Mathematics
Geometry CP
Unit 10: Right Triangles

Essential Understandings	▪ Right triangles have many real-world applications.
Essential Questions	▪ What is a right triangle? ▪ What is the Pythagorean Theorem? ▪ What are the special right triangles? ▪ What are the properties of right triangles? ▪ What are the properties of the special right triangles? ▪ What are the three trigonometric ratios? ▪ How can the three trigonometric ratios and the Pythagorean Theorem be applied in real-life situations?
Essential Knowledge	▪ The Pythagorean Theorem is used to solve problems with right triangles. ▪ Special right triangles can be broken into 30/60/90 or 45/45/90 triangles. ▪ Trigonometric ratios can be used to solve right triangle problems.
Vocabulary	▪ Terms: 　▪ leg, hypotenuse, geometric mean, Pythagorean triples, opposite leg, adjacent leg, sine ratio, cosine ratio, tangent ratio, angle of elevation, angle of depression, the Pythagorean Theorem, the 45-45-90 theorem, the 30-60-90 theorem
Essential Skills	▪ Use the Pythagorean Theorem to solve right triangle problems. ▪ Use the 30-60-90 theorem to solve problems involving those angles. ▪ Use the 45-45-90 theorem to solve problems involving those angles. ▪ Use the three trigonometric ratios to solve right triangle problems. ▪ Apply all of the above to solve problems involving other figures such as quadrilaterals, pentagons, hexagons, octagons, etc.

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Related Maine Learning Results	<u>Mathematics</u>
	C. Geometry
	  Geometric Figures
	  C1.Students justify statements about polygons and solve problems.
	    a. Use the properties of triangles to prove theorems about figures and relationships among figures.
	    b. Solve for missing dimensions based on congruence and similarity.
	    c. Use the Pythagorean Theorem in situations where right triangles are created by adding segments to figures.
	    d. Use the distance formula.
	  C2.Students justify statements about circles and solve problems.
	    a. Use the concepts of central and inscribed angles to solve problems and justify statements.
	    b. Use relationships among arc length and circumference, and areas of circles and sectors to solve problems and justify statements.
	  C3.Students understand and use basic ideas of trigonometry.
	    a. Identify and find the value of trigonometric ratios for angles in right triangles.
	    b. Use trigonometry to solve for missing lengths in right triangles.
	    c. Use inverse trigonometric functions to find missing angles in right triangles.
	  Geometric Measurement
	  C4.Students find the surface area of three-dimensional figures.
	    a. Find the volume and surface area of three-dimensional figures including cones and spheres.
	    b. Determine the effect of changes in linear dimensions on the volume and surface area of similar and other three-dimensional figures.

Sample Lessons And Activities	▪ Students work on worksheets that require them to analyze the right triangle problems as Pythagorean Theorem, specials or trigonometry problems.
Sample Classroom Assessment Methods	▪ The students can model their solutions to these problems on the overhead or board for comprehensions and accuracy.

Sample Resources	▪ <u>Publications:</u>
	  ▪ <u>Geometry</u> - McDougal Littell
	  o <u>Geometry: Concepts and Skills</u> - McDougal Littell