learning focus:

✓ use formulas to find the volume of cylinders, cones, and spheres

✓ describe the formula for a cylinder in terms of its base area and height

✓ use formulas for volume to solve mathematical and real-world problems

VOLUME UNIT
7 DAY CCSS-ALIGNED UNIT

8th GRADE

A MANEUVERING THE MIDDLE ® RESOURCE

VOLUME

a 7 day CCSS-aligned unit
CCSS: 8.G.9

8th GRADE

ready-to-go, scaffolded student materials

VOLUME UNIT
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VOLUME

a 7 day CCSS-aligned unit
CCSS: 8.G.9

8th GRADE

student friendly + real-world application

scaffolded concepts

Unit: Volume
Student Handout 4

Name _____
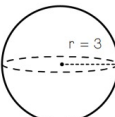Date _____ Pd _____

VOLUME OF SPHERES

VOLUME OF SPHERES
- A sphere is a three-dimensional figure where every point on its surface is the same distance from its _____.
- The formula for the volume of a sphere is _____, or _____.
- Half of a sphere is

Use the formula above to find the volume _____ hundredth.

1
r = 3
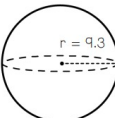
FORMULA:
PLUG IN VALUES:
IN TERMS OF PI:
NEAREST HUNDREDTH:

3
r = 9.3

FORMULA:
PLUG IN VALUES:
IN TERMS OF PI:
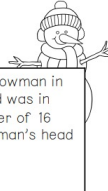NEAREST HUNDREDTH:

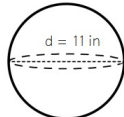Use the formula for the volume of spheres to help you answer each question below.

5. A hemisphere has a radius of 7 inches. Find the volume of the hemisphere to the nearest tenth.

6. Gabriel and his brothers built a snowman in their backyard. The snowman's head was in the shape of a sphere with a diameter of 16 inches. Find the volume of the snowman's head to the nearest tenth.

7. A sphere has a volume of 288π in³. radius of the sphere.

9. Zola solved a question on her math t below in terms of π. Explain Zola's err

d = 11 in

10. A sphere, cylinder, and cone all hav equal to the diameter of the sphere. Lo

_____ a. The area of the cylinder's
_____ b. I can find the volume of th
_____ c. The volume of the sphere

Summarize today's lesson:

Unit: Volume
Homework 4

Name _____
Date _____ Pd _____

VOLUME OF SPHERES

In 1-4, draw a line connecting each sphere to its volume in terms of π, then to the volume rounded to the nearest tenth. Not all choices will be used.

SPHERE	VOLUME (IN TERMS OF PI)	VOLUME (NEAREST TENTH)
1. d = 9	457.$\overline{3}$π units³	3,053.6 units³
	121.5π units³	67 units³
2. r = 2	21.$\overline{3}$π units³	33.5 units³
3. d = 14	10.$\overline{6}$π units³	381.7 units³
	972π units³	10,052.2 units³
4. r = 9	3,201.$\overline{3}$π units³	1,436.8 units³

5. Find the volume of a hemisphere that has a radius of 8 centimeters to the nearest tenth.

6. A magic 8-ball has a diameter of 5 inches. It is filled 85% full with blue water. How much space is occupied by the water? Round to the nearest tenth.

⑧

7. A sphere has a volume of 36π in³. Find the radius of the sphere. Use 3.14 for pi.

8. A sphere has a volume of 2,304π mm³. Find the diameter of the sphere.

skill application

A MANEUVERING THE MIDDLE® RESOURCE

VOLUME

8th GRADE

streamline your planning process with unit overviews

✓ key vocabulary

✓ vertical alignment

sample pacing calendar

VOLUME UNIT
OVERVIEW

CCSS

STANDARDS

8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

BIG IDEAS

- Formulas can be used to find the volume of cones, cylinders and spheres, and calculating volume can help us solve both mathematical and real-world problems.

ESSENTIAL QUESTI

- What is meant by the volume
- How are the volumes of con
- What are the different variab represent?
- How is finding the volume of similar?

VOLUME UNIT
PACING GUIDE

CCSS

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Volume of Cylinders	Volume of Cones	Applying Volume of Cylinders and Cones	Volume of Spheres	Applying Volume of Spheres
Student Handout 1 Homework 1	Student Handout 2 Homework 2			

DAY 6	DAY 7
Volume Study Guide	Volume Test
Review	Test

VOLUME UNIT
OVERVIEW

CCSS

TOPIC	TEACHING TIPS
Volume of Cylinders	• I like to help students visualize the volume formula by showing a stack of coins (or another circular item) to demonstrate that the volume of the stack is equal to the area of one coin multiplied by the height of the stack. A sleeve of circular crackers would also be a great visual.
Volume of Cones	• Take a cylinder and a cone with the same sized base and same height, and have students predict how many of the cones would fit inside the cylinder. Then, demonstrate by filling the cone with rice (or another substance) and pouring it into the cylinder three times.
Volume of Spheres	• Visit http://kera.pbslearningmedia.org and search "Comparing Volumes of Cylinders, Spheres and Cones." This interactive tool will allow students to see the relationship between the volume of a sphere and a cylinder with the same height and radius. (You can also select "Cone" to show the relationship between the volume of a cone and cylinder with the same height and radius).
Using the Formulas	• This unit will involve a lot of formulas, and hopefully showing work! Vary the practice by allowing the students to use dry erase markers every now and then. • It can be hard for students to remember that "B" in the formula requires an extra step of calculating the area of the base. I like to tell students that a capital letter in the formula usually means that there will be work involved to find it.

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teaching ideas

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8th GRADE

unit study guide + assessments
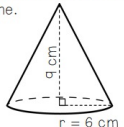
✓ **quizzes**

✓ **editable unit test**

Unit: Volume
Mini-Quiz 1

Name _____
Date _____ Pd_____

### VOLUME OF CYLINDERS AND CONES MINI-QUIZ

Solve each of the problems below. Round solutions to the nearest tenth when necessary.
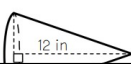
1. Find the volume of the cone.

9 cm

r = 6 cm

2. Find the volume of the cylinder.
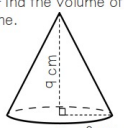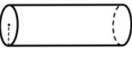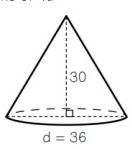
r =

3. Find the volume of the cone.

d = 8 in | 12 in

4. A cylinder has a volume of 198 cm³, base has an area of 22 cm². What is the height of the cylinder?

Unit: Volume
Mini-Quiz 1

VOLUME OF CYLI

Solve each of the problems below. Round

1. Find the volume of the cone.

9 cm

r = 6 cm

2. Find cylind

r =

4. A cylinder has a volume of 198 cm³, base has an area of 22 cm². What is the height of the cylinder?

Unit: Volume
Review

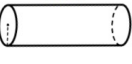Name _____
Date _____ Pd _____

VOLUME STUDY GUIDE

Solve each of the problems below. Be sure to ask questions if you need more help with a topic.

I CAN USE A FORMULA TO FIND THE VOLUME OF CYLINDERS.

1. What is the formula used to find the volume of a cylinder? Describe the steps to find the volume of a cylinder in your own wor

2. Find the volume of the cylinder. Leave your answer in terms of π.
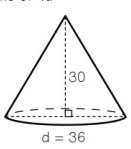
24 mm

r = 8 mm

3. F cyli

I CAN USE A FORMULA TO FIND THE VO

5. Laura is trying to find the volume So far, she has found the area of th the cone and multiplied it by the heig cone. Describe what she needs to do

7. Find the volume of the cone in terms of π.

30

d = 36

8. F to t

EIGHTH GRADE CURRICULUM

VOLUME

UNIT TEN: ANSWER KEY

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answer keys included