

Kitchen Science activity: Density Rainbow

What You Need

- Sugar or salt
- Water
- Food coloring
- Tablespoon
- 5 glasses or clear plastic cups

The Process

1. Line up five glasses. Add 1 tablespoon (15 g) of sugar or salt to the first glass, 2 tablespoons (30 g) of sugar or salt to the second glass, 3 tablespoons of sugar or salt (45g) to the third glass, and 4 tablespoons of sugar or salt (60 g) to the fourth glass. The fifth glass remains empty.
2. Add 3 tablespoons (45 ml) of water to each of the first 4 glasses. Stir each solution. If the sugar or salt does not dissolve in any of the four glasses, then add one more tablespoon (15 ml) of water to each of the four glasses.
 - You can also have an adult help you heat the solution a little to cause the salt or sugar to dissolve quicker. Make sure that you let it cool down before using it for your experiment!
3. Add 2-3 drops of red food coloring to the first glass, yellow food coloring to the second glass, green food coloring to the third glass, and blue food coloring to the fourth glass. Stir each solution.
4. Now let's make a rainbow using the different density solutions. Fill the last glass about one-fourth full of the blue sugar or salt solution.
5. Carefully layer some green sugar or salt solution above the blue liquid. Do this by putting a spoon in the glass, just above the blue layer, and pouring the green solution slowly over the back of the spoon. If you do this right, you won't disturb the blue solution much at all. Add green solution until the glass is about half full.

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Lesson adapted from: www.thoughtco.com



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6. Now layer the yellow solution above the green liquid, using the back of the spoon. Fill the glass to three-quarters full.

7. Finally, layer the red solution above the yellow liquid. Fill the glass the rest of the way.

Discuss:

Which layer is the most dense (has the most solute in the solution)?

-The blue solution has the most sugar or salt in it, with the same amount of water. It is the densest.

What happens when you layer them in a different order?

-The colors will mix quicker if you put denser solutions on top. Try it and see how quickly they mix!

What do you think will happen if you let the layers sit overnight?

-Eventually, the colors will all mix together because they are all at the same temperature. The sugar or salt will mix with the rest of the layers because it dissolves into the solution.

Did you know?

There are layers of different densities in the ocean, where layers of colder, saltier water flow underneath warmer water that melted from ice. The movement of this water causes deep-ocean currents. This process is called “thermohaline circulation.” Read about it online from NOAA, the National Oceanic and Atmospheric Administration!

https://oceanservice.noaa.gov/education/tutorial_currents/05conveyor1.html

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