

Make Your Own Lava Lamp

October 03, 2024 / DIY / STEM Activities / Chemistry / Ages 6 - 8 / Homemade Lava Lamp



This lava lamp experiment is super cool! Watch vibrant colours dance in your homemade lava lamp, bringing brilliance to your space. Adding baking soda or effervescent tablets will make this science activity even more exciting! You can also install a small LED light at the bottom to experience the magic and beauty of science in a dark environment.

- Age: 6-8
- Time: Less than 30 minutes
- Mess Level: A bit messy

Materials Needed:

Oil
Cup
Food colouring
Spoon
Baking soda
Vinegar
Dropper

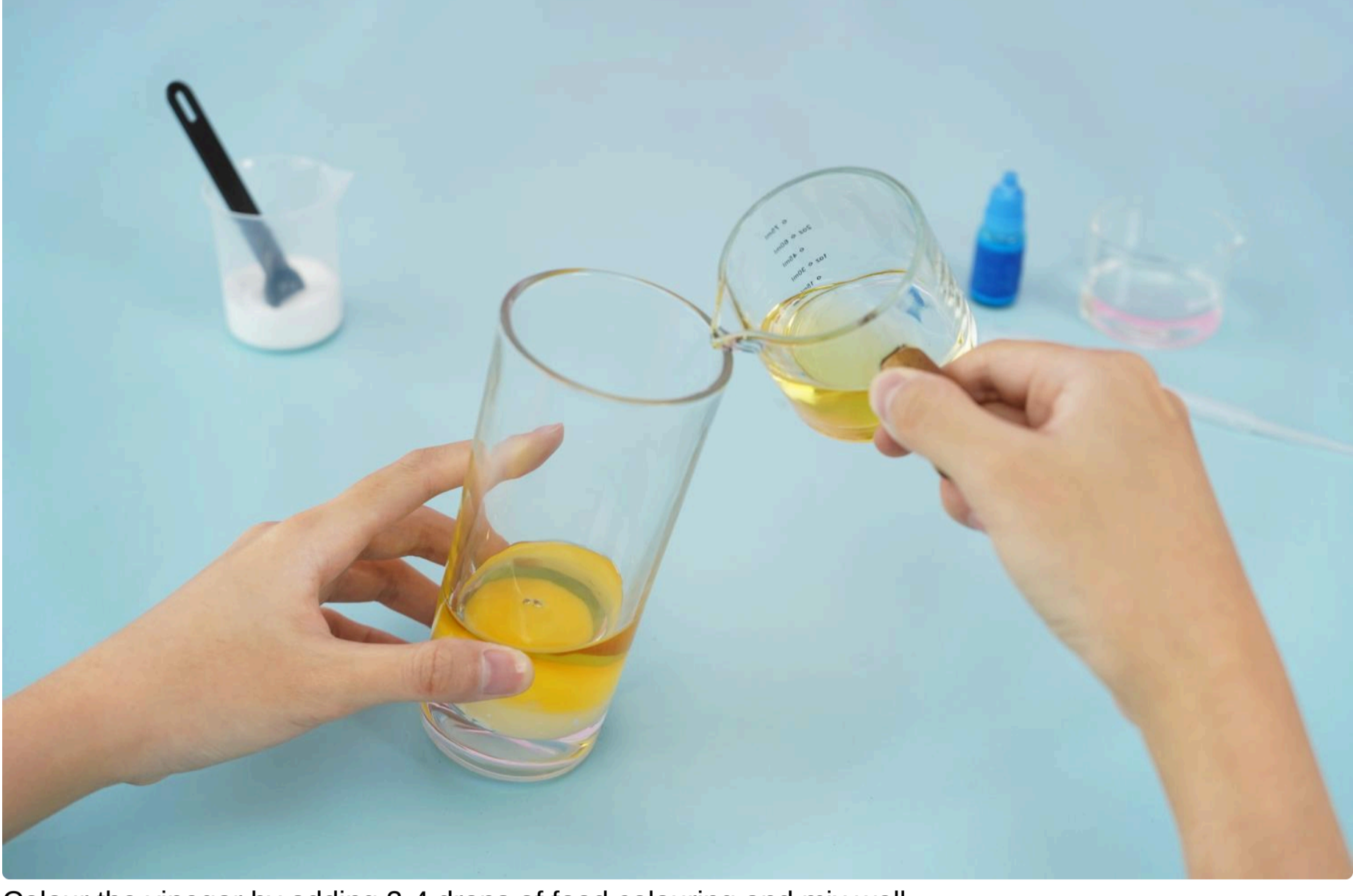


Step-by-Step Instructions:

1. Add baking soda to the cup, letting it settle evenly at the bottom. The baking soda should occupy about a quarter of the cup.



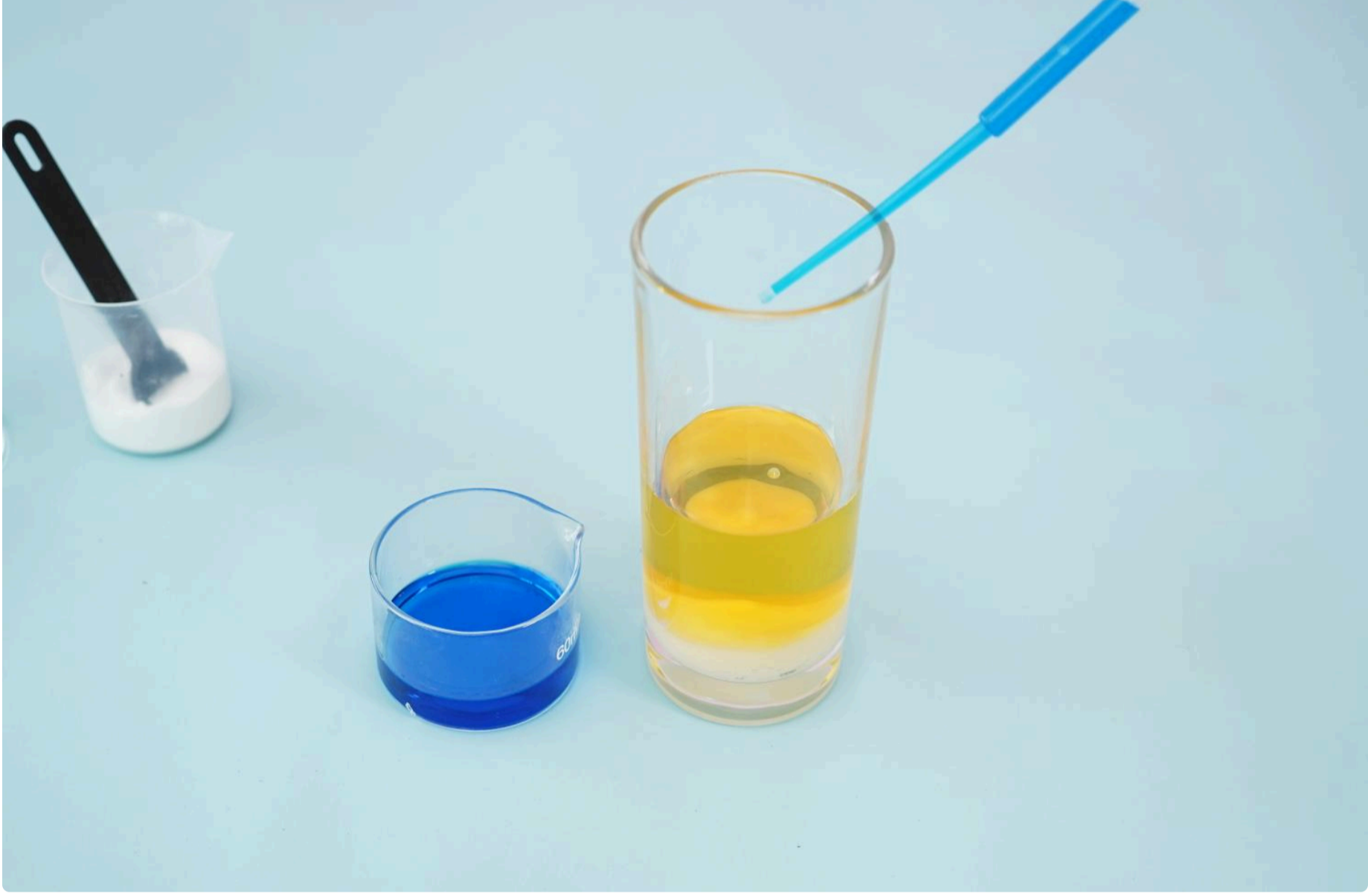
2. Slowly pour oil along the side of the cup, being careful not to disturb the baking soda layer.



3. Colour the vinegar by adding 3-4 drops of food colouring and mix well.



4. Use a dropper to draw up the coloured vinegar and drop it into the cup. Observe the reaction of the food colouring.



5. Continue adding vinegar until the bubbles stop reacting. If the dropper is long enough, you can insert it into the baking soda layer to trigger a massive reaction.



6. Try adding multiple colours to create the effect you want.



The Science Behind It:

The stunning lava lamp involves multiple scientific principles, including density and acid-base chemical reactions. Let's break it down:

1. **Density Principle:** In the lava lamp, we have two liquids, vinegar and oil. They have different densities, so when we pour them into the glass container, vinegar, being heavier than oil, sinks to the bottom. Oil, being lighter, floats on top.
2. **Acid-Base Chemical Reaction:** When baking soda (an alkaline compound) combines with vinegar (an acidic compound), a chemical reaction occurs, producing carbon dioxide gas. The gas has a lower density than water, so bubbles carry the coloured water upwards. When the bubbles reach the surface, the gas is released, the water in the bubbles becomes heavier, and sinks back down.
3. **Liquid Interactions:** Vinegar and oil don't mix because vinegar is polar while oil is non-polar, meaning their molecules interact differently. Polar and non-polar molecules repel each other, so the vinegar droplets don't mix with the oil, creating the colourful lava lamp style.