

DENSITY OF WATER

Objective:

To be able to measure the volume and mass of water and calculate its density.

Demonstration: Water Has Density

In previous lessons, you found the density of solids by measuring their mass and volume. Do you think a liquid like water can have density?

How do you think you can find the density of a liquid like water?

Could both the small and large amounts of water your classmate lifted have the same density?

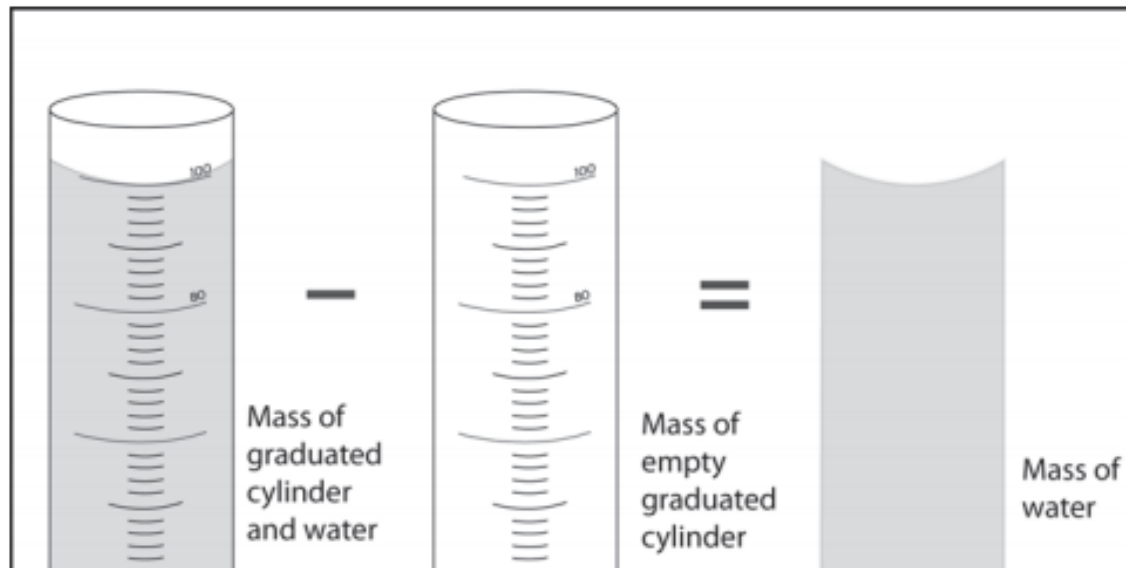
Finding the Density of Water:

What two things do you need to know in order to find the density of water?

How can you measure a volume of water?

How can you measure the mass of water?

Measuring the mass of water



Activity

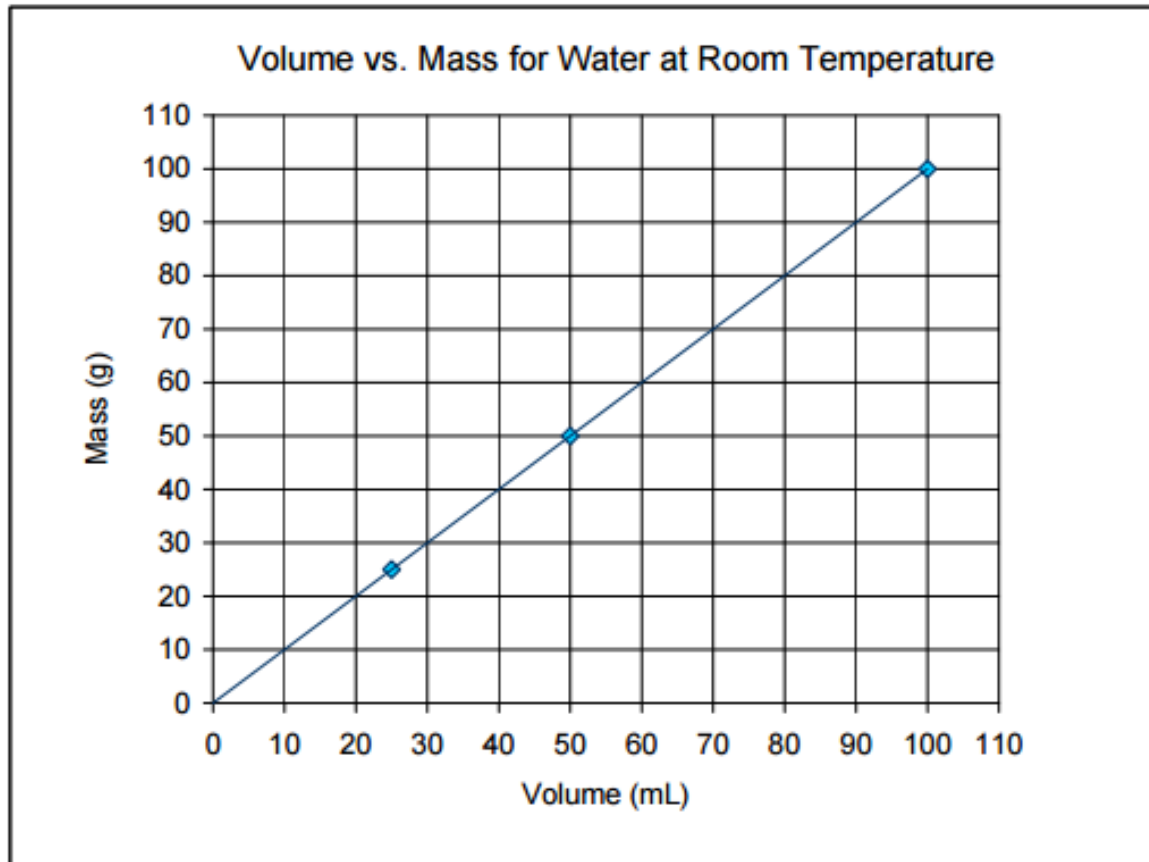
You will be finding the mass of different volumes of water.

Follow all directions on your activity sheet.

(15 minutes)

Finding the density of different volumes of water			
Volume of water	100 milliliters	50 milliliters	25 milliliters
Mass of graduated cylinder + water (g)			
Mass of empty graduated cylinder (g)			
Mass of water (g)			
Density of water (g/cm ³)			

Graph your results:



Your results should look similar to this!

Use your graph to answer the questions on your lab activity sheet.

EXPLAIN IT WITH ATOMS AND MOLECULES

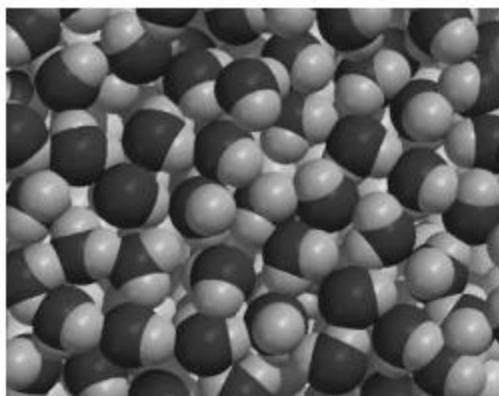
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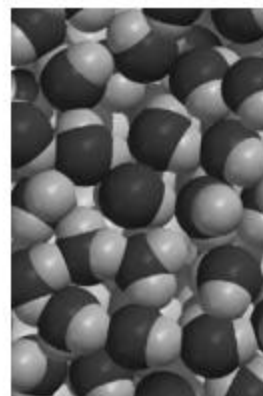
Each individual molecule has the same size and mass. The water molecules are packed very close together the same way throughout an entire sample of water.

Sample B is half the volume of Sample A.

Do the samples have the same mass?



Sample A



Sample B

Do the samples have the same density?

Key Concepts:

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- Just like solids, liquids have their own characteristic **density**.
- The volume of a liquid can be measured directly with a **graduated cylinder**.
- The molecules of different liquids have different **size** and **mass**.
- The mass and size of the molecules in a liquid and **how closely they are packed together** determine the density of the liquid.
- Just like a liquid, the density of a liquid equals the **mass** of the liquid divided by its **volume**; $D = m/v$
- The density of water is **1 gram per cubic centimeter (1 g/cm³ or 1 g/mL)**
- The density of a substance is **the same regardless of the size of the sample**.