

Density is mass per volume

density units are:

$$d = \text{g/mL}$$

$$d = \text{g/cm}^3$$

$$d = \text{g/cc (not typical vol. unit)}$$

Density equation can be rearranged to solve for any variable:

$$\text{Density} = \text{mass/volume} \quad d = m/v$$

$$\text{Mass} = \text{density} * \text{volume} \quad m = d \cdot v$$

$$\text{Volume} = \text{mass/density} \quad v = m/d$$

1. To calculate density if mass and volume are given, use this equation: $d = m/v$
Sample of lead metal weighs 10.57 g and has a volume of 0.931 cm³

$$d = 10.57/0.931 = 11.35 \text{ g/cm}^3$$

2. Density by water displacement:

Calculate the density of silicon that weighs 8.763 g and is placed in grad. cylinder that contains 25.00 ml of water; the final water level is 28.76 mL

$$\text{Mass} = 8.763\text{g} \quad \text{Volume} = 28.76 - 25.00 = 3.76 \text{ mL}$$

$$d = 8.763\text{g}/3.76 \text{ mL} = 2.3305 = 2.331 \text{ g/cm}^3 = 2.331 \text{ g/mL}$$

3. To determine mass using density, use this equation: $m = d \cdot v$

Calculate mass (in kg) of 1 qt of milk; density = 1.03 g/mL

1 qt = 946 mL [you need this relationship]

$$m = v/d = 946 \text{ mL} / 1.03 \text{ g/mL} = 918.446 \text{ g} = 0.918 \text{ kg}$$

4. To determine volume using density, use this equation: $v = m/d$

Calculate volume of 20.0 g of sucrose; density = 1.56g/cc

$$v = m/d = 20.0\text{g} / 1.56 \text{ g/cc} = 12.8 \text{ cc} \text{ pay attention to units!}$$