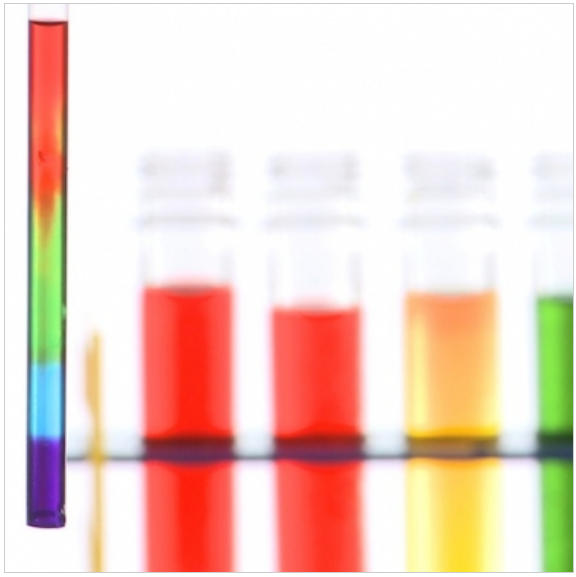
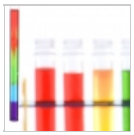
SALT WATER DENSITY STRAW

Use knowledge of density to create a colorful rainbow inside of a drinking straw.





SUBMIT A REVIEW

Density can be a difficult scientific property to grasp, that's why we like making it colorful, fun, and (most importantly) simple! The Salt Water Density Straw is the epitome of kitchen science. You'll use materials are right in your house, and with just a bit of salt, you'll create a colorful experience that will have young scientists understanding density in moments.

Materials

- Salt
- Water
- Measuring spoons
- Food coloring or Color Fizzers
- Clear drinking straws
- Cups (≥ 9 oz)
- Deep containers like Baby Soda Bottles (optional)

EXPERIMENT REVIEWS PRINT EXPERIMENT

EXPERIMENT

1. Get your hands on six cups. They don't have to be the same size, and they don't need to be clear, but it will help add to the experience.
2. In each of the six cups, add one of six different amounts of salt.
   - 1 tsp
   - 2 tsp
   - 3 tsp
   - 4 tsp
   - 5 tsp
   - 6 tsp
3. With the salt in each cup, add 9 oz of warm water. Stir the solution until all of the salt has dissolved.
4. Using food coloring or our non-staining Fizzers, dye the solutions in each cup a different color.
5. If you would like, you can transfer the solutions to a deeper container, like our Baby Soda Bottles. This will give you a bit more room to create your Salt Water Density Straw.

6. Grab a clear drinking straw and, if you haven't already, remove it from its wrapper.
7. Hold the straw near one end, wrapping your four fingers around the straw and placing your thumb over the straw's opening.
8. With your thumb off of the straw's opening, dunk the opposite end of the straw into the "1 tsp" solution. "Cap" the straw with your thumb and remove the straw from the solution.

9. Now that you have the first solution in the straw, dip the end of the straw into the "2 tsp" solution. Dip the straw further, this time, than you did into the first solution. Once you've dipped the straw, remove your thumb and quickly replace it. Remove the straw and you should have the first and second solutions in a stack inside of the straw.
10. Continue the dipping process until you have all six solutions inside of the straw. It's a density column of salt water!

11. Remove your thumb and start all over again!

SWITCH IT UP!

Try making the solutions with sugar. Does it work?

What happens if you dip the straw into the solutions out of order?

HOW DOES IT WORK?

Density is the measurement of how much "stuff" is packed into a specific space. That's how we get the equation for density. Density = Mass (stuff) ÷ Volume (space). Nearly every substance and material imaginable has a different density. This is especially the case for the solutions you make out of salt and water.

By varying the amount of salt in the solution but keeping the water consistent at 9 oz, you create solutions that have different densities. The more salt is mixed into a water-based solution, the higher the density of that solution.

FUN FACT: This dramatic salt water density change can be experienced in real life. While humans will (sort of) float in the oceans of the world, we really float in lakes like Utah's Great Salt Lake and the Dead Sea in Israel and the West Bank.

So density explains why the liquids stack atop each other inside of the straw, but how do the liquids stay in the straw? That has to be water wizardry! You expect the solutions to pour out of the straw as you remove the straw from being submerged. However, thanks to cohesion (like molecules attracting each other) and adhesion (different molecules attracting each other), there is surface tension at the bottom of the straw. The surface tension is strong enough to hold the solutions in the straw... as long as air pressure isn't added to the equation. That's why you need your thumb to cap the straw. This removes air pressure from pushing down on the solutions in the straw. Remove your thumb and the added pressure forces the solutions out.