Mathematics **Brunswick School Department**

Geometry: Academic
Unit 9: Circles

Essential Understandings	▪ Circles have unique properties and applications which are different from those of other geometric figures. ▪
Essential Questions	▪ What is a circle? ▪ How do circles relate to other geometric shapes? ▪ What are the parts of a circle? ▪ What are the properties of the parts of a circle? ▪ How can the properties of circles be applied in real-life situations?
Essential Knowledge	▪ Circles have many properties and applications.
Vocabulary	Terms: o circle, semicircle, radius, diameter, chord, secant, tangent lines, tangent circles, point of tangency, major arc, minor arc, arc length, concentric circles, central angle, inscribed angle, circumscribed angle, intercepted arc, inscribed polygons, circumscribed polygons, rotation, rotational symmetry
Essential Skills	▪ Identify the parts of a circle. ▪ Apply the properties of the parts of a circle to solve problems. ▪ Find the degree measures of arcs and angles in a circle. ▪ Find the lengths of segments associated with a circle. ▪ Find the lengths of arcs of a circle.
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.

Related Maine Learning Results	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 and volume of three-dimensional objects. 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 areas of similar and other three-dimensional figures. D. Algebra Symbols and Expressions D1. Students understand and use polynomials and expressions with rational exponents. a. Simplify expressions including those with rational numbers. b. Add, subtract, and multiply polynomials. c. Factor the common term out of polynomial expressions. d. Divide polynomials by (ax+b). 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 $y = \log_b x$.

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Sample Lessons And Activities	▪ Introduce basic terms relating to circles: center, radius, chord, secant, diameter, tangent, point of tangency ▪ Identify and name these basic parts of circles
Sample Classroom Assessment Methods	▪ Quizzes ▪ Take-home worksheets ▪ Tests
Sample Resources	▪ Publications: o Geometry, Jurgensen, Brown, Jurgensen (McDougal Littell) o Geometry: Concepts and Skills, Larson, Boswell, Stiff (McDougal Littell)