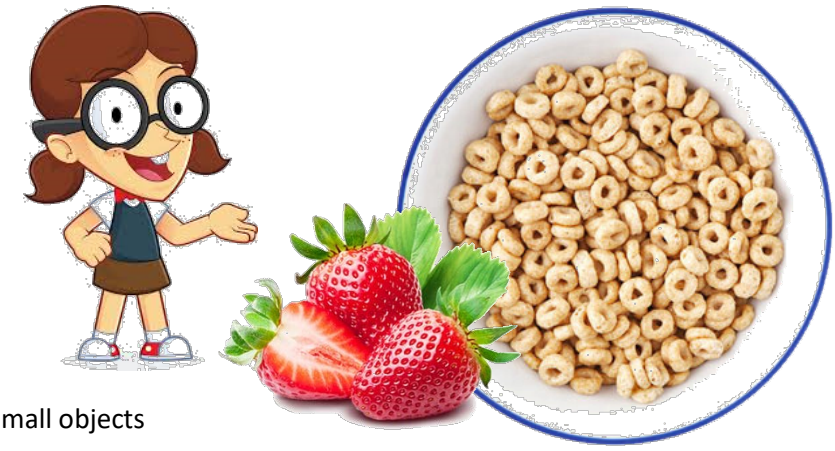
# Sinking Treats

Why do objects like wood float in water? Does it depend on their size? Try this cool experiment to investigate density by creating a colourful density column (see picture 2 below) and testing your favourite treats.

**You will need:**

A clear cup
Measuring cups
Food colouring
Stir stick
Water
Vegetable oil
Corn Syrup
Dish soap
Cheerios or mini marshmallows
A blueberry and a strawberry
Candies (Skittles or Smarties) or other small objects





**What to do:**

1. Add food colouring to the water so that it is a different colour from the other liquids.

2. Pour 60 ml of corn syrup into the clear cup.

3. Carefully add 60 ml of each of the other liquids in the following order: dish soap, water and vegetable oil. To assist in creating individual layers, place one end of the stir stick against the inside of the cup. Hold it on an angle just slightly above the layer of the previous liquid. Slowly pour the new liquid down the stir stick.

4. Collect the four items you will test. A blueberry, a small piece of strawberry, a Skittle and a Cheerio are good choices. Make a prediction about what will happen to each treat.

5. Carefully add each treat one at a time. Observe where each treat ends up.

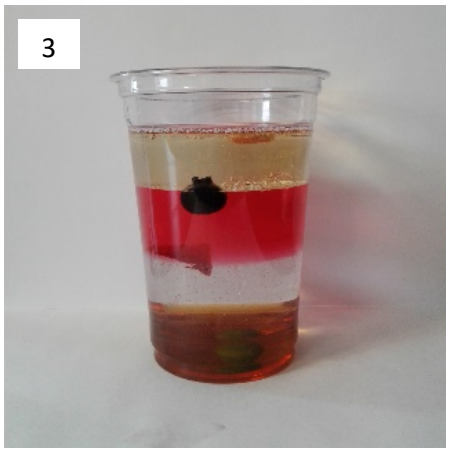
6. Why are some treats more buoyant than others? Does it matter what size they are? For example, if you cut the piece of strawberry in half, does it change what happens?

## What is happening?

Density measures how much mass is present in a given unit of volume. Mass is a reflection of the nature and number of particles in an object and density measures how tightly those particles are packed together.

While creating the density column, we kept the volume of the four liquids constant. Since density = mass/volume and the volume is constant, each liquid's mass will determine where it sits in the density column. A smaller mass, for a given volume of liquid, means a lower density. The densest liquid (corn syrup) will sink to the bottom of the cup, followed by Ivory soap and water, while the least dense liquid (vegetable oil) will float on the top.

| Liquid | Density at 25°C (g/ml) |
|---|---|
| Corn Syrup | 1.3 g/ml |
| Water | 1.0 g/ml |
| Vegetable Oil | 0.9 g/ml |
| Dish Soap-Ivory | 1.04 g/ml |




Each treat will sink to a layer that has a similar density to its own, so you can use its position in the density column to predict its approximate density. Cheerios or mini marshmallows will float on top of the oil layer. Strawberries and blueberries will sink to the water layer and Skittles and Smarties will sink to the bottom of the corn syrup.

## Extend the Investigation:

1. Use additional liquids, such as baby oil, milk, or maple syrup and retest your treats. Observe any changes in where your treats end up.

2. Use additional items, such as a bottle caps, grapes, craft beads, or different brands/sizes of similar treats. Compare their relative densities.

3. Have older students calculate the density of each liquid by weighing a specific volume of each liquid and dividing the measured mass by the known volume. Estimate the density of any object tested by providing a possible range for its density, based on which layer it lands in.