

Core Content

Cluster Title: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
Standard: Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
Concepts and Skills to Master
<ul style="list-style-type: none"> • Understand when and how to use formulas for volume of cones, cylinders, and spheres. • Apply volume formulas to real-world problems.

Supports for Teachers

Critical Background Knowledge	
<ul style="list-style-type: none"> • Represent rational approximations of irrational numbers such as pi. • Solve equations involving square roots and cube roots. • Understand that volume is measured in cubic units. 	
Academic Vocabulary	
pi, π , radius, slant height, height, volume, hemisphere, diameter	
Suggested Instructional Strategies	Resources
<ul style="list-style-type: none"> • Use physical models to compare volumes of cones and cylinders using water or rice. • Derive the formula for cylinders using physical models. • Explore questions such as “why is the volume of a cone 1/3 the volume of a cylinder of the same base?” • Compare and contrast the formulas for cones, cylinders, and spheres. 	
Sample Formative Assessment Tasks	
<p>Skill-Based Task A silo has 1500 ft³ of grain. The grain fills the silo to 20 ft. in height. What is the radius of the silo?</p> <p>What is the relationship between the volume of a cylinder and a cone with the same radius and height?</p>	<p>Problem Task What does the height of the cone need to be so that one spherical scoop of ice cream with the same radius as the cone won't overflow if it all melts?</p> <p>A Christmas tree is 7 feet tall with a 5-foot diameter at the base, with one foot between the floor and the lowest branch. How far up the tree should your first of two strings of lights end so that you will have enough lights to evenly fill the Christmas tree?</p>