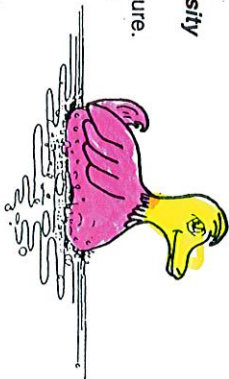


Density

Density is a physical property of matter. *Density* is defined as the mass per unit volume of a substance at a particular temperature and pressure. Density is usually expressed in grams per cubic centimeter (g/cm³).



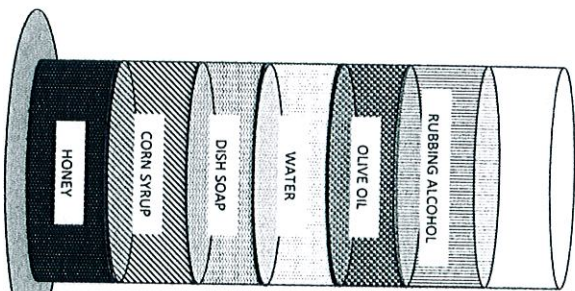
Use this formula to figure out density:
 $Density = mass \div volume$ or $D = m/v$.

Density measures how densely or tightly packed the particles of a substance are. The higher the density, the more tightly packed the particles are in a particular volume. Here is a chart containing the densities of several common substances.

Densities of Common Substances			
Substance	Density	Substance	Density
water	1.00 g/cm ³	seawater	1.025 g/cm ³
ice	.92 g/cm ³	aluminum	2.70 g/cm ³
gasoline	.70 g/cm ³	oil	.90 g/cm ³
lead	11.30 g/cm ³	gold	19.30 g/cm ³
white pine	.50 g/cm ³	rubber	1.10 g/cm ³
cork	.24 g/cm ³	bone	1.80 g/cm ³
iron	7.90 g/cm ³	human fat	.92 g/cm ³

According to **Archimede's principle**, objects that are less dense than water will float on water. Objects with a density greater than water will sink in water.

- Use Archimede's principle to predict which of the materials in the chart above will float on water. List them. Ice, gasoline, white pine, cork, oil, human fat,
- Now use Archimede's principle to predict which of the materials will sink in water. List them. Sea H₂O, rubber, bone, aluminum, iron, lead, gold
- Which is the most dense material listed above? gold (19.3g/cm³)
- Which is the least dense material listed above? cork (0.24g/cm³)
- Find the density when
 - mass = 25 grams volume = 5 cubic centimeters 5.0 g/cm³
 - mass = 150 grams volume = 75 cubic centimeters 2.0 g/cm³
 - mass = 500 grams volume = 1,000 cubic centimeters 0.5 g/cm³



SINK OR FLOAT?

Use the diagram to answer questions #1-5.

- Which liquid in the diagram is the most dense?
Honey
- How do you know that liquid is the most dense?
The most dense liquid sinks to the bottom
- How many liquids in the cylinder are less dense than water?
(2) Rubbing alcohol & olive oil
- Which is more dense, olive oil or corn syrup?
Corn syrup
- What do you think would happen if the amount of rubbing alcohol at the top were doubled?
Nothing! Changing the amount of alcohol does NOT change its density.

Type of Wood	Density
African Teakwood	0.98 g/mL
Balsa	0.14 g/mL
Cedar	0.55 g/mL
Ironwood	1.23 g/mL

9. Wood from a balsa tree has a density of 0.14 g/mL. If an entire balsa tree, with a mass of 2,000 kg, fell into a lake, would it float or sink?
Float!

10. Why?
The tree would float because the density of its wood is 0.14 g/cm³

which is much less in density than H₂O (1.0g/mL)

Liquid	Density
Chloroform	1.49 g/mL
Alcohol	0.79 g/mL
Gasoline	0.67 g/mL

- What type of wood sinks in water?
Iron wood
- If block of wood has a mass of 49 g and a volume of 50 mL, what kind of wood is it?
African Teakwood