated with dilations, which are not rigid transformations</li> </ul>			<p>And be able to...</p> <ul style="list-style-type: none"> <li>• Model geometric situations and solve problems using algebraic properties.</li> <li>• Solve real-world problems and prove relationships using similarity and congruence theorems of triangles.</li> <li>• Apply ratios and proportions to solve problems using the properties of similar figures (indirect measurement).</li> </ul>		
<b>Additional Arkansas State Standards</b>					
None					