Mathematics **Brunswick School Department**

Honors Geometry
Unit 5: Similar Polygons

Essential Understandings	▪ Similar polygons have many real-world applications.
Essential Questions	▪ What is a ratio? ▪ What is a proportion? ▪ What are similar polygons? ▪ What are the properties of similar polygons? ▪ What are similar triangles? ▪ How can you show that triangles are similar? ▪ How can the properties of similar polygons be applied in real-life situations?
Essential Knowledge	▪ Similar polygons have: o Corresponding angles that are congruent. o Corresponding sides that are in proportion. ▪ Certain lengths in triangles are in proportion.
Vocabulary	▪ <u>Terms</u>: o ratio, proportion, means, extremes, similar polygons, similar triangles, scale factor, divided proportionally, proportional lengths, midsegment, reduction, enlargement, dilation, AA postulate, SAS Similarity theorem, SSS Similarity theorem, Triangle Proportionality theorem, Parallel Lines Proportionality theorem, Triangle Angle Bisector theorem
Essential Skills	▪ Solve proportions using algebraic properties. ▪ Identify similar polygons and similar triangles. ▪ Apply the definition of similar to find the measures of angles and lengths of sides of similar polygons. ▪ Prove triangles are similar using AA, SAS, and SSS similarity. ▪ Solve algebraic equations using properties of properties of proportions.

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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.

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Related Maine Learning Results	D. Algebra Equations and Inequalities D2. Students solve families of equations and inequalities. a. Solve systems of linear equations and inequalities in two unknowns and interpret their graphs. b. Solve quadratic equations graphically, by factoring in cases where factoring is efficient, and by applying the quadratic formula. c. Solve simple rational equations. d. Solve absolute value equations and inequalities and interpret the results. e. Apply the understanding that the solution(s) to equations of the form f(x) = g(x) are x-value(s) of the point(s) of intersection of the graphs of f(x) and g(x) and common outputs in table of values. f. Explain why the coordinates of the point of intersection of the lines represented by a system of equations is its solution and apply this understanding to solving problems. D3. Students understand and apply ideas of logarithms. a. Use and interpret logarithmic scales. b. Solve equations in the form of $x + b^{y}$ using the equivalent form $y = \log_b x$.
Sample Lessons And Activities	▪ Use the AA Similarity Postulate to identify and prove triangles are similar ▪ Use the scale factor of similar triangles to find the measures of missing lengths
Sample Classroom Assessment Methods	▪ Quizzes ▪ Take-home worksheets ▪ Tests
Sample Resources	▪ Publications: o Geometry, McDougal Littell