Density Practice

1   Is each sentence sometimes true, always true, or always false?
    (a) Gold is denser than water.   (c) Air is denser than water.

    (b) Gold is heavier than water.   (d) Helium is heavier than air.

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2   Complete the sentences filling in the blanks.
    Use the words **density**, **mass**, **larger**, **smaller**, **sink**, **float**, **metre**, **centimetre**, **volume**.
    Not all words are used.
    A cubic _____ of water is heavier than a cubic _____ of silver.
    This is because it has more _____.
    If we want to compare fairly, we take some water and silver of the same _____.
    The silver will then be heavier, as its _____ (in g/cm^3) is larger.
    This means that a silver lump will _____ in water.

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3   Here is a list of materials. Number them in order of density. Put 1 against the least dense
    material, and 5 against the most dense.
    (a) air   (b) ice   (c) water   (d) gold   (e) iron

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4   In the table, match each quantity to its unit and symbol.
    Choose from the symbols m, V and ρ.
    Choose from the units g, cm^3 and g/cm^3.

Quantity	Symbol	Unit
Volume		
Mass		
Density		

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5   Complete the word equations using **Density**, **Mass** and **Volume**.
    (a) Mass =   (b) Volume =   (c) Density

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6   Rewrite your word equations using symbols.
   (a) $V =$ (b) $\rho =$ (c) $m =$

7   Use your understanding of density, or the formulae, to calculate

(a) The density of osmium (a metal) if 1100 g has a volume of 50 cm^3.

(b) The mass of 200 cm^3 of brass $\left(\text{density} = 8.7 \text{ g/cm}^3\right)$.

(c) The volume of 60 g of packing polystyrene $\left(\rho = 0.03 \text{ g/cm}^3\right)$.

(d) The mass of 1000 cm^3 of chocolate $\left(\text{density} = 1.3 \text{ g/cm}^3\right)$.

(e) The volume of 2 kg of petrol $\left(\rho = 0.75 \text{ g/cm}^3, 1 \text{ kg} = 1000 \text{ g}\right)$.

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8   A 45 g block of ice has a volume of 50 cm^3.
(a) Calculate the density of ice in g/cm^3.

(b) Water has a density of 1.0 g/cm^3. Do you think an ice cube will float in water? Why?

(c) Will all masses of ice float in water, or only small ones?

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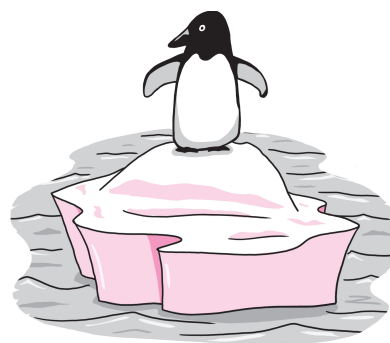
9   In this question, we will work out the mass of the water in a swimming pool.

(a) A cubic metre of water measures 100 cm $\times$ 100 cm $\times$ 100 cm.
Calculate the volume of a cubic metre in cm^3.

(b) Calculate the mass of a cubic metre of water in grams. The density is 1.0 g/cm^3.

(c) Write the mass of a cubic metre of water in kilograms. $(1 \text{ kg} = 1000 \text{ g})$

(d) A swimming pool measures 50 m $\times$ 10 m and the water is 1.25 m deep.
Calculate the volume of water in the pool in cubic metres.

(e) Multiply your answers to parts (c) and (d) to get the mass of the water in the pool in kilograms.