Mathematics **Brunswick School Department**

Topics in Algebra and Geometry
Unit 8: Quadrilaterals

Essential Understandings	▪ There are many professions that utilize polygons in their occupations. ▪ Geometry provides a systematic approach for classifying polygons.
Essential Questions	▪ How are polygons identified and classified? ▪ What is a quadrilateral? ▪ How are the angles of a quadrilateral determined? ▪ How are the properties of parallelograms applied? ▪ What criteria are necessary for a quadrilateral to be classified as a parallelogram? ▪ What are the special types of quadrilaterals? ▪ What are the properties associated with each of the special types of parallelograms? ▪ What are the properties of trapezoids? ▪ What are the properties of the midsegment of a trapezoid>
Essential Knowledge	▪ A polygon is a plane figure that is formed by three or more segments called sides. ▪ A segment that joins two nonconsecutive vertices of a polygon is called a diagonal. ▪ Polygons are classified by the number of sides they have. ▪ If a quadrilateral is a parallelogram, then its opposite angles are congruent. ▪ If a quadrilateral is a parallelogram, then its opposite sides are congruent. ▪ If a quadrilateral is a parallelogram, then its consecutive angles are supplementary. ▪ If a quadrilateral is a parallelogram, then its diagonals bisect each other. ▪ A rhombus is a parallelogram with four congruent sides. ▪ A rectangle is a parallelogram with four right angles. ▪ A square is a parallelogram with four congruent sides and four congruent right angles. ▪ The diagonals of a rhombus are perpendicular. ▪ The diagonals of a rectangle are congruent. ▪ A trapezoid is a quadrilateral with exactly one pair of parallel sides. ▪ If a trapezoid is isosceles, then each pair of base angles are congruent. ▪ The midsegment of a trapezoid is the segment that connects the midpoints of its legs.
Vocabulary	▪ Terms: ▪ parallelogram, rectangle, rhombus, square, trapezoid and isosceles trapezoid; opposite sides, opposite angles, diagonals, bisect, bases, legs, base angles, and midsegment of trapezoids

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Essential Skills	▪ Find angle measurements of quadrilaterals. ▪ Identify special quadrilaterals. ▪ Use the properties of parallelograms, rhombuses, rectangles, squares, and trapezoids to find their side lengths and angle measures. ▪ Investigate the midsegment of a trapezoid.
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. 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.
Sample Lessons And Activities	▪ Students will utilize the A++ Learning program in our computer lab to explore quadrilaterals.
Sample Classroom Assessment Methods	▪ Students will take the computer assessments aligned with the A++ Learning program on quadrilaterals.
Sample Resources	▪ Publications: o Geometry, Jurgensen, Brown, Jurgensen (McDougal Littell) o Geometry: Concepts and Skills, Larson, Boswell, Stiff (McDougal Littell)