

Why are Bubbles Spheres?

Lesson Plan

Cube Fellow: Eric Clark

Teacher Mentor: Sandra Fugett

Goal: Practice using surface area and volume formulas and determine why bubbles are spheres.

Grade and Course: 10th grade Geometry

KY Standards: MA-HS-2.1.1, MA-HS-M-S-MPA3

Objectives: The students should be comfortable finding the surface area of a cone, cylinder, rectangular prism, and sphere. They should also be able to find the measurements required for one of those objects to contain a particular volume.

Resources/materials needed: worksheet, bubbles (for effect!)

Description of Plan: The students will need to find the measurements needed for a cone, cylinder, rectangular prism, and sphere to contain 100cm^3 . They will then use these measurements to calculate the surface area of each. The lesson should end by noting that the sphere contains the volume using the least amount of surface area. NOTE: Be aware that students will try to find the measurements by guess-and-check techniques. Stress the importance of CHOOSING all but one measurement and SOLVING for the last.

Lesson Source: Eric Clark

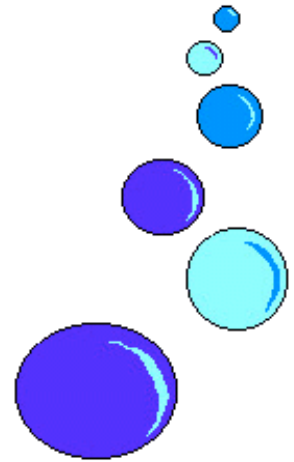
Instructional Mode: Individual work

Date Given: 04/01/08

Estimated Time: 1 day

Date Submitted to Algebra³: 04/01/08

Why are Bubbles Spheres?







Have you ever wondered why bubbles are spheres? Why not rectangular prisms, cones, or cylinders? We will answer this question today by looking at surface area and volume.

In the following table, there are four figures. Your first task is to find the measurements needed for the given shape to have a volume of 100cm^3 . For example, to make the volume of a rectangular prism 100cm^3 , we could let length be 1cm, width be 1cm, and height be 100cm. That way,

$$\begin{aligned}V &= LWH \\ &= 1 * 1 * 100 \\ &= 100\text{cm}^3\end{aligned}$$

(By the way, you will have to find measurements other than $L=1$, $W=1$, $H=100$ now!) Make sure you round all of your answers to 2 digits after the decimal point.

After doing this, use these measurements to find the surface area of the shapes. Be careful with the cone. You will first need to find L , which is the slant height!

Shape	Measurements to make $V = 100\text{cm}^3$	Surface Area
 cylinder	R= H=	
 cone	R= H= L=	
 rectangular prism	L= W= H=	
 sphere	R=	

After looking at this data, why do you think bubbles are spheres?