VOLUME OF CYLINDER

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Subject

Mathematics

Prepared By

[Instructor Name]

Grade Level

5

Overview

This lesson plan covers teaching content for;

1. Properties of a cylinder
2. Surface Area of a cylinder
3. Volume of a cylinder

Objectives

Students should be able to;

1. Identify a cylinder
2. State properties of a cylinder.
3. Measure and determine the volume of a cylinder.

Activity Starter/Instruction

1. A cylinder is an object with curved sides and a top and bottom made of flat circles.
2. Student might not notice, but cylinders are part of their everyday life. Soda cans and small candles are cylinders. Even a toilet paper roll is a cylinder.
3. If you want to figure out how much soda is in a can or how much water you can pour into a cup, you are thinking about volume.
4. Volume is the amount of space an object takes up, and this is measured in cubic units.
5. To find volume for a cylinder, we first find the area of the base, or the flat top or bottom of the cylinder, and then multiply it by the height.
6. The base of a cylinder is a circle, so we need to calculate the area of the circle first. The equation for the area of a circle is:
7. $Area\ (a) = \pi r^2$
   r stands for radius

Teacher Guide

Day 1/ Lesson 1: 20mins

1. Facts about cylinder;
   - It has a flat base and a flat top.
   - The base is the same as the top.
   - From base to top, the shape stays the same.
   - It has a curved side.
2. Surface area of a cylinder has these parts;
   Surface Area of Both Ends = $2 \times \boldsymbol{\pi} \times r^2$
   Surface Area of Side = $2 \times \pi \times r \times h$
   Which together makes;
   Surface Area = $2 \times \pi \times r \times (r + h)$
3. Volume of a cylinder: To calculate the volume we multiply the area of the base by the height of the cylinder
4. Area of the base: $\pi \times r^2$
   Height: h
   Volume = $\pi \times r^2 \times h$
5. If the height of a cylinder is 7 and the radius is 2, what is the volume?
6. Volume = $\pi \times r^2 \times h$
   = $\pi \times 2^2 \times 7$
   = $28\ \pi$
7. ~ 87.96

Materials Required

- Cylinders of different sizes (i.e. soup cans, soda cans, ch
- Chart paper
- Markers
- Rulers
- White board

Additional Resources

- https://betterlesson.com/lesson/635909/cylinder-volu
- https://www.learner.org/interactives/geometry/volur
- https://illuminations.nctm.org/uploadedFiles/Content/8/Popcorn-AS-Cylinders.pdf
- https://www.mathexpression.com/volume-of-a-cylinc
- https://sciencing.com/teach-geometric-volume-kids-2
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Additional Notes

Guided Practice

Day 2/ Lesson 2: 15 Mins

1. Show students a cylinder, such as a soda can. Model for the students how to measure the radius of the cylinder's base and the height using a ruler.
2. Discuss how to find the volume of a cylinder using the formula: $V = \pi r^2 h$.
3. Divide the class into teams.
4. Give each team five cylinders, rulers, chart paper, and markers.
5. Have the teams measure the radius and height for each cylinder with their rulers and calculate each cylinder's volume on their chart paper.
6. The first team to correctly measure the volume of all of their cylinders wins.

pi (π) = 3.14.

8. Remember that radius measures the distance from the edge of the circle to its center. Pi is a special number that can be used to figure out the area of a circle.
9. A cylinder has a radius of 2 inches, and height of 5 inches.
10. We will first find the area of the bottom circle.
    $A = pi \times r^2$
    $= 3.14 \times 2^2$
    $= 3.14 \times 4$
    $= 12.56$ sq. inches
11. Base = 12.56 sq. inches, to know how much space makes up the entire cylinder, multiply the area of the base by the height.
12. Volume of cylinder = area of the base × the height
    $= 12.56 \times 5$
    $= 62.8$ inches cubed
13. Volume of cylinder = 62.8 inches cubed.

Guided Practice

Day 3/ Lesson 3: 20mins

1. You want to really give your students incentives to learn how to calculate the volume and surface area of a cylinder? Bring in cans of soda.
2. Give them each a ruler and a can of soda.
3. Tell them you need both the volume and the surface area of the can or they don't get to drink it
4. Watch the precision to which they measure and calculate
5. Variation:
6. Don't like soda or drinks in the classroom? Use paper,
7. Have them color it first
8. Than tape it
9. Then measure and calculate.

Summary	Assessment Activity	Assessment Activity
1. Go over the activities with students and see how well they understand them.	1. Students need to understand the steps involved to get the volume of a cylinder.	Assess if students can 1.Identify a cylinder. 2.Solve volume problems involving cylinder correctly.