

DISCOVERING DENSITY #1

What do you know about density? *Take 2 minutes to collect some information about density. In your own words, explain to your partner what density is.*

P.O.E. - Soda Style

<p>a) A can of regular coke is dropped into water.</p> <p>Prediction : _____</p> <p>Observation: _____</p> <p>Explanation (Why did this happen)?</p> <p>_____</p> <p>_____</p>	<p>b) A can of diet coke is dropped into water.</p> <p>Prediction: _____</p> <p>Observation: _____</p> <p>Explanation (Why did this happen)?</p> <p>_____</p> <p>_____</p>
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DENSITY: the _____ per unit of _____.

- Mass of can of Coke = _____ Mass of can of Diet Coke = _____
- The regular Coke has more _____ for the _____ volume, so the density of the regular Coke is _____.

Density describes how _____ the particles are in a material.



*In the diagram to the left, describe the **spacing** of the particles in the solid block, the liquid, and in the gas.*

Solid: _____

Liquid: _____

Gas: _____

.....Most substances are more dense in their _____ form than in their liquid form.

→ Knowing this, how do you think temperature and density are related?

→ Can you think of an exception? _____

P.O.E. WACKY WATER

a) Oil is combined with water.

Prediction : _____

Observation: _____

Explanation (Why did this happen)?

b) Salt water is combined with fresh water.

Prediction: _____

Observation: _____

Explanation (Why did this happen)?

Fluids that do not mix will form layers based on density!

→ Fluids with a _____ density "float" on top of fluids with a _____ density

→ If a fluid has a density less than water (1.00 g/cm^3), it will _____

Calculating Density:

Sample Problems

1. The mass of a rock is 75g and its volume is 3cm^3 . Determine the density of the rock.

Step 1: List known and unknown quantities.

m =

V =

D =

Step 2: Use a proportion or algebra to solve for the missing variable

Step 3: Make a final written statement (including correct units) that answers the question.

Density = _____

DENSITY

Name _____

Which has the greater mass, air or lead? Most of you would answer lead, but actually this question does not have an answer. To compare these two things you need to know how much of each you have. A large amount of air could have a greater mass than a small amount of lead. To compare different things, we have to compare the masses of each that occupy the same space, or volume. This is called density.

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

Solve the following problems.

1. What is the density of carbon dioxide gas if 0.196 g occupies a volume of 100 mL?

Answer: _____

2. A block of wood 3.0 cm on each side has a mass of 27 g. What is the density of this block?

Answer: _____

3. An irregularly shaped stone was lowered into a graduated cylinder holding a volume of water equal to 2.0 mL. The height of the water rose to 7.0 mL. If the mass of the stone was 25 g, what was its density?

Answer: _____

4. A 10.0 cm³ sample of copper has a mass of 89.6 g. What is the density of copper?

Answer: _____

5. Silver has a density of 10.5 g/cm³ and gold has a density of 19.3 g/cm³. Which would have a greater mass, 5 cm³ of silver or 5 cm³ of gold?

Answer: _____

6. Five mL of ethanol has a mass of 3.9 g, and 5.0 mL of benzene has a mass of 4.4 g. Which liquid is denser?

Answer: _____

7. A sample of iron has the dimensions of 2 cm x 3 cm x 2 cm. If the mass of this rectangular-shaped object is 94 g, what is the density of iron?

Answer: _____