Mathematics

Brunswick School Department Geometry: Academic Unit 10: Areas of Plane Figures

Essential Understandings	 Area has many real-life applications.
Essential Questions	 What is area? What is perimeter? What is circumference? How do we find areas of geometric figures? How can we use area to answer other real-life situations?
Essential Knowledge	 The area and perimeter of polygons and circles can be used to solve many real-life applications.
Vocabulary	<u>Terms</u> : • area, perimeter, altitude, base, height; center, apothem, radius, and central angle of a regular polygon; circumference, Pi (π), segment (of a circle), sector (of a circle); probability and geometric probability
Essential Skills	 Find the area and perimeter of triangles, parallelograms, rectangles, rhombuses, squares and trapezoids. Find the area and perimeter of regular polygons. Apply the Pythagorean Theorem and right triangle trigonometry to find the areas and perimeters of polygons and circles. Find the area and circumference circles. Find the area of a segment and a sector of a circle. Find the lengths of arcs of a circle. Find geometric probability. Find ratios to find the areas and perimeter of regions enclosed by combining (parts of) circles and polygons.

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	C. Geometry
	Geometric Figures
	C1. Students justify statements about polygons and solve problems.
	 Use the properties of triangles to prove theorems about
	figures and relationships among figures.
	 b. Solve for missing dimensions based on congruence and
	similarity.
	 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.
Related	b. Use relationships among arc length and circumterence, and
Maine Learning	areas of circles and sectors to solve problems and justify
Results	Statements.
	C3. Students understand and use basic ideas of ingonometry.
	a. Identity and this the value of the phonometric 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.

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	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 Eactor the common term out of polynomial expressions
	 d Divide polynomials by (ax+b)
	Guations and Inequalities
	Equations and mequalities D2 Students solve families of equations and inequalities
	D2. Students solve families of equations and inequalities.
	a. Solve systems of inteal equations and intequalities in two unknowns and interpret their graphs
	b. Solvo quadratic equations graphically by factoring in cases
	where factoring is efficient, and by applying the quadratic
Related	formula.
Maine Learning	c. Solve simple rational equations.
Results	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
	y
	b. Solve equations in the form of $x + b$ using the equivalent
	form $y = \log_b x$.
Sample	 Use the Area Addition Postulate, the formula for the areas of a
Lessons	triangle and a rectangle to find the areas of figures that are
And	composed of triangles and rectangles
Activities	
Sample	 Quizzes
Classroom	 Take-home worksheets
Assessment	 Tests
Methods	
	<u>Publications:</u>
Sample	• <u>Geometry</u> , Jurgensen, Brown, Jurgensen (McDougal Littell)
Resources	• <u>Geometry: Concepts and Skills</u> , Larson, Boswell, Stiff