



Density

Comparing densities

1 Dembe has three small logs of different wood.

a) What must he do to compare their densities? _____

b) Which formula should he use to calculate the density of each wood?

Tick (✓) the correct box.

density = mass \times volume

density = volume/mass

density = mass/volume

2 Jaya has a block of material and wants to find its volume.

a) How should she do this? _____

b) Jaya's block is a cube with sides of 5 cm. What is its volume? Show your working.

3 a) Shazad wants to find the density of a pebble. Here are the stages he should use but they are in the wrong order. Arrange them correctly by writing the letter of each statement in the order in which it occurs. The first statement has been placed for you.

- A Put pebble on a balance.
- B Attach a string to the pebble.
- C Half fill a measuring cylinder with water.
- D Read the volume of water and pebble. (V2)
- E Carefully lower the pebble into the measuring cylinder.
- F Make sure that the pebble is completely covered by water.
- G Read off mass of pebble. (M)
- H Read the first level of water. (V1)

A _____

b) How should Shazad find the volume of the pebble? _____

c) Shazad's pebble has a mass of 90 g and a volume of 30 cm³. What is its density? Show your working.

4 Fozia wants to find the density of honey.

a) Here are the stages she should use but they are in the wrong order. Arrange them correctly by writing the letter of each statement in the order in which it occurs.

- A Read the mass of the measuring cylinder. (M1)
- B Read the mass of the cylinder and liquid. (M2)
- C Read the volume of liquid in the measuring cylinder. (V)
- D Put the measuring cylinder on the balance.
- E Place the cylinder containing the liquid on the balance.
- F Pour the liquid into the measuring cylinder.

- b) Which formula should Fozia use to calculate the density of the honey?
Tick (✓) the correct box.

Density = $M1 - M2/V$

Density = $M2 - M1/V$

Density = $M1 + M2/V$

Density = $V - M1/M2$

- c) Fozia's results are A 100 g, B 120 g and V 14 cm³. What is the density of the honey? Show your working.

Floating and sinking

- 5 Budi has three liquids: water, vegetable oil and maple syrup. He says the water has a density of 1, the vegetable oil has a density of 0.92 and the maple syrup has a density of 1.37.

- a) What are the units he is using to measure the density?

- b) What would the units be if he multiplied them by a thousand?

Budi pours each one into the same tall jar. They settle out in layers.

- c) (i) Which liquid is at the top? _____

(ii) Which liquid is in the middle? _____

(iii) Which liquid is at the bottom? _____

(iv) Explain your answer. _____



- d) Budi pours some corn oil into the jar. He says it has a density of 0.97. Where does it settle? Tick (✓) the two correct boxes.

Above the water

Below the vegetable oil

Above the maple syrup

Below the maple syrup

Density of gases

- 6 A teacher is demonstrating how to find the density of air.
a) Here are the stages she uses but they are in the wrong order. Arrange them correctly by writing the letter of each statement in the order in which it occurs.

A Put the evacuated flask on the balance.

B Pour water from the flask into a measuring cylinder.

C Find the mass of the flask. (M1)

D Open the flask underwater.

E Measure the volume of the water. (V)

F Place the flask on the balance.

G Let the water replace the vacuum in the flask.

H Measure the mass of the evacuated flask. (M2)

I Remove air from the flask with a vacuum pump.

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- b) Which formula should the teacher use to calculate the density of the gas?
Tick (✓) the correct box.

Density = $M1 - M2/V$

Density = $M2 - M1/V$

Density = $M2 - V/M1$

Density = $M1 - V/M2$

- 7 a) The particles of a gas move further apart when they are heated. How does this affect the density of the gas? _____
- b) The particles of a gas are pushed closer together when the pressure on the gas is increased. How does this affect the density? _____

- c) If the densities of two gases are measured at the standard temperature and pressure (STP), what does it mean? _____

Teacher comments