

Chemistry Tie-Dye

OVERVIEW

Art can be science too! Get creative AND learn the science of chemistry using just coffee filters, markers, crayons, and water.

WHAT ARE WE LEARNING?

Students learn about the properties of different art supplies. The dyes used in markers mix easily with water, while other kinds of colors do not. We're using the science behind the properties of markers and crayons to make unique art.

Materials

- white coffee filters
- markers
- crayons
- small cup of water
- pipet or straw (optional)
- plastic tray, cookie sheet, or plate (optional)

Alternate Materials

INSTEAD OF : coffee filters USE : paper towels

INSTRUCTIONS

1. Use markers AND crayons to color and decorate the coffee filter however you like. Get creative! You can't really go wrong with this step, but we recommend using multiple marker colors and leaving plenty of white space on the paper. Keep in mind that designs drawn using marker will spread out, swirl, blend, etc for a watercolor or tie-dye effect when you add water. Designs drawn with crayon will not change. You might want to try drawing a picture with crayon and making dots or scribbles with marker to fill in the background.
2. Place filters onto a cookie sheet or tray. Use a pipet to drip water onto the paper. If you don't have a pipet or dropper, see note below for how to drip water using a straw. Alternatively, dip a paintbrush or finger into water and "paint" water onto the paper.
3. Wait for paper to dry, then display your art. It looks great taped in a window! Surprised by how the colors turned out? Try it again!

Great for Preschool
through elementary+!



Image 1: Materials used for this activity

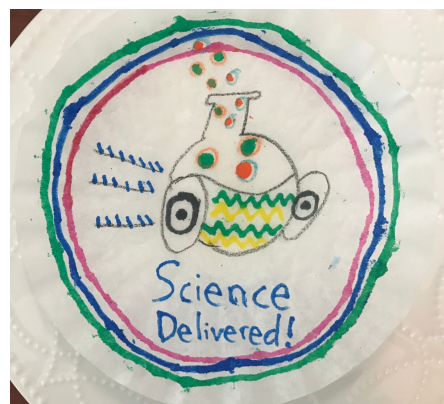


Image 2: Decorated filter paper before adding water. We used many colors in marker and crayon to show the effect adding water has on both materials.



Image 3: After adding water, all the marker dye has spread and blended over most of the paper. The crayon designs (outline of flask and bubbles) have not changed!

NOTES

You can use a straw to drip water onto the coffee filter with these steps: 1. Stick the straw in the water, 2. Cover the top of the straw completely with your finger, which will trap the water inside, 3. Move the straw, keeping the top covered with your finger, 4. When you are ready to release the water, remove your finger.

If you don't have a pipette or straw, use a paintbrush or your finger to paint water over the picture.

For younger kids, it can be helpful to explain before they start drawing that whatever they draw in marker will spread and blend like tie-dye (see explanation under "The Science" below) so they don't get upset by the image changing. We also recommend describing this activity as an experiment and not a picture. This way they are less inclined to try to draw a picture that looks a certain way.

For older elementary ages, we recommend downloading the companion worksheet. Encourage them to predict what effect adding water will have on the marker and crayon. After doing the experiment, discuss the result, then encourage them to write down the result in their own words and what they learned about the differences between markers and crayons. They might expand to testing different types of markers or other writing implements like pen, colored pencil, highlighters, and more! You can also try drawing on different backgrounds like regular paper or cardboard.

THE SCIENCE

Some chemicals mix easily with water, while others do not!. The type of dye used in making children's markers is an example of a chemical that mixes really well with water. When you add water to your decorated image, the dye starts mixing with the water immediately: you see it spreading out wherever there is water! The coffee filter also helps the dye and water spread around because it is made of a special kind of paper that interacts well with water.

Crayons are made of a different kind of material that does NOT mix well with water. Crayons are made of wax and a different kind of dye than markers. Crayon wax and dye do not mix with water, so your crayon designs look exactly the same on your eggs before and after adding water!

TRY THIS!

You can find other kinds of dye that mix with water! Drop a Skittles candy or a drop of ordinary food coloring (not gel food coloring) into a clear cup of water. Watch the colorful dye start swirling into the water as it mixes together! Pour a little bit of vegetable oil on top. Oil is an example of something that does NOT mix with water. Even after the colorful dye is totally mixed into the water, the oil will still sit on top and never mix in!

ADVICE FOR DOING SCIENCE WITH YOUR KIDS

- Encourage exploration and curiosity - science is about more than facts and content (although these things are important too!)
- Consider writing down your child's questions and ideas during the activity. You may be able to turn these into a future research project or activity!
- Consider getting a dedicated science journal for your child where they can keep all their thoughts, ideas, and notes on their experiments.
- Do not worry about not knowing the answer to questions! Many "simple" kids science activities have very complicated, or even unknown(!) science behind them. Even scientists will often not know the answers to questions outside their field. No one knows everything! Be honest about not knowing the answer and suggest trying to figure it out together.
- Deviations from exact instructions can often be fruitful - especially if the child has been inspired and wants to try out another line of investigation.
- For new homeschooling parents - in many states, the science standards are called the "Next Generation Science Standards," or "NGSS." They can be complicated to parse through but in essence they want student to learn not only content (called "disciplinary core ideas" or "DCI") but also the practices scientists and engineers use ("scientific and engineering practices" or "SEP") and also concepts that cut across all fields ("crosscutting concepts" or "CCC").

