

**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 <sup>3</sup> )
hydrogen	0.000 09	Styrofoam™	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 Styrofoam™, a piece of oak, and a gold ring.

(a) Which will float?

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(b) Which will sink?

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2. Which is denser:

(a) carbon dioxide or air?

(b) oxygen or air?

(c) hydrogen or air?

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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?

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

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

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**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 <sup>3</sup> )
hydrogen	0.000 09	Styrofoam™	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
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mercury	13.55	gold	19.32

1. Calculate the mass of 550 mL of air.

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2. Calculate the mass of 50 cm<sup>3</sup> of copper.

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

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

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

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6. In the same class, two students find that a piece of wood with a mass of 70 g has a volume of 103 cm<sup>3</sup>. They conclude that the wood is oak. Is this accurate? Explain.

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