

Surface Area and Volume of a Cylinder

Reporting Category Measurement

Topic Determining the surface area and volume of a cylinder

Primary SOL 7.5a The student will describe the volumes and surface areas of cylinders.

Related SOL 7.5b

Materials

- Net of a Cylinder (attached)

Vocabulary

area, net, surface area, volume, circle, cylinder, circumference, radius (earlier grades)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Provide students with a variety of problems concerning surface area and volume. Have students look at each problem and determine whether it involves surface area or volume.
2. Review surface area. Using the definition of surface area and Net of a Cylinder document attached, facilitate a discussion of the surface area of a cylinder. Guide students to understand that the surface area is the sum of the areas of the top, the bottom, and the side (rectangle on the net).
3. Give students additional surface-area problems for practice.
4. Review volume. Using the formula derived when determining the volume of the rectangular prism ($V = Bh$), guide students to write the formula for a cylinder.
5. Give students additional volume problems for practice.

Assessment

- **Questions**
 - How do you determine the surface area of a cylinder?
 - How do you determine the volume of a cylinder?
 - How are volume and surface area related?
- **Journal/Writing Prompts**
 - Describe a practical example of when you would want to know the volume of a cylinder.
 - Describe a practical example of when you would want to know the surface area of a cylinder.
 - Pretend that you are covering an ottoman. Explain how the formula would change if you do not need to cover the bottom of the ottoman.
- **Other**
 - Students will determine the volume and surface area of a soda can.
 - Provide real life cylindrical items (e.g., soft drink can, potato chip can, oatmeal container). Create nets for the items, and measure and determine the volume.

Extensions and Connections (for all students)

- Have students create posters showing the surface area and volume of a cylinder. Posters should include definitions, diagrams, and examples.
- Have each student construct a cylinder and ask a partner to find the surface area and volume. Have students compare their cylinders.
- Given five cylinders, have students put them in order from least to greatest according to volume and surface area.
- Have students design their own label for a cylinder.

Strategies for Differentiation

- Use the formula sheet to stress what each variable represents.
- The base can be related to the floor of the classroom.
- Stress that there are three steps to solving the problem: writing the formula, substituting the values, and solving including proper units.
- Place the net of the cylinder on grid paper.

Net of a Cylinder

