

Warm Up: A **frustum** may be formed from a right circular **cone** by cutting off the tip of the **cone** with a cut perpendicular to the height, forming a lower base and an upper base that are circular and parallel.



A 0.41 caliber bullet has a diameter of 9.8 mm and a case length of 28.9 mm. The cylindrical portion of the bullet has a case length of 15 mm. The top of the bullet is a frustum. The “missing cone tip” has a radius of 5.5mm and a height of 20 mm. Calculate the volume of the bullet.

Surface Area of Spheres

A sphere is a round ball-shaped three dimensional solid. Every point on the surface of the sphere is the same distance from the centre of the sphere.

Orange Demonstration:

<https://www.youtube.com/watch?v=FB-acn7d0zU>

Another Video of interest:

https://www.youtube.com/watch?v=T_DBkFnr4NM

Demonstration using Surface Area of Cylinder:

<https://www.youtube.com/watch?v=Fyvq-jIQKr8>

Surface Area of a Sphere: $A_{\text{total}} =$

Example 1: An adult human eyeball has a diameter of 2.5 cm. Calculate the surface area of the eyeball, to the nearest tenth of a square centimeter.

Example 2: The radius of a sphere is tripled. Does this triple the surface area of the sphere? Explain.

Example 3: The surface area of an orange is 147 cm^2 . What is the diameter of the orange? Round your answer to two decimal places.



Example 4: A spherical balloon is blown up, covered in paper maché and painted. The surface area of the masterpiece is $400\pi \text{ cm}^2$. A hole is drilled through the sphere in order to hang the sphere like a necklace from the ceiling. The chain used to hang the sphere must be 1.2 m on either side of the sphere. The chain costs \$48/m, what is the total cost of the chain including 13% taxes?

