Unit 6
Surface Area and Volume

Grade 10 Applied

Lesson Outline

BIG PICTURE

Students will:

- perform everyday conversions between the imperial system and the metric system to solve problems involving surface areas and volumes of three-dimensional figures as they apply to a variety of occupations.

Day	Lesson Title	Math Learning Goals	Expectations
1, 2	It's About Conversions *(lessons not included)*	• Brainstorm situations where students have seen and used the imperial system. • Group units taken from the imperial and metric system as measures of mass, volume, length, or temperature. • Take measurements around the school using the imperial system. • Discover unit relationships within the imperial system. • Perform everyday conversion of length and volume, within the imperial system, using a variety of methods, e.g., conversion table.	MT3.01, MT3.02 CGE 7f
3	Estimates and Conversions *(lesson not included)*	• Identify the best metric estimate of an object. • Identify the best imperial estimate of an object. • Associate common objects with measure, e.g., given one object, suggest the most appropriate imperial measure to use. • Construct a conversion table, e.g., create posters that display conversion factors, for conversions between imperial and metric measures.	MT3.02 CGE 7f, 7i
4	It's About the Plane *(lesson not included)*	• Conduct placemat activity to access students' prior knowledge of perimeter and area. • Solve problems relating to the perimeter and area of plane figures in the context of an occupation, using imperial measure when appropriate. • Solve composite perimeter and area problems, using imperial measure, as appropriate.	MT3.01 CGE 4b
5	We Need to Convert *(lesson not included)*	• Solve area and perimeter problems that require conversions between the imperial and metric system.	MT3.01, MT3.02 CGE 4b
6	It's About Pyramids *(lesson not included)*	• Determine the surface area of a pyramid through investigation, e.g., use the net of a square-based pyramid to determine that the surface area is the area of the square base plus the areas of the four congruent triangles.	MT3.03 CGE 5b
7	It's About Surface Area *(lesson not included)*	• Find the surface area of several objects. • Relate surface area to finding the area of composite 2-D shapes. • Discuss nets, introduce software, e.g., TABS+, to draw nets.	MT2.03, MT3.04 CGE 3c, 5a
8	Problems Involving the Surface Area of Prisms and Pyramids *(lesson not included)*	• Solve problems relating to the surface area of prisms and pyramids, e.g., provide students with the dimensions of a local landmark and ask them to calculate the amount of paint that would be need to be applied to the exterior. • Discuss the use of the Pythagorean theorem to solve volume and surface area problems.	MT2.03, MT3.04 CGE 4b

Day	Lesson Title	Math Learning Goals	Expectations
9	It's All About Cylinders *(lesson not included)*	• Review formulas for the circumference and area of a circle which will be needed to solve problems involving the surface areas of cylinders. • Solve problems requiring the surface area of cylinders.	MT3.04 CGE4b, 5b
10	Surface Area of Combined Shapes *(lesson not included)*	• Solve surface area problems involving prisms, pyramids, and cylinders, including combinations of these figures, using the metric or imperial system, as appropriate.	MT3.04 CGE 4b
11, 12	Solving Problems Involving Volume *(lessons not included)*	• Activate prior knowledge about volume. • Solve problems involving the volume of prisms, pyramids, cylinders, cones, and spheres, including combinations of these figures, using the metric or imperial system, as appropriate, e.g., provide students with the dimensions of a helium balloon and have them calculate the volume of gas needed to inflate it.	MT3.04 CGE 5b
13	Solving for a Variable in Measurement Problems *(lesson not included)*	• Activate prior knowledge about the concepts of a variable and solving for a variable in the first degree. • Determine the value of a variable in the first degree in the context of a problem, using a measurement formula. • Solve related problems.	MT1.01, MT1.02, MT3.04 CGE 5b
14–16	Design Project *(lessons not included)*	• Choose a project such as: Design and create a three-dimensional package for an object of your choice, measurements in the imperial and metric system to be included or research and report on three careers in Ontario that use the imperial system of measurement. • Present to the class a sample from another discipline that requires the use of the imperial system of measure, e.g., building, cooking, sewing. • Explain the reason for the need to use imperial measure. • Work on the project. • Present their projects to the class.	MT3.01, MT3.02, MT3.04 CGE 3e, 4b, 4f, 5b, 5e
17	Summative Assessment		