6th Basic

7th Advanced

Helping With Math

USA GRADES

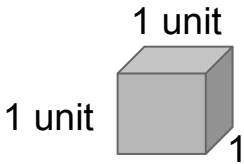
Volume of Cylinders, Cones, and Spheres

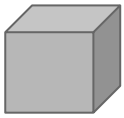
Suitable for students **aged 10-12**

This pack is suitable for learners aged 10-12 years old or 6th to 7th graders (USA). The content covers fact files and relevant basic and advanced activities involving word problems about the volume of cylinders, cones, and spheres.

Volume refers to the capacity (amount) of a space occupies with a 3 dimensional objects.

It is measured in "cubic" units. The volume of a figure is equal to the number of cubes required to fill it completely, like blocks in a box.



How many of this  can fit in a cube whose dimensions are 12 ft, 10 ft, and 5 ft?

SOLID FIGURES

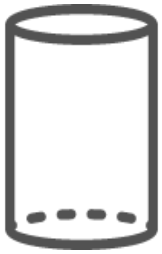
Solid figures are three-dimensional figures that have length, width and height.

CONCEPTS

$V = 4/3(\pi r^3)$

Sphere

It is a figure with a curved surface in which all points on the surface are equidistant from the center.



$V = \pi r^2 h$

Cylinder

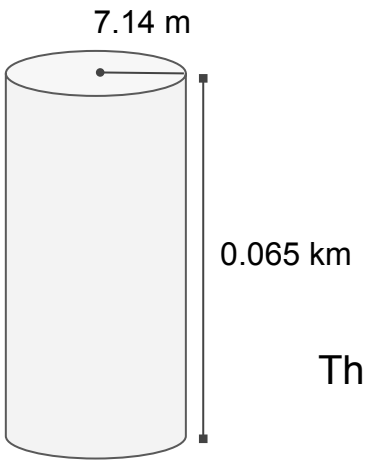
It is a solid figure that has two congruent or equal circular bases that are parallel.

Cone

It is a solid figure that has a circular base connected to a vertex.

$V = \frac{1}{3} \pi r^2 h$

where r = length of the radius and h = height.



Let r = 7.14 m and h = 0.065 km or 65 m, $\pi = 3.14$

$V = \pi r^2 h \longrightarrow V = (3.14)(7.14\ m)^2 (65\ m)$

$V = 10, 404. 94\ m^3$

The volume of the cylindrical object is **$10, 404. 94\ m^3$**.

SAMPLE/APPLICATION

The radius of the sphere is 4 ft.

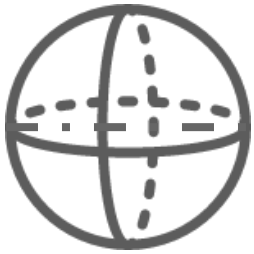
$V = 4/3(\pi r^3)$

$V = 4/3(\pi)(4)^3$

$V = 4/3(\pi)(64)$

$V = 4/3(64\pi)$

$V = 85.33\pi \text{ ft}^3$



The radius is 20 in and the height is 50 in.

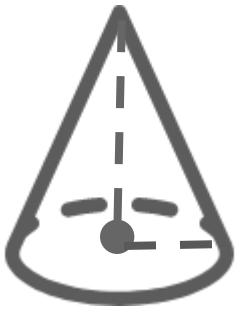
$V = \frac{1}{3}\pi r^2 h$

$V = \frac{1}{3}\pi(20)^2(50)$

$V = \frac{1}{3}\pi(400)(50)$

$V = \frac{1}{3}\pi(20000)$

$V = 6666.67\pi \text{ in}^3$



List down the name of the sports-related objects that you can find at your house with cone, cylinder, and sphere-like shapes.

TABLE OF ACTIVITIES

TUMBLER FOR SALE

G6 Basic

The entire basketball team would like to buy a new set of tumbler. They found unique designs (cone shaped and a cylindrical shape) inside the mall. Calculate the volume of each tumbler given their dimensions.

Solid Figures	Dimensions
1. Cone	r = 2.76 m h= 5. 19 m
2. Cylinder	r = 14 ft h= 55 ft

Illustration: Cone	Illustration: Cylinder
Solution:	Solution:

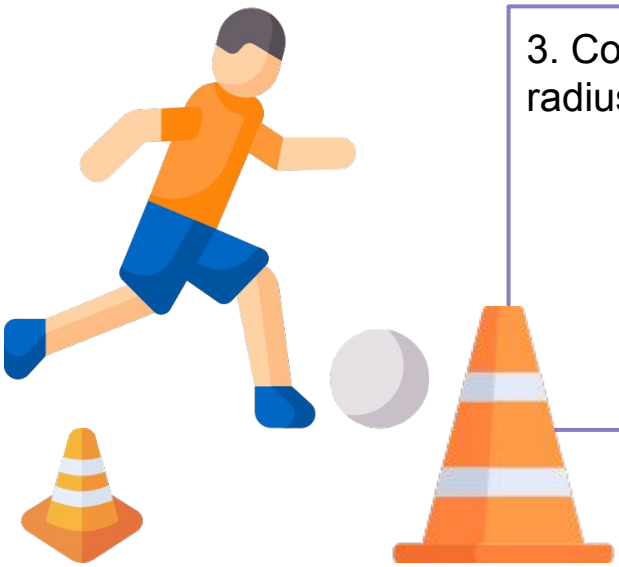
IT'S TRAINING DAY!

G6 Basic

Today is a training day for the athletes. They are going to use these cones. But can you also help them solve the following problems?

1. The diameter of this cone is 1.8 ft. Its height is 1.5 ft. What is its volume?

2. The height of a cone-like figure is 18 inches. The volume of the figure is 301.44 cu. in. What is the measurement of its radius?



3. Compare the volume of a cone if the radius has doubled in length.

DRIBBLING EXERCISE

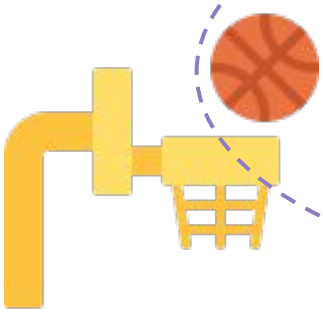
G6 Basic

Help Alen and Mike finish the dribbling exercise today by solving for the volume of these spheres.

1. The radius of the given sphere is 6.2 in. Compute for its volume.

2. What is the radius of a sphere whose volume is 7,234.56 cubic cm?

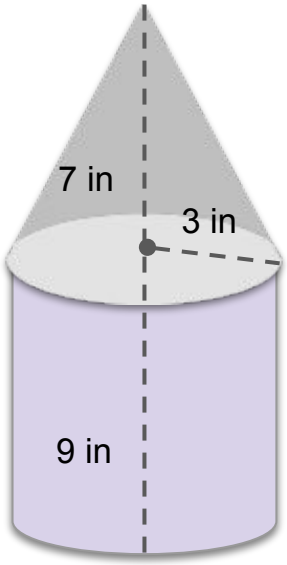
3. The diameter of the given sphere is 30 cm. Compute for its volume.



A NEW SET OF TRAINING CONES

G6 Basic

These talented volleyball players are going to try the new training cones. Also before using it, they would like to know the volume of each. Can you help them answer these questions?



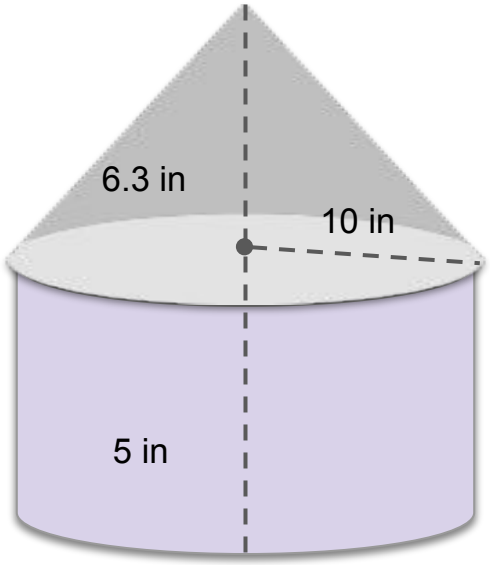
1. Which two solid figures this given image composed of?

_____

2. Compute for the total volume of the figure.

3. Compute for the total volume of the figure.

4. Compare the volume of the two figures. How different they are from each other?



BASKETBALL GAME MOMENTS

G6 Basic

These are some basketball game moments. Use your understanding of volume to solve for the answer.

1. By the basketball court, ice cream cones with 10 in height and 5 in radius are being sold. Find the cone's volume.

a.160.8 in^3 b. 261.8 in^3 c. 360.8 in^3

2. The players' favorite drink has a height of 11 cm and a radius of 6 cm. Find its volume.

a. 1,423.44 cm^3 b. 1,342.44 cm^3 c. 1,244.07 cm^3

3. A three-point shot was made by Bryan using a 15 cm radius ball. Find the ball's volume.

a.10,130 cm^3 b. 12,130 cm^3 c. 14,137 cm^3

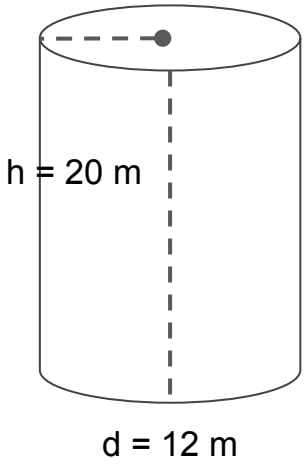
4. Lots of basketballs are rolling on the court. Each has a radius of 17 cm. What is the volume of the ball?

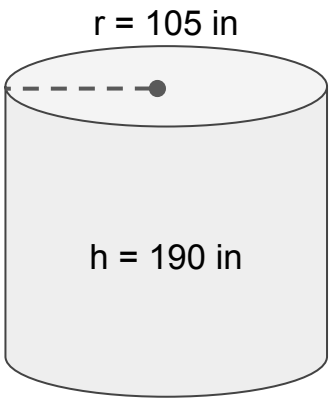
a. 20,100.59 cm^3 b. 20,579.53 cm^3 c. 20,500.59 cm^3

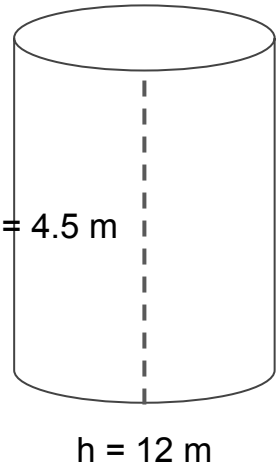
THE WATER TANKS

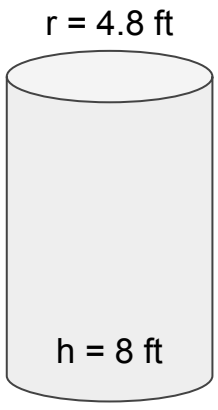
G7 Advanced

These water tanks keep the HWM Sports Stadium clean. Solve for the number of cubic units it can hold.









1.

2.

3.

4.

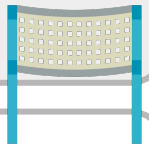
SPHERICAL SPORTS OBJECTS

G7 Advanced

Spherical objects are useful in sports! Apply your math skills to solve these sports-related problems.

Find the volume of the volleyball used for practice with a 21.3- cm diameter.

Find the volume of a spherical sport object whose radius is 4 cm.



A softball has a volume of 125/6 π cubic inches. Find the radius of the softball.

Meg practices her spike using a ball with 15 cm radius? Find the volume.

Find the diameter of a spherical sport object whose volume is 972π cubic mm.

268.1 cm^3

14137.17 cm^3

2.5 in

18 mm

5059.85 cm^3

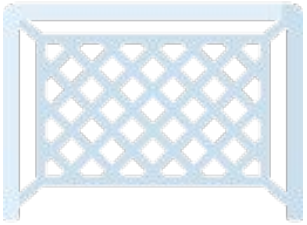
9 mm

SILO AT THE HWM SPORTS AREA

G7 Advanced

The silo at HWM Sports area needs some accurate measurement. Refer to the activity given below and make sure to accomplish them all!

Using the image here. Write the dimensions of the silo.



One-half of a sphere is called a hemisphere. The top of the silo is a hemisphere with a radius of 15 feet. The silo is a 60-ft tall structure. What is the volume of the silo? Round your answer to the nearest thousand.

SPORTS OBJECTS AT HOME

G7 Advanced

Geometry and sports are good combination of fun in life! What sports objects do you have at home? Get them ready for the activity below.

Look for three sports objects at home. They must be in a shape of either cone, cylinder, or sphere (much better if each has a representative). After that, complete the details of the table below.

Name of the Sports Object	Dimensions	Volume of the object

THE SPORTSMANSHIP AWARD

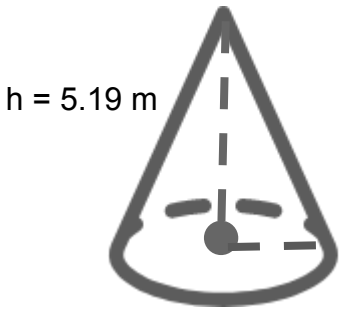
G7 Advanced

The Sportsmanship award for this year goes to the athlete who realizes the importance of this lesson in his/her life. For you to qualify, you need first to answer these essay questions.

- How do we apply this lesson in real life?
- What are the two specific life scenarios that you can give where volume of cones, spheres, and cylinders are used to solve problems?

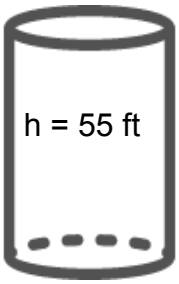
ANSWER GUIDE

Activity 1



r = 2.76 m

V = 41.4 cubic meters



r = 14 ft

V = 33866. 37 cubic ft.

Activity 2

1. 1.27 cubic ft.
2. R = 4 in
3. The volume becomes four times larger.

Activity 3

1. 998.31 cubic in.
2. R = 12 cm
3. 14137.17 cubic cm

Activity 4

1. Cone and cylinder
2. Cone = 65.97 Cylinder = 254.47
Total V = 320.44 cubic in
3. Cone = 659.73 Cylinder = 1570.8
Total V = 2230.53 cubic in
4. The second solid has a larger volume because of its larger radius than the first.

Activity 5

1. B 2. C 3. C 4. B

Activity 6

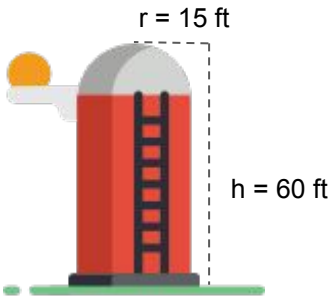
1. 2261.95 cubic m
2. 6.58 x 10^6 cubic in
3. 763.41 cubic meters
4. 579.06 cubic feet

Activity 7

1. 5059.85 cm^3
2. 268.1 cm^3
3. 2.5 in
4. 14137.17 cm^3
5. 18 mm

ANSWER GUIDE

Activity 8



1. Cylinder = 31808.63
Hemisphere = 14137.17/2 = 7068.59
Total V = 38877.22 cubic ft.

Activity 9

Answers may vary,

Activity 10

Answers may vary,

Copyright Notice

Thank you

Thank you so much for purchasing and downloading this resource.

We hope it has been useful for you in the classroom and that your students enjoy the activities.

For more teaching and homeschooling resources like this, don't forget to come back and download the new material we add every week!

Thanks for supporting **Helping With Math**. We can provide teachers with low-cost, high-quality teaching and homeschooling resources because of our loyal subscribers and hope to serve you for many years to come.

- The Entire Helping With Math Team :)