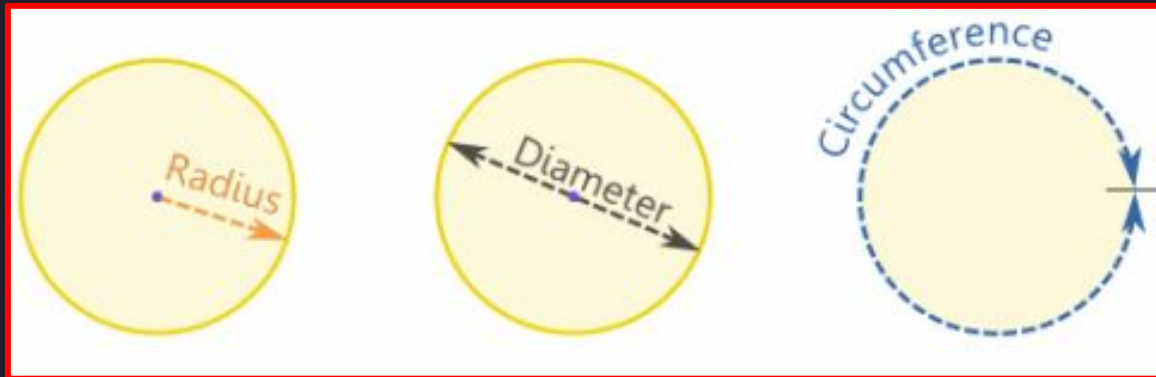
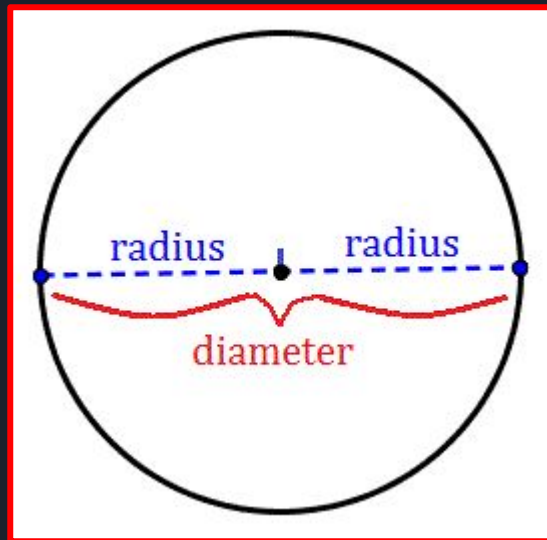




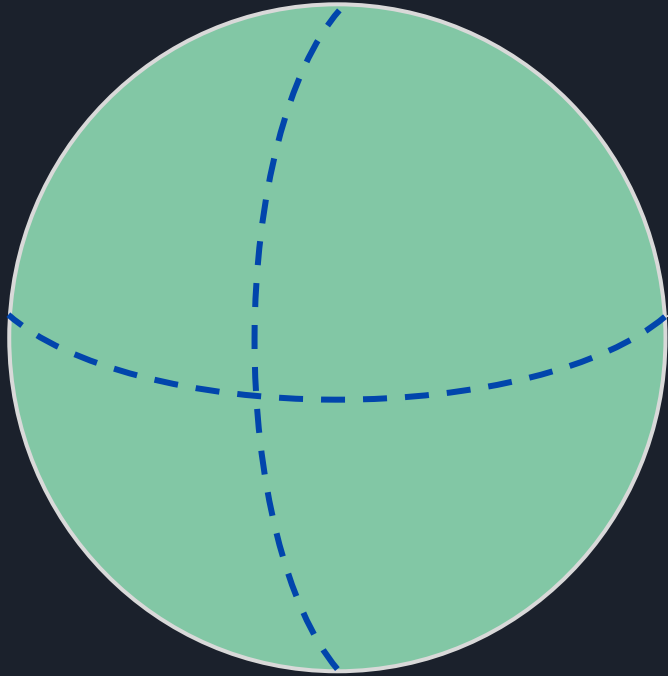
# Calculating Volume

3D Measurements and Analysis

# Review



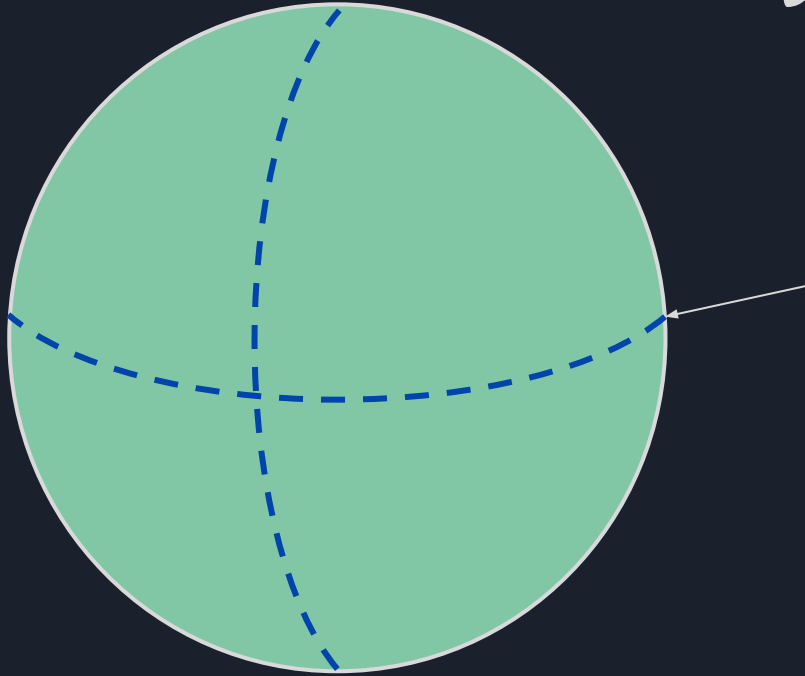
## Determining Volume of Spheres



**Circumference:** the distance around the widest portion of the sphere

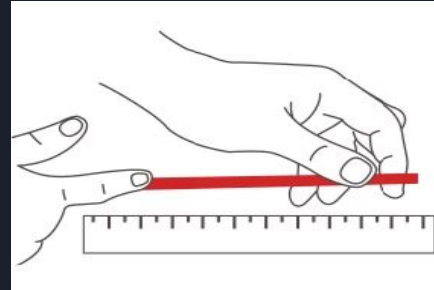
$$\text{Circumference} = 2 \pi r = \pi D$$

## Determining Volume of Spheres



Wrap a string around the widest part of the sphere to measure the circumference.

Lay the string against the ruler to determine the measurement for circumference.



$$C = 2 * \pi * r \quad \text{or} \quad C = \pi * D$$

If circumference (C)= 15 cm

What is the diameter(D)?

What is the radius? (r)

$$C = \pi * D$$

If circumference = 15 cm

What is the diameter?

$$15 \text{ cm} = \pi D$$

$$(15 \text{ cm}) / \pi = (\pi D) / \pi$$

$$D = 15 \text{ cm} / \pi$$

$$D =$$

$$C = 2 * \pi * r$$

If circumference = 15 cm

What is the radius?

$$15 \text{ cm} = 2 \pi r$$

$$(15 \text{ cm}) / 2 \pi = (2 \pi r) / 2 \pi$$

$$r = (15 \text{ cm}) / (2 \pi)$$

$$r =$$

$$C = \pi * D$$

If circumference = 15 cm

What is the diameter?

$$15 \text{ cm} = \pi D$$

$$(15 \text{ cm}) / \pi = (\pi D) / \pi$$

$$D = 15 \text{ cm} / \pi$$

$$D = 4.775 \text{ cm}$$

$$C = 2 * \pi * r$$

If circumference = 15 cm

What is the radius?

$$15 \text{ cm} = 2 \pi r$$

$$(15 \text{ cm}) / 2 \pi = (2 \pi r) / 2 \pi$$

$$r = (15 \text{ cm}) / (2 \pi)$$

$$r = 15 \text{ cm} / (6.28)$$

$$r = 2.389 \text{ cm}$$

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

If radius =  $(15 \text{ cm}) / 2 \pi = 15 \text{ cm} / (6.28)$   
= 2.389 cm

Volume =  $(4/3) * 3.14 * (2.389 \text{ cm})^3$   
=  $(4/3) * 3.14 * (13.635 \text{ cm})$   
= 57.11 cm<sup>3</sup>



## Mystery Candy Count

If a candy jar is close to a sphere, with a circumference of 17 in., and it is filled with Skittles, which have a diameter of 0.5 in., how many skittles are in the jar?




$$C = 2 * \pi * r$$

If circumference of jar = 17 in

What is the radius?

$$17 \text{ in} = 2 \pi r$$

$$(17 \text{ in}) / 2 \pi = (2 \pi r) / 2 \pi$$

$$r = (17 \text{ in}) / (2 \pi)$$

$$r = (17 \text{ in}) / (6.28318)$$

$$r = 2.706 \text{ in}$$



## Volume of Jar

$$\begin{aligned} &= (4/3) * 3.14 * (2.706 \text{ in})^3 \\ &= (4/3) * 3.14 * (19.815 \text{ in} * \text{in} * \text{in}) \\ &= (4/3) * 3.14 * (19.815 \text{ in}^3) \\ &= 83.001 \text{ in}^3 \end{aligned}$$

# Volume of Skittle

Diameter of Skittle = 0.5 in

Radius =  $D / 2 = 0.5 \text{ in} / 2$

Radius = 0.25 in

Volume =  $(4/3) * 3.14 * (0.25 \text{ in})^3$

=  $(4/3) * 3.14 * (0.0156 \text{ in}^3)$

= 0.0654 in<sup>3</sup>

If you have a sphere jar of marbles. The jar has a diameter of 20 cm and a marble has a diameter of 1 cm. How many marbles can fit in the jar?

Diameter = 20 cm  
radius = 10 cm

$$\text{Volume} = \left(\frac{4}{3}\right) * 3.14 * (10)^3$$

$$\text{Volume} = 1.33 * 3.14 * 1000$$

# Calculating the Number of Skittles

Volume of Jar / Volume of Skittles

$$83.001 \text{ in}^3 / 0.0654 \text{ in}^3$$

1,269 skittles in a completely spherical jar

Our jar was flat on the bottom so you may want to remove a few skittles.

## Practice

How many Skittles would fit in a sphere jar that has a circumference of 14 cm?

## Volume of a Cylinder Challenge:

$$\text{Volume} = \pi * 2 * r * h$$

How many gummy bears would fit into a cylindrical cup? Measure the gummy bears by (l\*w\*h)

Measure your cup's height and diameter.  
Measure the gummy bear.