Saint Patrick's Day Experiments with Rainbows!

St. Patricks Day is celebrated on March 17th. A common symbol of the holiday is a rainbow. The rainbow also represents God's promise to never again flood the earth again! Before you do these experiments with your children, take the time to read about God's promise to Noah in **Genesis 9:8-17**. **Every time you see a rainbow, remember that God keeps his promises!**

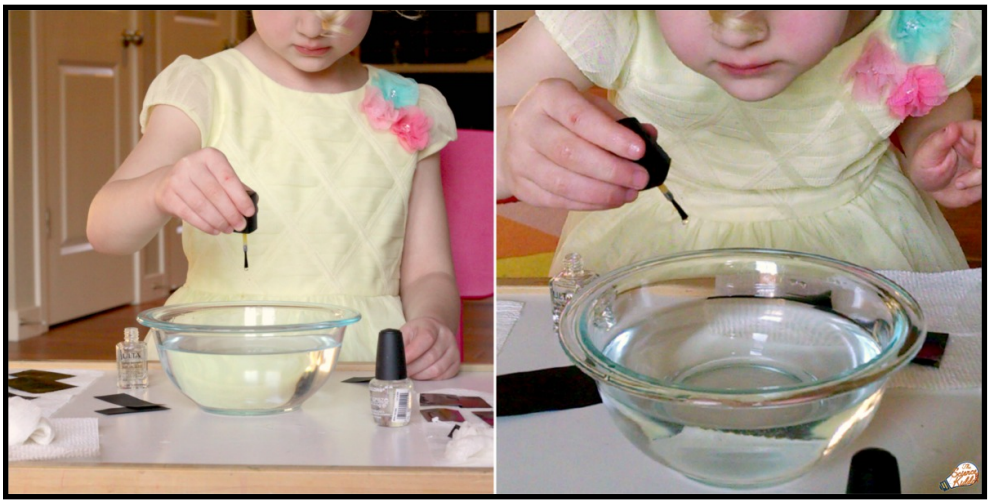
Adapted from sciencekiddo.com

Materials Needed:

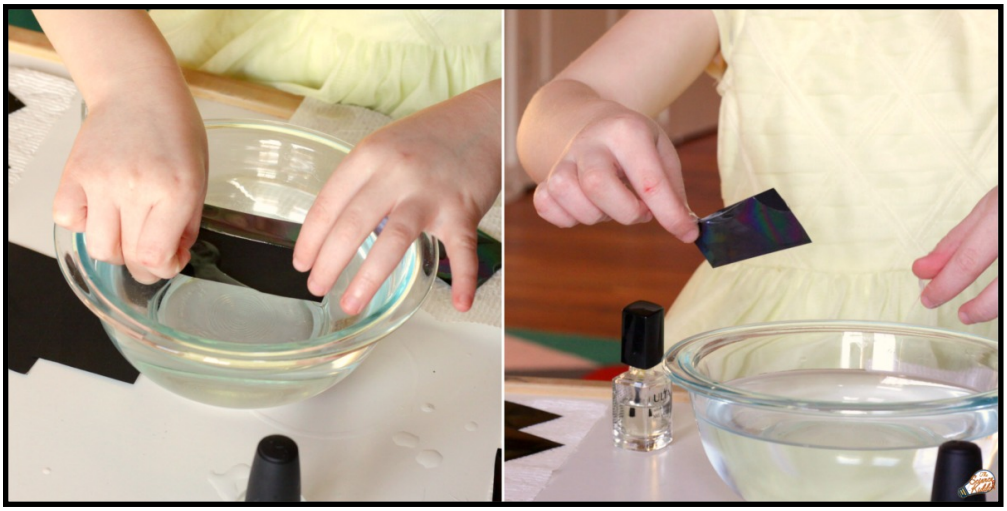
- A bowl filled with water
- Clear nail polish
- Rectangles of black paper or black card stock (about 3-5 inches long on the sides)

How to make rainbow paper:

Drop one drop of clear nail polish into the bowl of water.

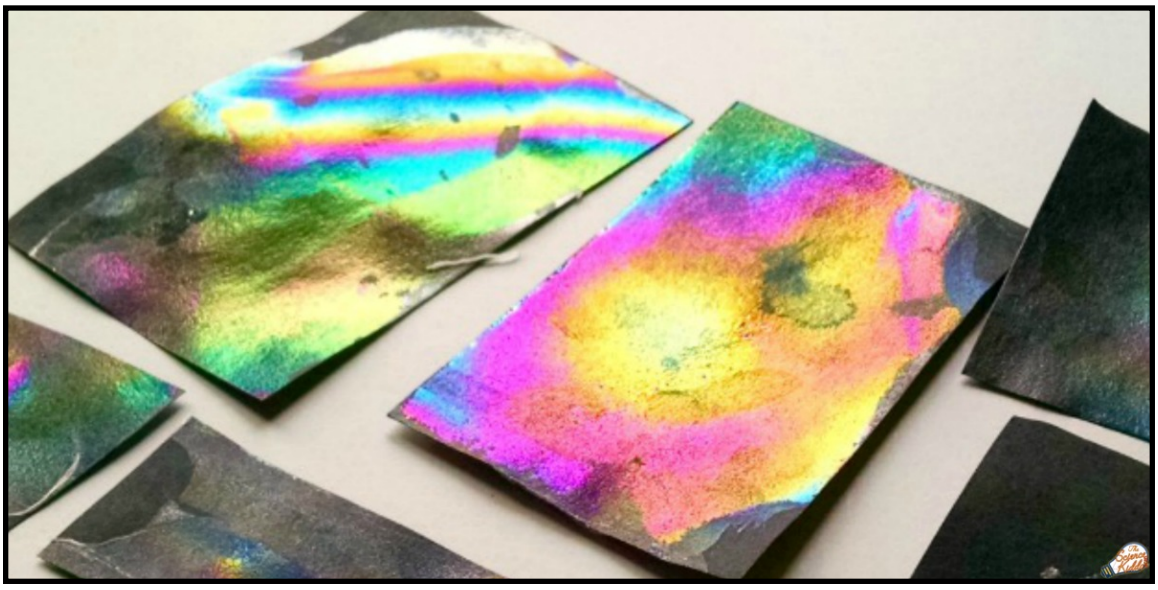


Wait a few seconds and then dip a piece of black paper into the water and pull it out.



You can also try placing the paper under the water first and then dripping one drop of nail polish on top of it. The nail polish disperses across the surface of the water within in seconds. Once the nail polish spreads out, it's safe to pull the paper out of the water.

Experiment to see which technique works best for you!



The nail polish dries quickly on the surface of the water, which creates a film that won't stick to the paper. To do this activity successfully it needs to be done quickly. Be sure to dip the paper into the water within 10-15 seconds after the drop of nail polish goes in.

If the nail polish does create a dry film on top, simply scoop it off and try again more quickly!

The Science Behind Rainbow Paper

When you dip the paper into the water it gets coated with a thin layer of nail polish. The rainbow colors you see are caused by thin-film interference.

You will notice that the colors on the paper change as the you tip the paper back and forth. This happens because light hits the paper at different angles as you tip it.

Grow a Rainbow Experiment

Here is what you will need for this activity:

- Paper Towel
- Washable Markers
- Water
- 2 Small Glasses

Tips:

- You need absorbent paper towel or napkin
- You must use washable markers – make sure to check it's washable as not all Crayola brands are washable
- Do not place the end of the paper towel too deep into the water or the dye will dissolve into the water instead of traveling up the paper towel
- The shorter the paper towel – the better it works as there is less for the marker dye to have to travel across
- Add lots of marker to the ends. You need lots of dye for it to travel upwards.

Growing Rainbow Experiment Instructions

1. Fold over a piece of paper towel (so you have 2 pieces on top of each other). Trim the length to be 7.5 inches (any longer and the rainbow may not connect fully).

2. Draw rectangles of the rainbow colors on each end.

You want to make sure to fill these colors in well so there is enough dye to travel across the paper towel.

3. Place 2 cups with water filled 3/4 full. You only want the bottom of the paper towel in so leave some space from the top of the cup.

Then place the paper towel into the cups, with one end in each cup.

4. The washable marker dye with slowly make it's way up with the water to meet the other side in the center of the paper towel.

5. Leave the paper towel for 10-15 minutes and it will eventually connect the colors together.

What is the Science Behind This Experiment?

This science experiment is a great example of chromatography. Chromatography is a way of separating out a mixture of chemicals. If you ever got a paper with ink wet you would have seen the ink move across the page in streaks.

Capillary action makes the marker dye move up the paper towel. The water moves upward through the paper towel, lifting the washable dye molecules with it. Because the washable markers are water based, they disperse in water.

Set up a few different scenarios and hypotheses. For example, if you were to try this experiment without any dye, you would still see the water rising upwards towards the center of the paper towel.

If you were try this experiment with permanent markers it would not work. This is because the markers are not water based (they are alcohol based) so the dye in the marker does not travel with the water. You can also show that permanent markers will disperse with rubbing alcohol but not with water.