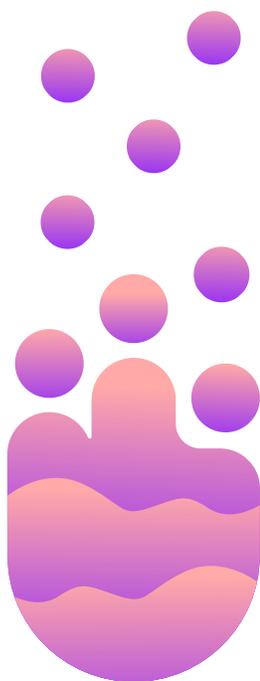


Exploring Density



This activity kit contains instructions to make your very own density column & a DIY lava lamp. Some materials have been provided for you, others you will need to collect from around your house. For directions and more discussion about the materials used in this kit, scan the QR code!



Activity #1

Materials for density column:

- Honey
- 100% maple syrup
- Milk (density: $1.026-1.034 \text{ g/cm}^3$)
- Liquid dish soap
- Water (density: 1.0 g/cm^3)
- Vegetable oil (density 0.92 g/cm^3)
- Graduated cylinder
- $\frac{1}{2}$ tablespoon (for measuring)



What is a density column?

A density column is formed by layering liquids that have different densities that don't mix together. The density of a substance depends on the mass and space occupied. When a material is less dense, it will float on the denser substance (like ice on water).

The layers in a density column do not mix for two reasons – First, because some of the substances are viscous (this means thick and sticky) and do not move quickly (honey doesn't pour easily), and second, because oils do not mix with water.

How To Build a Density Column

Note: If you do not have a particular liquid available, that is ok! Just skip the step and continue building your density column.

- Begin by pouring $\frac{1}{2}$ tablespoon of honey into your graduated cylinder
- Secondly, pour $\frac{1}{2}$ tablespoon of maple syrup into the graduated cylinder (directly over the honey)
- Now pour $\frac{1}{2}$ tablespoon of milk (directly over the maple syrup)
- Now pour $\frac{1}{2}$ tablespoon of liquid dish soap (directly over milk)
- Next pour $\frac{1}{2}$ tablespoon of water into the graduated cylinder, then put one drop of food coloring dye into the water.
- Lastly, pour $\frac{1}{2}$ tablespoon of vegetable oil (directly over the water)

Stop & Think

- Why did the ingredients not blend?
- Why did the liquids balance on top of each other without mixing?
- Would it be easier to swim through water or honey? Why?
- What would happen if you poured the liquids in another order?
- What do you observe when looking at your density column?

Activity #2

Materials Needed for lava lamp:

- Vegetable Oil
- Water
- Clear plastic jar
- Glitter (optional)
- Food Coloring
- Alka Seltzer Tablets
- $\frac{1}{4}$ cup (for measuring)

How To Build a Lava Lamp

- Fill your clear plastic jar with 1/4 cup of water
- Add 1-2 drops of any food coloring dye to the water & mix
- Pour ¾ cup of vegetable oil into the clear plastic jar
- Now break up the alka seltzer tablet and place one little piece in your clear plastic jar every 1-2 minutes
- Now wait and watch a reaction occur, you should see bubbles forming and moving the water and oil around.



Stop & Think

- Why do you think bubbles began to form when you dropped the alka seltzer into the lava lamp?
- Why did the food coloring only color the water?

-Key Terms-

Density- The amount of mass a substance has given how much space it takes up.

How compacted the material is.

Volume- The space taken up by an object or liquid.

Usually measured in liters (L) or milliliters (mL)

Observation- What you see or notice using your senses (sight, smell, taste, hearing, or touch).

Viscosity- The thickness of a liquid.

Prediction- What you think will happen next.

