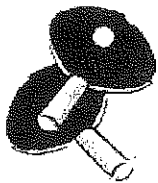


Name: _____
Period: _____

Density and Buoyancy

Density



Density is a measure of how tightly packed the atoms of a substance are.

A ping-pong ball and a golf ball are approximately the same size.

Which one is more dense? A: Golf Ball.



↳ more mass in the same amount of space

The density of an object could be increased in two ways:

- 1) if you cram more matter into a particular volume of space (increase mass) or
- 2) cram the matter you have into a smaller volume of space (decrease volume—which you could do with a gas).

Density: $D = \frac{m}{v}$

in g/mL or g/cm³

Mass in grams (g)

Volume in cm³ or mL

What does this equation say in plain English?

Density equals mass divided by vol.

Ex. An 20 gram object has a volume of 5 cm³. Find its density.

$$D = \frac{m}{v} = \frac{20g}{5cm^3} = 4g/cm^3$$

Practice:

Find the density of an 45 gram object that's volume is 15 mL.

$$D = \frac{m}{v} = \frac{45g}{15mL} = 3g/mL$$

If a 10 mL object weighs 22 grams, what is its density?

$$D = \frac{m}{v} = \frac{22g}{10mL} = 2.2g/mL$$

Water = 1g/mL

sink in water

Density of States of Matter

You already know about the three most common states of matter. How does the density of a substance change when it changes temperature or changes its state of matter?

Which is more dense a liquid or a solid?

Solid

Which is more dense a liquid or a gas?

Liquid

We learned that the molecules in a solids are closer together. This is why solids are more dense.

Liquids slide around and are less closely packed. Liquids are less dense than solids.

Not all solids are denser than liquids. There is one great and important exception.



What is it?

Water (H₂O)
Ice (solid) is less dense than Water (Liquid)

