



Full STEAM ahead with 4-H!

Clothing & Textiles Science

Learn a fast & easy way to “Tie-Dye” clothes! This process uses household items and is quicker than regular tie dying. By using bleach, you are able to use a variety of techniques to get different designs that may surprise you!

Background

What is bleach?

Bleach is a common household cleaning base that can be powerful at removing stains from clothing or other surfaces. Bleach is a great cleaning solution because it serves as a disinfectant that can kill mold, germs, and bacteria. You can use bleach to whiten your clothes, lighten your hair, or even brighten your teeth! There are several different types of bleach, the most common household version is chlorine bleach (a water-based product that contains a chemical called sodium hypochlorite). Store bought bleach is diluted with water. (It's like you're buying salt water that has been changed slightly by electricity!)



How does it work?

Bleach works by removing color. Color is created through chemical compounds, called chromophores, that reflects light. For example, a blue dress contains chromophores that reflect blue light that our eyes see as the color blue.

Bleach releases oxygen molecules in a process called oxidation. The oxygen released by bleach breaks up the chemical bonds of chromophores. The changed chromophore molecules either reflect no color or a color outside the visible spectrum. The absence of color appears white.

Be careful!

As stated above, bleach is a powerful chemical. Wear clothes that can be stained and avoid splatter so that you don't stain your clothes. Work in a well ventilated area (like outside). Ensure bleach stays away from eyes or open wounds.

Reverse tie dye

Goals

- Realize how the absence of color impacts the initial color of material.
- Discover different ways to achieve desired designs, through tie-dye techniques.
- Learn how bleach can be used effectively and correctly in household applications.



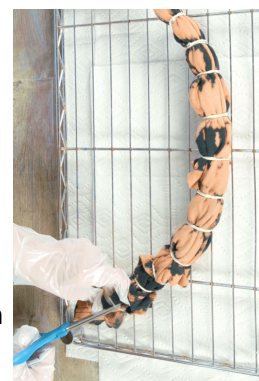
Supplies

- Dark Colored Shirt (black, navy, brown, maroon work great!)
- Bleach: approximately 2 cups per shirt, any brand
- Rubber Bands (hair ties, twine, or string can work too)
- Scissors
- Rinsing station
- Pouring Device (measuring cups work best)
- Fork (optional)
- Tongs (optional)
- Spray Bottle (optional)
- Stickers/Shape Cut-outs (optional)
- Detergent (optional)
- Dryer (optional)



Directions

- Gather all of your supplies! Pick a dark colored shirt to use.
- Guess what color the bleach might turn your shirt? Once the bleach removes color, what (color) will it look like?
- Using string, rubber bands, or even hair ties, section off your shirt to create your design by "tying".
 - Note: everywhere the bleach touches color will be removed
 - Design ideas include:
 - Traditional Tie-Dye techniques like: Spiral, Bubble, Bullseye, Stripes, Scrunch, or more! You can apply some of the tie dye techniques found online at <https://www.tiedyeyoursummer.com/techniques>
 - Spray Bottle Mist over shirt (with or without ties)
 - Stencil
 - Resist Dyeing with tape or other materials
- Prepare the rinsing station. Have about 9 cups of water ready in a tub, sink or bucket.
- Take your tied shirt to the rinsing station and pour approximately two cups of bleach in a pouring device.
- Add bleach to the dry shirt by pouring it onto the material over your rinsing station.
 - Pour the bleach directly on rubber bands and the areas you would like lightened.
- Let bleach soak in for about 10-15 seconds (you should already see it start to work). Pour excess bleach all over the shirt. Turn the shirt over and repeat. Wait about 20 seconds for bleach to saturate the shirt. Remember to get both sides of the shirt.
 - Note: the more bleach used and the longer bleach is left on, the more color is removed.
 - To stop the effects of the bleach, dunk shirt in the rinsing station you have prepared.
 - If possible, wear gloves to avoid bleach contacting your skin.
- Take off ties! Use scissors if needed to remove carefully.
- Rinse! Thoroughly rinse bleach from shirt with warm water. Tinted water may come from the shirt. Squeeze water out and continue to rinse until water is clear.



- Wash Shirt! This step is important. If not completed bleach may transfer to other clothing in future washes. There are two ways you can wash your shirt, by hand or in the washing machine.
 - Handwashing: Pour about ½ cup of detergent onto the shirt in the rinsing station. Work in the soap throughout the shirt. Rinse detergent out with water, you may notice the same tinted water coming from the shirt; continue rinsing until water is clear again. Wring out excess water. (This will help set in the colors so they don't bleed out in future washes).
 - Washing Machine: Wash shirt separately in machine with a little detergent using warm water.
- Dry shirt! (Air dry, or place in the dryer).
- When done, clean up the work area to ensure no bleach is left wet on surfaces. Wash hands thoroughly.



Reflect

- Did your design turn out how you imagined?
- What could you do differently next time?
- What other design techniques would be fun to try?
- What are other ways you could use bleach in clothing or other designs?

Want to extend your learning? Try out these ideas!

- Clothing & Textiles: <https://extension.umn.edu/projects-and-more/4-h-clothing-textiles-project>
- Engineering Design: <https://extension.umn.edu/projects-and-more/4-h-engineering-design-project>
- Home Environment: <https://extension.umn.edu/projects-and-more/4-h-home-environment-project>

Source:

- <https://wonderopolis.org/wonder/how-does-bleach-work>
- <https://www.stevespanglerscience.com/lab/experiments/the-power-of-bleach/>
- <https://www.instructables.com/id/Reverse-Tie-Dye/>
- <https://www.instructables.com/id/Quick-Reverse-Tie-Dye/>
- <http://mommieswithstyle.com/diy-reverse-tye-dye-easy-at-home-project-with-clorox/>

