

# Daily Routine

- Sit in your appropriate seat quietly
- Have all necessary materials out
- All back packs on the floor
- All cell phones on silent and away in backpacks
- All music devices off and headphones out of your ears
- No food or drink except for water

# Bell Work

- What is Earth Science? Be specific....
- What is one goal you have for this semester?

# Earth Science Announcements

Syllabus Signature Sheet

Lab Safety Contract

# Lab Safety

# Mapping the Classroom

- Take out your assumption sheet from yesterday
- Take about five minutes to map out the classroom (don't have to be artistic)
- Mr. Hamilton will then go over where all the safety Equipment is in the classroom. He will also explain what the items are used for in the lab
- Include these items in your map.

# Lab Safety Video

- <https://www.youtube.com/watch?v=VRWRmlEHR3A>

# Lab Safety Quiz

- Work on the quiz individual for 10-15 minutes
- When instructed, talk to the person next you and compare answers (5-10 minutes)
- When instructed, break up into groups of 4 (maybe a few groups of 3)

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# Bell Work

- What should you do if you accidentally break a piece of glassware?
- What do you think density is?

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# Mass, Volume, and Density

# **Unit: Metrics and Density**

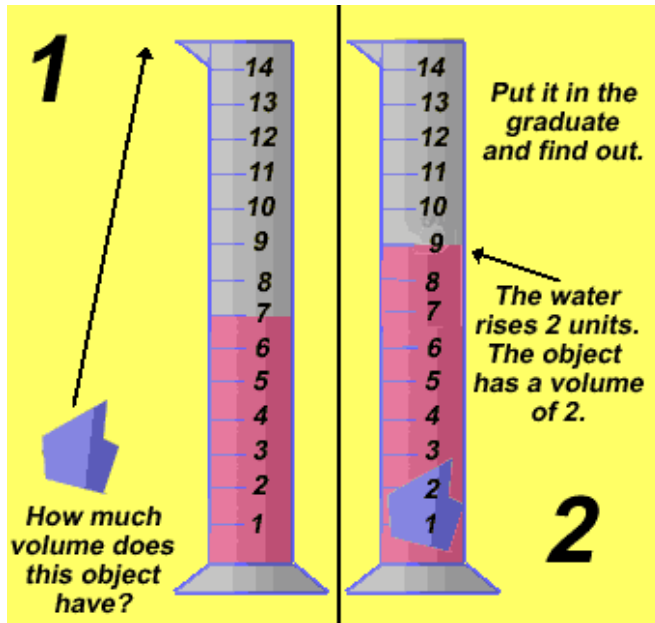
## **Topic: Density**

### **Objectives:**

- I will learn how to calculate volume by water displacement
- I will understand the concept of density given mass and volume

# What is Volume?

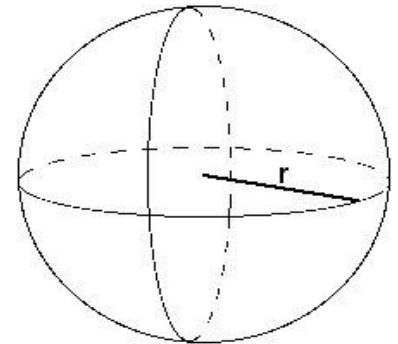
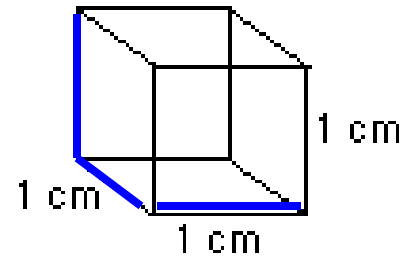
- We use Volume when we want to find the capacity or the space of something (how much liquid is inside)
- Volume is measured in liters or milliliters



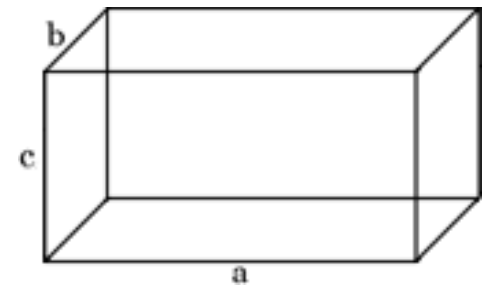
# What are the 2 ways we find volume?

- For simple shapes, like cubes and spheres, we can calculate them through basic math
- For example, to find the volume of a cube we measure the (Length x Width x Height)

Volume of 1 cubic  
(cm<sup>3</sup>) centimeter

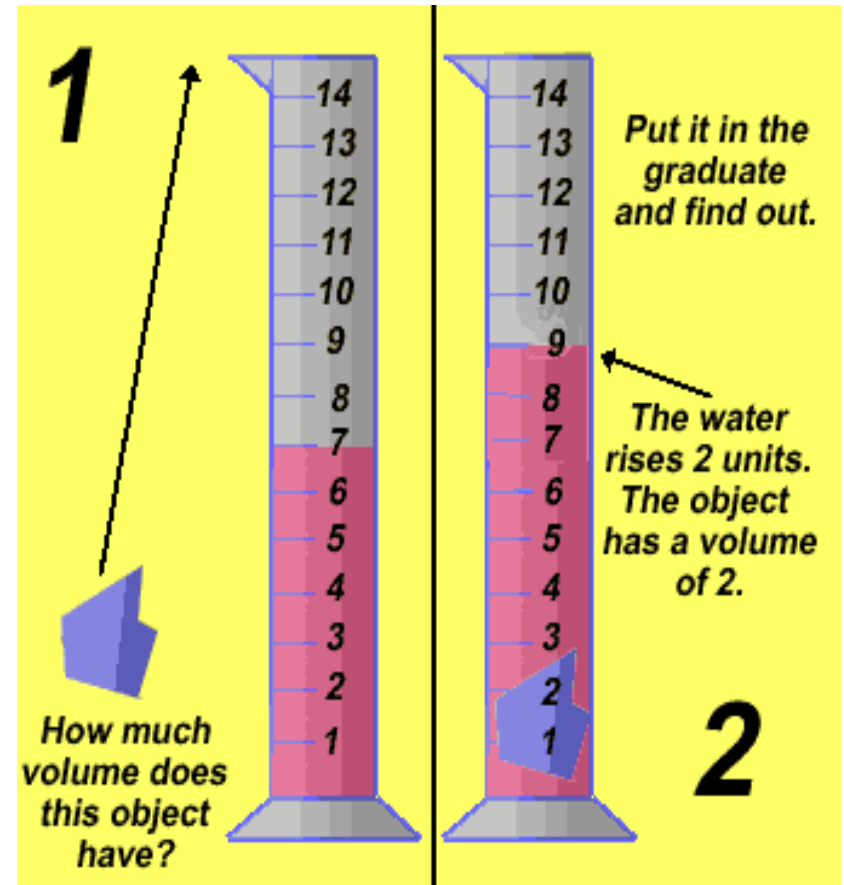


$$\text{Volume} = \frac{4}{3}\pi r^3$$



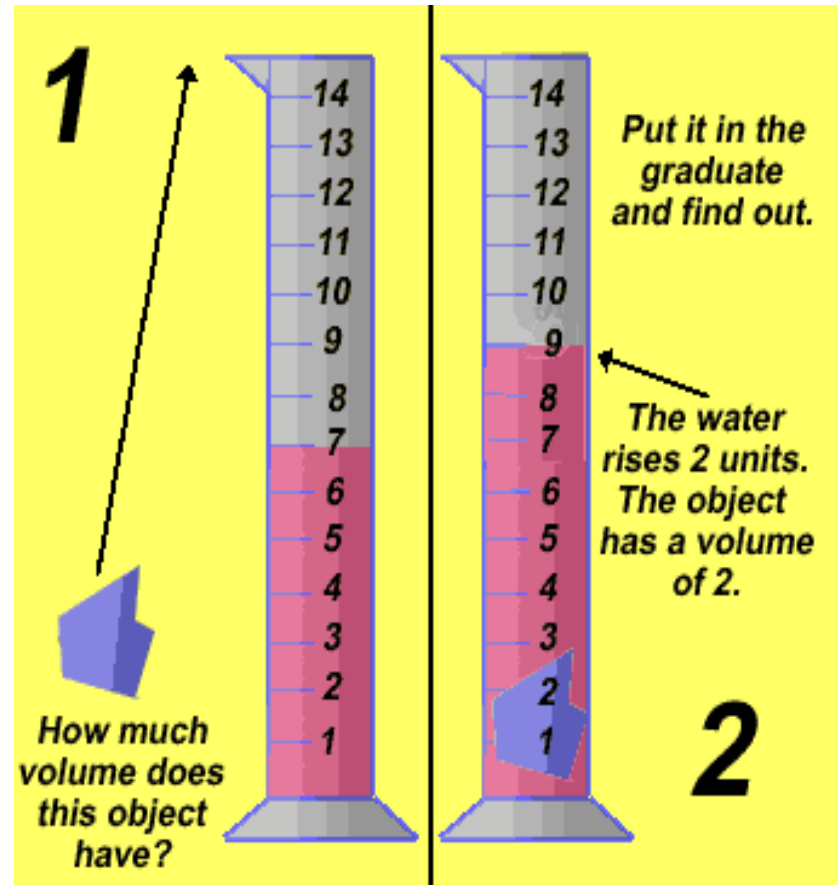
# 2 ways we find volume:

- If something has an irregular shape, how do we find the volume of it?
- The other way we find volume is by displacement



# What is Volume by Displacement?

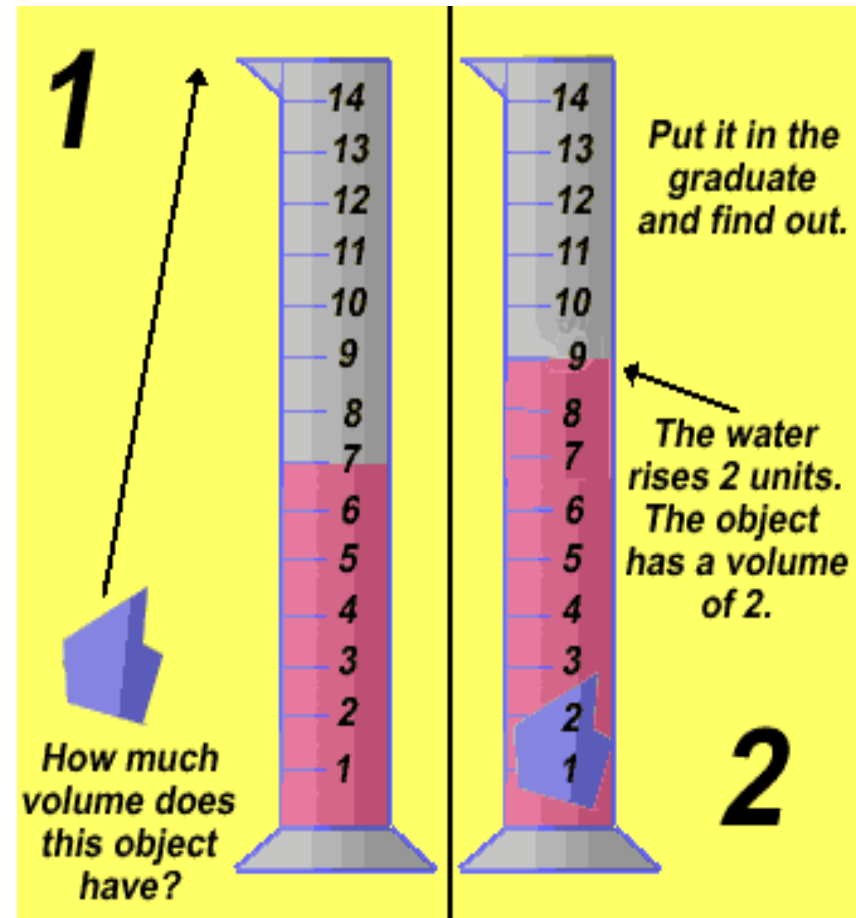
- Let's say we want to find the volume of a rock
- You can't exactly take out a ruler and measure it like you could a cube or triangle





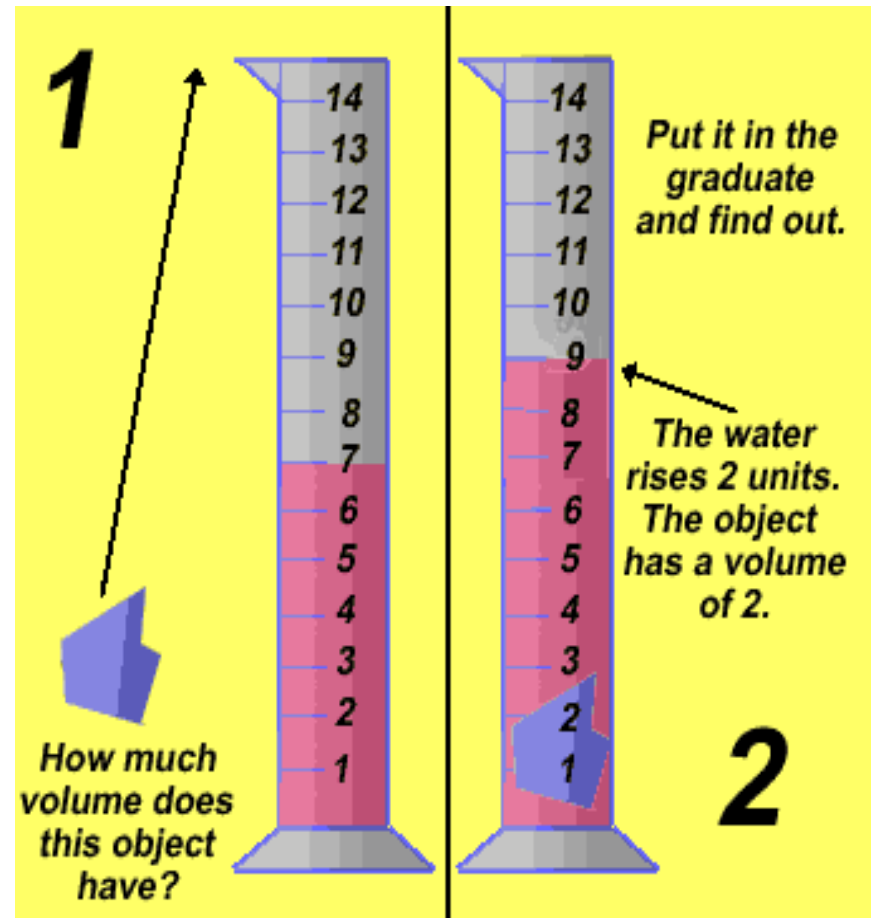
# What is Volume by Displacement?

- **Here's how you do it:**
- You drop the rock into water
- Obviously, the water level will rise
- But, by how much?
- The amount it rises equals the volume of the rock



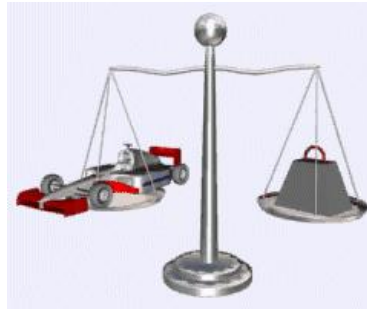
# What is Volume by Displacement?

- Submerging the object will cause the water level to rise
- The amount it rises, equals the volume of the rock in milliliters
- Volume of water and rock – volume of water = volume of rock



# Practice measuring volume

# What is Mass?



- When we mass something, we measure how much stuff (or matter) the object is made of
- We find mass by weighing the object
- Mass is measured in grams and kilograms

# What is Density

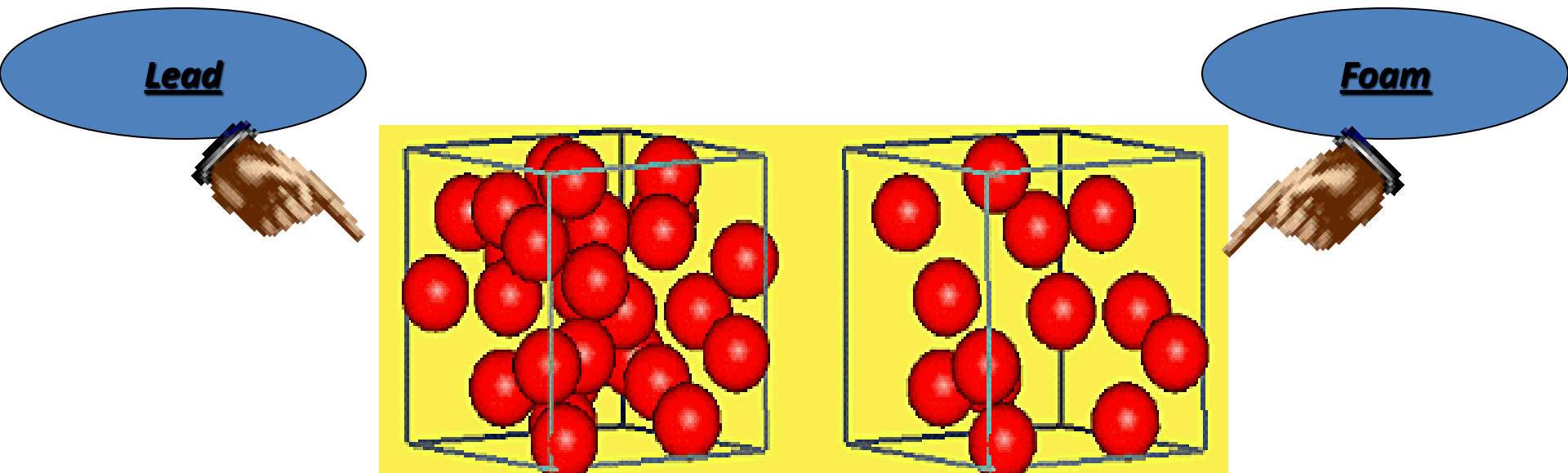
- **Density** measures how much stuff (matter/mass) is compacted into a certain space (volume)
- **Density** compares the **mass** of an object to its **volume**.
- In the density expression, the **mass** of an object or substance is written in the **numerator** and its **volume** in the **denominator**.

$$D = \frac{\text{mass}}{\text{volume}} = \frac{\text{g}}{\text{mL}} \text{ or } \frac{\text{g}}{\text{cm}^3} = \text{g/cm}^3$$

- *Note: 1 mL = 1 cm<sup>3</sup>*

# Density

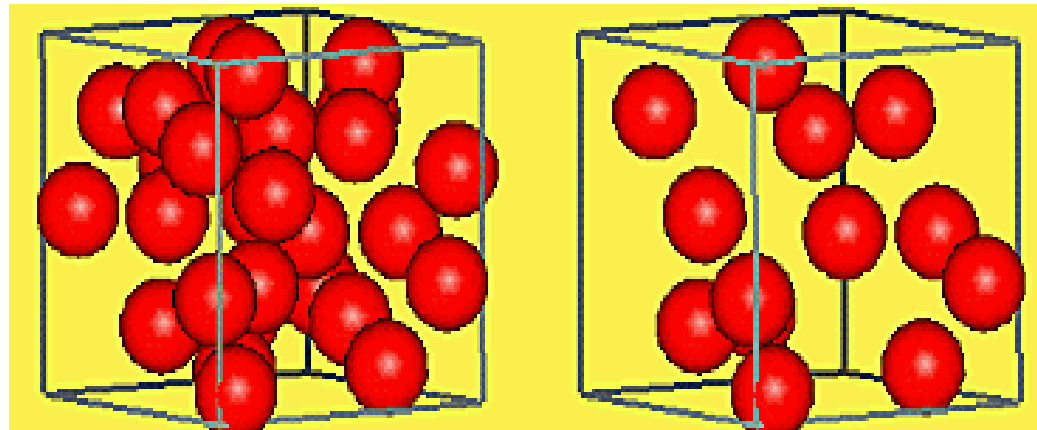
- Lets imagine we have 2 cubes the same size
- However, now let us imagine that one cube is made of lead, and the other is made of Foam
- They both have the same size but which one is more dense?



# Density

- The lead Cube is!
- But why?
- Well, it all has to do with how much stuff is packed into the same amount of space!

Lead

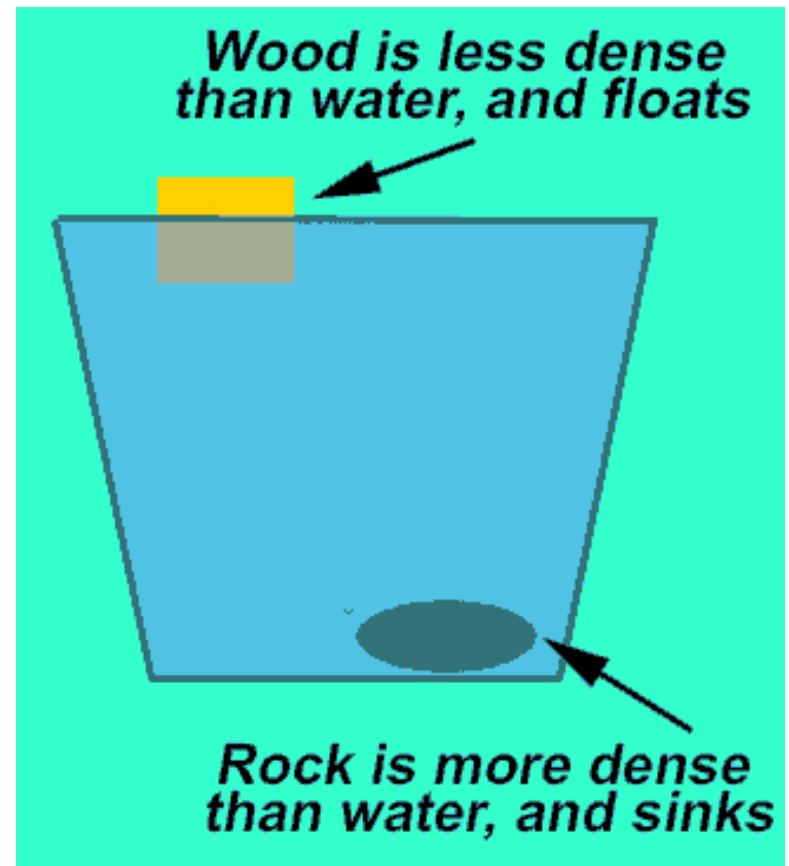


Foam



# Water and Density

- Water has a density of 1
- If an object sinks, it has a density greater than 1
- If an object floats, it has a density less than 1





# Gummy Bear Lab

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# Bell Work

- Define density.
- What is the equation to solve for density?
- Explain how to figure out the volume of an irregular object.

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Back to School Night: Monday 1/12/15

# Mass, Volume, and Density