

Goal • Use this page to compare the densities of different substances.

What to Do

Use the information in the table to answer the following questions.

| Fluid | Density (g/mL) | Solid | Density (g/cm ³) |
|----------------|----------------|-------------------------|------------------------------|
| hydrogen | 0.000 09 | Styrofoam TM | 0.005 |
| helium | 0.0002 | cork | 0.24 |
| air | 0.0013 | oak | 0.70 |
| oxygen | 0.0014 | sugar | 1.59 |
| carbon dioxide | 0.002 | salt | 2.16 |
| ethyl alcohol | 0.79 | aluminum | 2.70 |
| machine oil | 0.90 | iron | 7.87 |
| water | 1.00 | nickel | 8.90 |
| seawater | 1.03 | copper | 8.92 |
| glycerol | 1.26 | lead | 11.34 |
| mercury | 13.55 | gold | 19.32 |

1. You drop three things into a glass of water: a piece of StyrofoamTM, a piece of oak, and a gold ring.

(a) Which will float?

(b) Which will sink?

2. Which is denser:

(a) carbon dioxide or air?

(b) oxygen or air?

(c) hydrogen or air?

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DATE:

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continued

3. You find a white granular substance in a jar in your cupboard. You suspect that it may be either sugar or salt. How could you find out without tasting the substance?

4. Why is it easier to swim in seawater than it is to swim in fresh water?

5. A student comes to the conclusion that solids are denser than liquids. Is this true? Explain.

Goal • Use this page to calculate the mass and volume of different substances.

What to Do

Use the table and the following formula to solve the following problems.

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

| Fluid | Density (g/mL) | Solid | Density (g/cm ³) |
|----------------|----------------|------------|------------------------------|
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1. Calculate the mass of 550 mL of air.

2. Calculate the mass of 50 cm³ of copper.

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3. What is the volume of a 2 g piece of gold?

4. How much space would 1 kg of air occupy?

5. In an experiment, two students find that 500 g of water occupies a space of 50 mL. Is this accurate? Explain.

6. In the same class, two students find that a piece of wood with a mass of 70 g has a volume of 103 cm³. They conclude that the wood is oak. Is this accurate? Explain.
