1-5 Density Worksheet

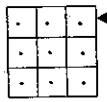
block name _____

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 fist 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.

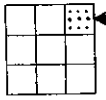
Example 1



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



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?

DATE: NAME: CLASS:

CHAPTER 7

Calculating Density Practice Problems

BLM 3-10

Goal Use these questions to check your understanding of how to calculate density.

What to Do Answer these questions after you have read page 265 of BC Science 8.

1. A student measures the mass of an 8 cm3 block of brown sugar to be 12.9 g. What is the density of the brown sugar?

1. _____

2. A chef fills a 50 mL container with 43.5 g of cooking oil. What is the density of the oil?

2. _____

3. A machine shop worker records the mass of an aluminum cube as 176 g. If one side of the cube measures 4 cm, what is the density of the aluminum?

3. _____

X Based on the density values on page 262 of BC Science 8, list how the following liquids would layer in a beaker from top to bottom: glycerol, ethyl alcohol, mercury, seawater, machine oil, water.

4. _____

5. A teacher performing a demonstration finds that a piece of cork displaces 23.5 mL of water. The piece of cork has a mass of 5.7 g. What is the density of the cork?

5. _____

6. A carver begins work on a block of granite that measures 20 cm by 10 cm by 5 cm. If the block of granite has a mass of 2700 g, what is the density of the granite?

6. _____

7. A piece of PVC plumbing pipe displaces 60 mL when placed into a container of water. If the pipe has a mass of 78 g, what is the density of PVC?

7. _____

8. A solid magnesium flare has a mass of 1300 g and a volume of 743 cm3. What is the density of the magnesium?

8. _____

9. An ice cube has a volume of 12 cm3, and a mass of 11 g. What is the density of the ice?

9. _____

10. Gold is one of the densest substances on Earth. A gold bar 20 cm by 5 cm by 5 cm has a mass of 9.7 kg. What is the density of gold? Express your answer in g/cm3.

10. _____