

1-5

Density Worksheet

block _____ name _____

The concept of density is sometimes confusing since it has to do with particles that we cannot see (atoms and molecules). If a substance is dense, that means that the atoms/molecules are close together.

Example: The dots below represent atoms.

In the first example we have 9 dots – 1 dot per square. There is a lot of space in between the dots (atoms). Look at the square labeled “A”. There is only 1 dot in the square.

Example 1

•	•	•
•	•	•
•	•	•

← **A**
one dot (atom) in square A

In the second example we take the same 9 dots, but we put them all in one square. Now there is not a lot of space between the dots (atoms). Look at the square labeled “A”. Now there are 9 dots in the square.

Example 2

		•••••

← **A**
nine dots (atoms) in square A

1. How many **total** dots are in example 1? _____ how many in example 2? _____
2. In which example are the dots (atoms) closer together? Example # _____
3. In which example do the dots take up more space (more volume)? # _____
4. Which example shows a greater density in square A? # _____

To calculate density we need to know how many dots (atoms) are in a substance **and** how much space the dots (atoms) take up.

5. Which choice below is a measure of **how many atoms/molecules** are in a substance (circle it)?

weight *mass* *volume*

6. Which choice below is a measure of **how much space** an object takes up (circle it)?

weight *mass* *volume*

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Since density shows how many particles (mass) are in a certain amount of space (volume), the formula for density is ...

Density = mass / volume (mass divided by volume)

The unit for density is grams per cubic centimeter (g/cm^3)

Calculate the densities of the following objects. You will need a calculator.

Round all answers to the tenths place (1 place after the decimal)

7. A shoe box

mass = 114.0 g volume = 538.5 cm^3

•density = _____ g/cm^3

8. a rock

mass = 22.3 g volume = 8.0 cm^3

• density = _____ g/cm^3

9. A full soda bottle

mass = 609.0 g volume = 591.0 mL

•density = _____ g/cm^3

10. a dry sponge

mass = 54.2 g volume = 78.1 cm^3

•density = _____ g/cm^3

11. When a dry sponge absorbs water, which changes **most** (circle one)?

A. the sponge's mass

B. neither changes, mass and volume stay the same

C. the sponge's volume

12. The sponge in question #10 absorbs 277 grams of water. Recalculate its density.

***show your work**

13. a) You drink all of the soda out of the bottle (from question #9). The soda had a mass of 570 grams. Recalculate the density of the empty soda bottle.

***show your work**

b) Why did the density of the bottle of soda change?