

FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Geometry **Unit Name: Around the Outside and in the Inside: Lateral Area, Surface Area, Volume**

Quality Core Objectives:

| Unit 9 Around the Outside and in the Inside: Lateral Area, Surface Area, Volume | | |
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| B.1. Mathematical Processes | a. | Apply problem-solving skills (e.g., identifying irrelevant or missing information, making conjectures, extracting mathematical meaning, recognizing and performing multiple steps when needed, verifying results in the context of the problem) to the solution of real-world problems |
| | c. | Represent data, real-world situations, and solutions in increasingly complex contexts (e.g., expressions, formulas, tables, charts, graphs, relations, functions) and understand the relationships |
| | d. | Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly |
| | f. | Make mathematical connections among concepts, across disciplines, and in everyday experiences |
| | g. | Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established) |
| | h. | Apply previously learned algebraic concepts in geometric contexts |
| D.4. Solids | a. | Identify and classify prisms, pyramids, cylinders, cones, and spheres and use their properties to solve problems |
| | b. | Describe and draw cross sections of prisms, cylinders, pyramids, and cones |
| E.1. Similarity and Congruence | f. | Apply relationships between perimeters of similar figures, areas of similar figures, and volumes of similar figures, in terms of scale factor, to solve mathematical and real-world problems |
| F.2. Lateral Area, Surface Area, and Volume | a. | Find the lateral area, surface area, and volume of prisms, cylinders, cones, and pyramids in mathematical and real-world settings |
| | b. | Use cross sections of prisms, cylinders, pyramids, and cones to solve volume problems |
| | c. | Find the surface area and volume of a sphere in mathematical and real-world settings |

Purpose of the Unit: Students will find the surface area and volume of solid figures

Prerequisites: Areas of polygons and circles

Daily Lesson Guide

| Day | Lesson Content and Daily Focus Questions | Tasks/Procedures | | Engagement | Assessment and/or Accommodations |
|-----|--|--|---|--|---|
| | | Knowledge and Comprehension Activities | Critical Thinking (High Yield / Literacy /LTF/etc.) | | |
| 1 | <p>How many corners does a tissue box have? How many flat surfaces? How many edges?</p> <p>What types of cross sections can be formed by a plane and a cylinder?</p> | | Derive Euler’s formula from Activity. | <p>Group students. Provide various polyhedrons and determine vertices, edges and faces.</p> <p>Use dry erase boards to model the cross sections.</p> | |
| 2 | <p>Surface Area of Prisms and Cylinders How can I determine the area of this tote bag? (rectangular prism) Design a sports bag (cylinder)</p> | | Use FAL for Tote Bag | | What advice would you give to someone constructing this sports bag? |
| 3 | <p>Surface Area of Pyramids and Cones</p> <p>Use clock tower example</p> | | | | Pg 713 9-23 odds |

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| | <p>to find the area of pyramid. What polygons make up this pyramid?</p> <p>Compare and contrast a cone and pyramid.</p> | | | | |
| 4 | Mid Chapter Quiz | | | | |
| 5 | <p>Volume of Prisms and Cylinders</p> <p>What is the area of this base? What if I stack this paper 3 inches high? 6 inches high? What if it leans over?</p> | | | Stack paper or records to show that right and oblique have the same base and height. | |
| 6 | <p>Volumes of Pyramids and Cones</p> <p>Use models filled with rice to derive the formula for pyramids and cones.</p> <p>What fraction of the cylinder will the cone fill?</p> | | | | |

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| | <p>Note that they have the same base and height? What fraction of the prism will the pyramid fill?</p> | | | | |
| 7 | <p>Surface area of Spheres</p> | | | <p>Use oranges to determine the surface area of spheres.</p> | |
| 8 | <p>Volume of Spheres</p> | | | <p>Use the ice cream cone problem to determine if the ice cream will overflow the cone.</p> | |
| 9 | <p>Review concepts of 3d surface areas and volumes</p> | | | | |
| 10 | <p>Summative Assessment</p> | | | | |