

Rainbow in a Glass Experiment

This is a fun experiment where we explore water density by making a rainbow in a glass.



Green-Schools



GREEN-SCHOOLS
STAY HOME - WATER

Set up time: 10 minutes Wait time: None

What do you need?

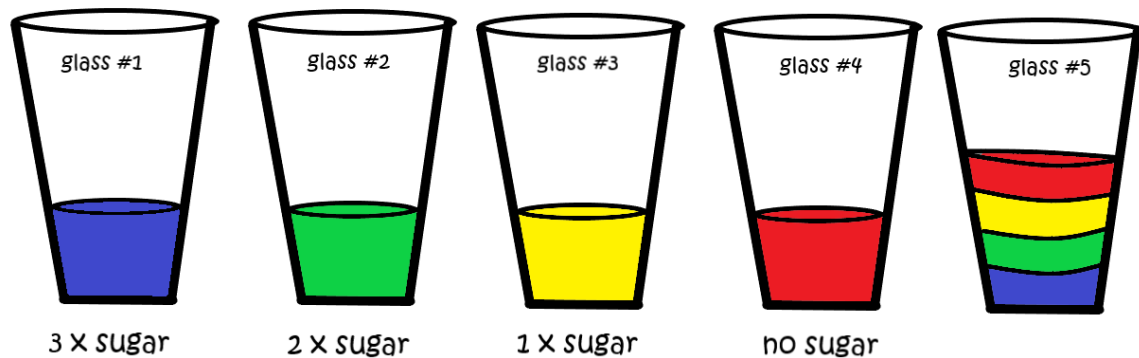
1. 5 glasses or jars
2. 4 different food colourings e.g. blue, green, yellow and red
3. Access to a tap
4. Sugar
5. A straight straw or syringe (if you need to buy straws try to get compostable or reusable ones!)



What do you do?

1. Place four of the glasses in a row and half fill these glasses with water – warm water works best. Make sure they are all filled to the same level.
2. Use a teaspoon to put 3 teaspoons of sugar into the first glass, give it a good stir to make sure the sugar dissolves.
3. Next, put 2 teaspoons of sugar into the second glass and stir.
4. Put 1 teaspoon of sugar in the third glass and stir.
5. Leave the fourth glass without any sugar.

- Next, get your blue food colouring and carefully drop a couple of drops into the first glass (the one with three spoons of sugar), give it a good stir to mix in the colour!
- Put a couple of drops of green colouring in the second glass and stir.
- Put a couple of drops of yellow in the third glass and stir.
- Put a couple of drops of red in the fourth glass and stir.



Note: If you only have one colour you can still show a change by using more, or less, food colouring in each glass. For example, put ten drops of colouring in the first glass, five drops in the second glass, two drops in the third and none in the fourth.

- Using a syringe or a straw, extract some of the coloured water from glass 1 and place it in your fifth (empty) glass.
- Repeat step 10, taking water from glass 2 this time and carefully dropping it into the fifth glass, on top of the first water sample. Repeat with water from glass 3 and 4. What do you see?

Note: To move water using a straw, place the end of the straw into the water so that it comes up about an inch on the straw. Hold your thumb over the top to create a vacuum, then transfer to the new glass (keeping your thumb on top) and then, when ready, release.



Explanation:

In our Sink-the-Boat experiment we learned about density, and how if something is denser than water, it sinks, but if it is less dense than water it floats. Well, even water can have different densities...

The saltwater of the ocean is much denser than the freshwater of rivers and lakes. You'll notice this if you've ever swum in them. It's much easier to stay afloat in the sea than it is when you're swimming in a lake. At the bottom of the ocean there are even lakes of super-salty water called brine pools, which look just like ordinary lakes but are underwater!

In this experiment the water with the most sugar in it is the densest, so it sinks to the bottom of the fifth glass. The other water samples stay in neat layers because of the density of their water, depending on how much sugar was added to them.

Watch similar experiments here:

DIY Rainbow Water:

<https://www.youtube.com/watch?v=ZxokQCLWka8&list=WL&index=34&t=0S>

Sick Science Rainbow Water (includes straw-use demonstration):

<https://www.youtube.com/watch?v=yh9HOU2oQEK&list=WL&index=32>