Mathematics **Brunswick School Department**

Geometry CP
Unit 9: Area and Volume of Solids

Essential Understandings	▪ Area and volume of solids have many real-life applications.
Essential Questions	▪ What is surface area? ▪ What is lateral area? ▪ What is volume? ▪ What are some of the basic geometric solids? ▪ How do we find areas and volumes of geometric solids? ▪ How can we use area and volume to solve other real-life situations? ▪ What are similar solids? ▪ What is the relationship between the areas and the volumes of similar solids?
Essential Knowledge	▪ Surface area measures the area of the two-dimensional boundary of the three-dimensional figure. ▪ Volume measures the space "inside" the three-dimensional figure.
Vocabulary	<u>Terms</u>: o prism, pyramid, cylinder, cone, sphere, great circle, hemisphere, height, lateral height, slant height, area of the base, lateral area, total surface area, volume, similar solids
Essential Skills	▪ Find the lateral area, total surface area, and volume of prisms, pyramids, cylinders, cones, spheres, and hemispheres. ▪ Find the surface area and/or volume of solids that are formed by combining other solids (examples: a cone with a hemisphere, or a sphere inscribed in a cylinder). ▪ Use proportions to find the areas and volumes of similar solids.

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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	▪ Give the class various three-dimensional figures and the cost of materials in dollars per square unit. Ask them to calculate the cost to fabricate the figure.
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 o Geometry: Concepts and Skills - McDougal Littell