

Pre-AP Chemistry/AP Chemistry/Chemistry
Unit #2—Measurement

Density and Water Displacement

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Suppose a student finds that 23.50 mL of liquid weighs 35.062 g. What is the density of the liquid?

$$\frac{35.062 \text{ g}}{23.50 \text{ mL}} = 1.492 \text{ g/mL}$$

Mercury has a density of 13.6 g/mL. What volume of mercury must be taken to obtain 226 g of the metal?

$$\frac{226 \text{ g}}{13.6 \text{ g/mL}} = 16.618 \text{ mL}$$

You have a 23.0 milliliter sample of ethanol with a density of 0.7893 g/mL. What volume of ethanol do you have?

$$(23.0 \text{ mL}) (0.7893 \text{ g/mL}) = 18.154 \text{ g}$$

A student takes a medallion and finds its mass to be 95 g. She takes a graduated cylinder and adds 80.0 mL of water. She places the medallion into the water and records the volume of the water at 95 mL. What is the density of the medallion?

$$\frac{95 \text{ g}}{(95 \text{ mL} - 80 \text{ mL})} = 6.333 \text{ g/mL}$$

A student takes a piece of metal with a density of 2.234 g/mL and places it into 35 mL of water. It has a mass of 25 grams. How much water is displaced when the piece of metal is added into the water?

$$\frac{25 \text{ g}}{2.234 \text{ g/mL}} = 11.191 \text{ mL} = \Delta v$$