

Science 9 Properties of Matter - Review

Name: KEY

Block: _____

**** For questions which involve calculations, show all work, including the equation you used (full marks will NOT be given for showing only the final answer) ****

Given information: density = mass/volume

$$D = m/V$$

$$D = \frac{m}{V}$$

$$m = D \times V$$

$$V = \frac{m}{D}$$

1. State whether each of the following is matter or energy.
 - a. pencil matter
 - b. blue paint matter
 - c. sunlight energy
 - d. the sound of a train energy
 - e. oxygen matter

2. What is matter? (give the two defining characteristics)

Matter has mass and volume

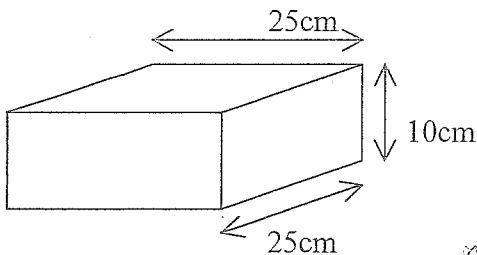
3. A 5000.0 mL container has a mass of 10 000g. What is the density of the container?

$$d = \frac{m}{V} = \frac{10000g}{5000mL} = \boxed{2.0g/mL}$$

4. A block of copper has a mass of 4000g. The block has a volume of 446.9mL. What is the density of copper?

$$d = \frac{m}{V} = \frac{4000g}{446.9mL} = \boxed{8.95g/mL}$$

5. Silver has a density of 10.5 g/mL. What is the mass of a block of silver that measures 25cm by 25 cm by 10 cm?



$$\begin{aligned} \text{Volume} &= l \times w \times h \\ &= (25cm)(25cm)(10cm) \\ V &= 6250cm^3 \end{aligned}$$

$$\begin{aligned} m &= d \times V \\ &= (10.5g/mL)(6250cm^3) \end{aligned}$$

$1mL = 1cm^3$

$$\begin{aligned} m &= 65625g \\ m &= 65.625kg \end{aligned}$$

6. The following materials are all dumped into the same container:

Material	Density
Methanol	0.79 g/mL
Mercury	13.6 g/mL
Iodine	7.86 g/mL
Bromine	3.12 g/mL
Lead	11.34 g/mL

Methanol
Bromine
Iodine
Lead
Mercury

In the space provided to the right, list the names of the material in the order that they would settle in the container.

7. A particular rock has mass of 350g. It was placed in a graduated cylinder that had 90.0 mL of water in it and the water in the cylinder rose to 125 mL. What is the density of the rock?

$$\text{Volume} = 125 \text{ mL} - 90 \text{ mL} = 35 \text{ mL}$$

$$d = \frac{m}{V} = \frac{350 \text{ g}}{35 \text{ mL}} = 10 \text{ g/mL}$$

8. What is the volume of a 40.0g lump of gold? (density of gold is 19.3 g/mL)

$$V = \frac{m}{D} = \frac{40.0 \text{ g}}{19.3 \text{ g/mL}} = 2.1 \text{ mL}$$

9. A scientist found a bottle of clear liquid in her lab, but the label had fallen off the bottle. She made a number of measurements to try to determine the identity of the liquid. Use the data below, and the table of densities given, to determine the identity of the liquid.

Volume of liquid

Mass of dry 10 mL graduated cylinder

Mass of graduated cylinder with 10mL of the unknown liquid

$$V = 10.0 \text{ mL}$$

$$= 11.5 \text{ g}$$

$$= 24.1 \text{ g}$$

Table of densities of some colourless liquids:

Liquid	density
Ethanol	0.70 g/mL
Glycerine	1.26 g/mL
Hydrogen peroxide	1.45 g/mL
Methanol	0.79 g/mL
Propanol	0.79 g/mL
Water	1.00 g/mL

$$\text{mass} = 24.1 \text{ g} - 11.5 \text{ g}$$

$$m = 12.6 \text{ g}$$

$$\text{density} = \frac{m}{V} = \frac{12.6 \text{ g}}{10.0 \text{ mL}}$$

$$d = 1.26 \text{ g/mL}$$

∴ the liquid is Glycerine