JK SCIENCE LAB

SHAVING CREAM RAIN CLOUDS

YOU WILL NEED:

- Shaving cream
- A plastic cup filled with water
- A straw
- Blue food colouring

WHAT TO DO:

1. Add shaving cream to the cup of water. Fill it up over the brim!
2. Use the straw to collect some of the blue food colouring. Place the end of the straw into the food colouring and then put your finger on top of the straw. As long as you keep your finger on the end of the straw, you should now be able to lift up the straw without the food colouring falling out. This works due to air pressure pushing the food colouring up into the straw.
3. Carefully add drops of blue food colouring on top of the shaving cream.
4. The food colouring will slowly move through the shaving cream until it reaches the water layer. At that point you'll see the food colouring begin to stream out into the water.
5. As the food colouring is denser than the water, the food colouring drops to the bottom of the cup. A simple rain model!

WHY DOES THIS HAPPEN?

Food colouring is denser than the shaving cream and the water. As such, the food colouring drops to the bottom of the cup, acting like rain!

Rain is a form of precipitation, whereby water vapour in a cloud condenses to form large enough drops to then fall out of the sky. Precipitation can take many forms: rain, drizzle, hail, snow and sleet. It all has to do with relative humidity, which means how much water there is in the air compared to the temperature. Warmer air can hold more water vapour than colder air.

- If the temperature rises and the amount of water in the air is the same, the relative humidity has fallen.
- If the temperature falls and the amount of water in the air is the same, the relative humidity has risen.

If the temperature of the air falls past the temperature needed for water to condense, the water in the air will form liquid droplets which will the fall as rain. We call the temperature that water vapour condenses the dew point. If it is cold enough (below freezing at ground level), these water droplets will rapidly freeze and form snow which can reach the ground if this temperature is below freezing at ground level.

Rain is a major part of the water cycle, where evaporating water from water bodies and the forms clouds which eventually forms rain to begin the process over again.

VARIABLES TO TEST

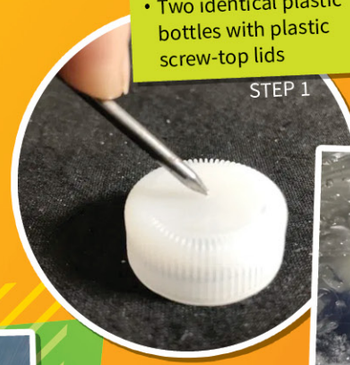
- Try different food colours
- If you place shaving cream on another liquid such as canola oil or glycerine, does the experiment work?
- Can you use a different foam on top of the water such as pea foam or soap foam?

From Ben Newsome, Fizzics Education.
fizzicseducation.com.au

TEMPERATURE & THE DENSITY OF WATER

YOU WILL NEED:

- One kettle
- Oven mitts
- A funnel
- One ice bath
- Two identical plastic bottles with plastic screw-top lids
- Something to make a hole with. *e.g. A nail or a drill*
- Red and blue food colouring.
- Adult supervision and help



WHAT TO DO:

1. Carefully bore two holes on opposite areas of each of the plastic lids. The larger the hole, the faster the result of the experiment. **WARNING:** Please ensure that an adult hand drills the lids prior to children commencing the experiment, or use stretched balloons with holes instead.
2. Fill the 5 litre container with 3 litres of room temperature water.
3. Fill one of the plastic bottles with water, add blue food colouring, screw on the lid and stand it in the ice bath for five minutes.
4. SAFETY: Adults only. Boil the kettle and allow to cool briefly. Carefully pour the hot water into the other plastic bottle and add red food colouring. Screw the lid on whilst wearing the oven mitts for your safety.
5. Gently lower both bottles to the bottom of the 5 litre container, making sure that each bottle has the holes in the same vertical position as each other.
6. Allow the coloured water to seep into the surrounding water. You can speed the process by gently squeezing the sides of the bottles. However, be careful not to disturb the main body of water.

WHY DOES THIS HAPPEN?

Warm water will float above cold layers of water because it is less dense. This is why it's often more comfortable to swim along the surface of a lake rather than dive down to the colder depths.

In still bodies of water such as lakes and dams, very distinct layers of warm and cold water form. This phenomenon is called thermal stratification and it can determine the variety of life found within the lakes and reservoirs.

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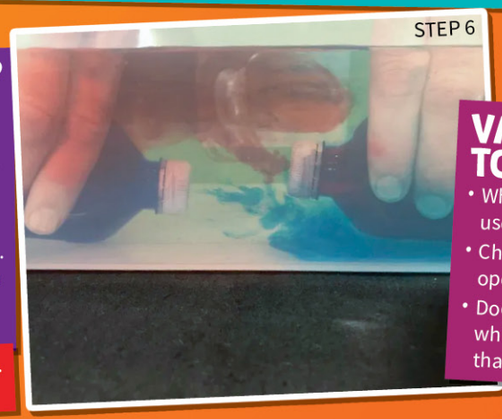

VARIABLES TO TEST

- What happens if you use salty water?
- Change the size of the opening of the bottle.
- Does it matter about which type of liquid that you use?