Mathematics
Geometry CP
Unit 3: Parallel and Perpendicular Lines

Essential Understandings	▪ Parallel lines and a transversal form pairs of angles that are congruent or supplementary. ▪ Congruent angles can determine parallel lines. ▪ The sum of the measures of the interior angles of a triangle is 180. ▪ Skew lines are non coplanar. ▪ The sum of the interior angles of a polygon is related to the number of sides. ▪ The sum of the exterior angles of a polygon, one at each vertex, is always equal to 360. ▪ Inductive reasoning involves using patterns, not deductions. ▪ A regular polygon has congruent angles and congruent sides.
Essential Questions	▪ What are some relationships between angles formed by parallel lines and a transversal? ▪ What is the difference between deductive and inductive reasoning? ▪ What determines parallel lines? ▪ What are the names of the special pairs of angles formed by a transversal? ▪ What theorems involve parallel lines?
Essential Knowledge	▪ Complementary Angles add up to 90 degrees ▪ Supplementary pairs of angles add up to 180 degrees. ▪ Vertical pairs of angles are congruent. ▪ Right angles add up to 90 degrees. ▪ Perpendicular lines intersect at 90 degrees. ▪ A conditional statement can be put in the form “if A then B.” ▪ A converse statement can be put in the form “if B then A”. ▪ A two-column proof follows a specific format. ▪ Reasoning skills are used when solving proofs. ▪ Known angles can be used to reach conclusions about other angles.
Vocabulary	▪ <u>Terms</u>: ○ vertical angles, complementary angles, supplementary angles, perpendicular lines, conditional statement, biconditional statement, converse, hypothesis, conclusion, counterexample, and deductive reasoning
Essential Skills	▪ Write a formal two-column proof. ▪ Find the measure of an angle from other known angle measures. ▪ Deduce which pairs of angles are congruent, vertical, complementary, or supplementary. ▪ Deduce which pairs of lines are perpendicular. ▪ Use definitions and theorems in writing a proof. ▪ Determine the truth value of a conditional statement and its converse. ▪ Determine the truth value of a biconditional statement. ▪ Find a counterexample for a false conditional.

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Related Maine Learning Results	Mathematics 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	▪ Have students draw three triangles and measure the interior angles of each triangle. Students will make an observation regarding the interior angles.
Sample Classroom Assessment Methods	▪ In class work on the overhead and board to model work ▪ Group work with other students which is evaluated by peers ▪ Quizzes ▪ Tests ▪ Take-home worksheets and tests
Sample Resources	▪ Publications: ○ Geometry - McDougal Littell

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