

Geometry B Live Lesson Class

U6L6 – Surface Areas and Volumes of Spheres

(Chapter 11-5 in textbook)



Agenda



1. Review topics and problems from U6L6 – Surface Areas
Volumes of Spheres

2. Use the 2-column note system to take better notes in math class. Bring your math notebook and pen or pencil to each math LiveLesson class.

2-Column Notes Template



1. Announcements/To Do's
2. School-Wide Learner Outcomes
3. LL Objectives
4. Vocabulary words
5. Problems
6. Summary (End of class)

1. Write down important details.
2. What are you going to work on this week?
- 3.
4. Definitions (fill in as we go)
5. Steps to solving problems
6. 1 or 2 sentences about the LL class.

Reminders and To – Do's



Information

1. Complete 1 math lesson per day.
2. Check your WebMail every day
3. Be prepared to spend 4 - 6 hours per day on schoolwork.
4. Remind your Learning Coach to take daily attendance

What to do

1. Go to your Planner in Connexus to find the math lesson for the day
2. Go to Connexus to find WebMail
3. Complete lessons for the day from your Planner. Do not get behind on lessons.
4. Have your Learning Coach log into Connexus daily.

Reminders and To – Do's



Information

5. Go to the Message Board first for information about our math class.

6. Contact Mr. Elizondo for math questions.

Remember: You need at least 2 phone calls with Mr. Elizondo per semester.

What to do

6. Call (559) 549 - 3244 and leave a voicemail if call is not answered.

Make an appointment at:
<https://elizondo.youcanbook.me>

Send a WebMail

U6L6 – California Common Core State Standards



- HSG-MG.A.1: Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
- HSG-GMD.A.3: Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

U6L6 – Vocabulary



- sphere
- center of a sphere
- radius of a sphere
- diameter of a sphere
- circumference of a sphere
- great circle
- hemisphere

U6L6 – Objectives



- To find the surface area and volume of a sphere.

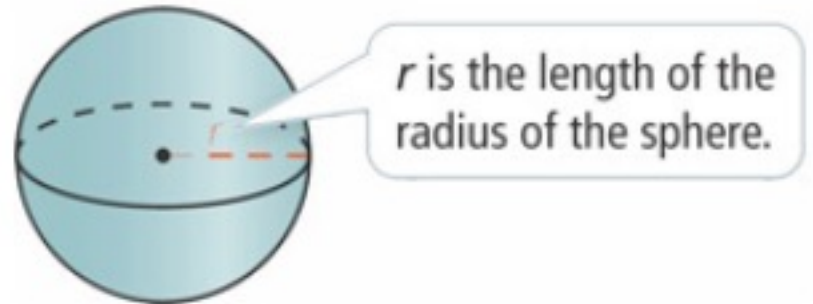
U6L6 – Introduction



A sphere is the set of all points in space equidistant from a given point called the **center**.

A **radius** is a segment that has one endpoint at the center and the other endpoint on the sphere.

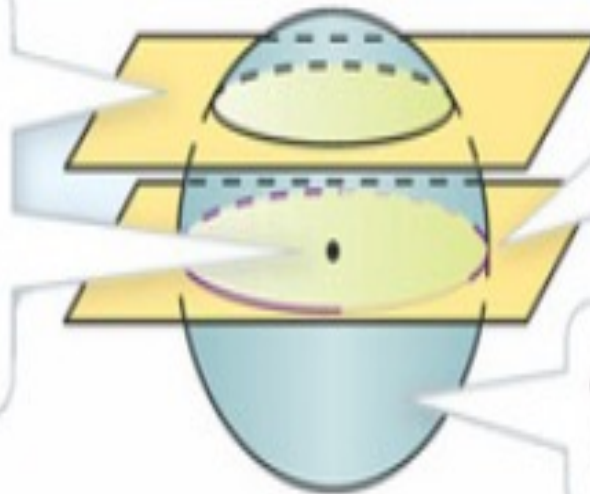
A **diameter** is a segment passing through the center with endpoints on the sphere.



U6L6 – Introduction



When a plane and a sphere intersect in more than one point, the intersection is a circle. If the center of the circle is also the center of the sphere, it is called a **great circle**.



The circumference of a great circle is the **circumference** of the sphere.

A great circle divides a sphere into two **hemispheres**.

U6L6 – Surface Area of a Sphere



The surface area of a sphere is 4 times the product of pi and the square of the radius of the sphere.

$$S. A. = 4\pi r^2$$



U6L6 – Surface Area of a Sphere



Find the surface area of the sphere with the given diameter or radius. Answer in terms of pi and to the nearest hundredth.

$$d = 32mm$$

$$A = 4\pi r^2$$

$$A = 4\pi(16)^2$$

$$A = 4\pi(256)$$

$$A = 1024\pi \text{ mm}^2$$

$$A = 3,215.36 \text{ mm}^2$$

U6L6 – Surface Area of a Sphere



Find the surface area of the sphere with the given diameter or radius. Answer in terms of pi and to the nearest hundredth.

$$r = 100 \text{ yd}$$

$$A = 4\pi r^2$$

$$A = 4\pi(100)^2$$

$$A = 4\pi(10,000)$$

$$A = 40,000\pi \text{ yd}^2$$

$$A = 125,600 \text{ yd}^2$$

U6L6 – Volume of a Sphere



The volume of a sphere is four-thirds the product of pi and the cube of the radius of the sphere.

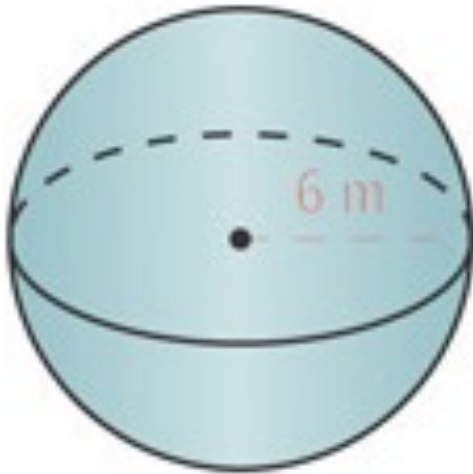
$$V = \frac{4}{3} \pi r^3$$



U6L6 – Volume of a Sphere



What is the volume of the sphere? Calculate in terms of pi and to the nearest hundredth.



$$V = \frac{4}{3}\pi r^3$$

$$V = \frac{4}{3}\pi(6)^3$$

$$V = \frac{4}{3}\pi(216)$$

$$V = 288\pi m^3$$

$$V = 904.32 m^3$$

U6L6 – Volume of a Sphere



The surface area of a sphere is $6400\pi \text{ in}^2$. What is the volume of the sphere to the nearest cubic inch?

$$S.A. = 4\pi r^2$$

$$6400\pi = 4\pi r^2$$

$$\frac{6400\pi}{4\pi} = \frac{4\pi r^2}{4\pi}$$

$$1600 = r^2$$

$$r = 40 \text{ in.}$$

$$V = \frac{4}{3}\pi(40)^3$$

$$V = \frac{4}{3}\pi(64,000)$$

$$V = \frac{256,000}{3}\pi$$

$$V = 85,333\pi$$

$$V = \mathbf{267,947 \text{ in}^3}$$

U6L6 – Surface Area of a Sphere



The volume of a sphere is 4200 ft^3 . What is its surface area to the nearest tenth?

$$V = \frac{4}{3}\pi r^3$$

$$4200 = \frac{4}{3}\pi r^3$$

$$\left(\frac{3}{4}\right)4200 = \frac{4}{3}\pi r^3 \left(\frac{3}{4}\right)$$

$$3150 = \pi r^3$$

$$\frac{3150}{\pi} = \frac{\pi r^3}{\pi}$$

$$1003.2 = r^3$$

$$10.01 = r$$

$$A = 4\pi r^2$$

$$A = 4\pi(10.01)^2$$

$$A = 4\pi(100.2)$$

$$A = \mathbf{1258.5 \text{ ft}^2}$$

U6L6 – Sphere Formulas



Spheres	
Surface Area	$SA = 4\pi r^2$
Volume	$V = \frac{4}{3}\pi r^3$

U6L6 – Summary of all formulas



Shape	Lateral Area	Surface Area	Volume
Prism	$LA = ph$	$SA = LA + 2B$	$V = Bh$
Cylinder	$LA = 2\pi rh$	$SA = 2\pi rh + 2\pi r^2$	$V = \pi r^2 h$
Pyramid	$LA = \frac{1}{2}pl$	$SA = LA + B$	$V = \frac{1}{3}Bh$
Cone	$LA = \pi rl$	$SA = LA + B$	$V = \frac{1}{3}\pi r^2 h$
Sphere	n/a	$SA = 4\pi r^2$	$V = \frac{4}{3}\pi r^3$

Questions?



- Check the Message Board first
- Send a WebMail
- You can also make an appointment at <https://elizondo.youcanbook.me>
- You can also call me at (559) 549-3244. If I'm not available to answer your call, please leave a voicemail with your full name and phone number.