



**Who says all the fun has to happen at The Tech Interactive?
This DIY biotinkering activity can be done with inexpensive
store-bought supplies and things you find around your home!**



Introduction

For thousands of years, people have used colors collected from nature to create art. Many plants have natural pigments, and the one in red cabbage (anthocyanin) is very special — it can change color when it's mixed with ingredients from your kitchen. In this activity you will use acids (like lemon juice) and bases (like baking soda) to make your own rainbow of colorful paints from red cabbage!

Design Challenge

Mix your own colorful paints using pigment from red cabbage. Use them to create a piece of art!

Learn More



[Why is Red
Cabbage Special?](#)



[Cabbage Inks
Essential Questions](#)

Such as ... will this stain my kitchen?

Subject:

Biodesign, Chemistry, Art

Age:

8+

Time:

Extract: 1 hour

Mix: 30 min



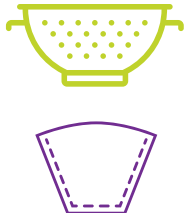
Create: 30 min-3 days

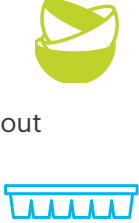




Key Concepts:

Pigment, pH, acids and bases, paint

Materials

You will need red cabbage, basic kitchen equipment to get the pigment out, and some supplies to create paints. We have included our favorite suggestions below to get you started, but use whatever you have on hand — be creative!

Pigment Extraction		
Kitchen Equipment	Red Cabbage (choose one)	Strainer (choose one)
<ul style="list-style-type: none"> Pot Stove Measuring cup [if chopping] Knife and cutting board 	<ul style="list-style-type: none"> ¼ head, chopped 8 oz bag, pre-shredded 	<ul style="list-style-type: none"> Pasta strainer Coffee filter Mesh sieve Cheesecloth 

Paint Supplies - Choose at least 1 from each category or experiment with a few!			
Mixing Containers (3-6)	Thickener (2-4 tbsp)	Gooey Ingredient (1-2 tbsp)	Acids and Bases (a pinch or dash)
<ul style="list-style-type: none"> Small bowls or dishes Plastic food storage containers Paper cups Jars or jar lids Upcycled takeout containers Ice cube tray 	<ul style="list-style-type: none"> Flour (any kind) Corn starch Diatomaceous earth 	<ul style="list-style-type: none"> Honey Corn syrup Maple syrup Vegetable glycerin 	<ul style="list-style-type: none"> Vinegar (any kind) Lemon juice Baking soda Dish soap Lime juice Shampoo Soda ash (washing soda)  <p> Nothing with bleach or ammonia!</p>

Instructions

Part 1: Extract your pigment (1 hour)

First, you need to get the pigment out of the red cabbage. You can do that by breaking open the cabbage cells with heat and letting the pigment escape into water.

- Place your chopped or shredded red cabbage in a pot.
- Add approximately 2-4 cups of water.
- Heat the pot on a stove until water is boiling.
 - The water will start to turn bluish-purple — that is your pigment liquid!
- Boil for 15-30 minutes to release the pigment and evaporate most of the water.
 - This will concentrate your pigment liquid. A final volume of about 1 cup is ideal for colorful paints!
- Turn off the stove and let everything cool.
- Pour the contents of your pot through a strainer and collect the purified pigment liquid in a container.



This process uses a stove and hot water, so ask an adult for help!



Pay attention so the liquid doesn't evaporate entirely and burn!

Part 2. Mix your own colorful paints (30 min)

To get vibrant paints, first create a batch of paint base and then split it up to change the colors.

1. Combine your paint base ingredients in a bowl and mix until there are no clumps.
 - Your paint base will be made from cabbage pigment, a thickener, and something gooey to help it flow.
 - Experiment with different combinations (or multiple ingredients!) to explore how your mixture changes.

2-3 tbsp	Cabbage Pigment Liquid
2-4 tbsp	Thickener(s) (flour, etc.)
1-2 tbsp	Goopy Ingredient(s) (honey, etc.)

2. Split your paint base into several mixing containers.
 - A shallow depth (<5mm) will help your paint dry faster.
3. Add a different acid or base to each container and see what colors appear!
 - Start with just a few drops or a pinch and mix well before adding more.



Activity Tips



[Getting the Most Color From Your Cabbage](#)



[Cabbage Inks Color Palette](#)

Mix your favorite hue.

Part 3. Create custom cabbage ink art! (30 min-3 days)

Your paints will be more flowing and vibrant after they dry out, but feel free to use them right away if you are excited to get started! Absorbent paper (like watercolor paper) often works best, but you can use any paper.

Painting Options	
Use Right Away	Make Reusable Watercolor Paints
<ul style="list-style-type: none">• Dip a paintbrush into your goopy mixtures and use them as they are!• Notice how the paint spreads. Is it runny or thick, light or dark? How is that affected by the consistency or color of the mixture?	<ul style="list-style-type: none">• Dry out your mixtures. This can take 3 or more days for very liquidy paints, but placing them by a fan or in the sun can speed things up.• Dip a paintbrush in water and swirl the wet brush on your dried paints. Once the brush picks up color, start painting!



Explore More

- **New paint recipes:** After using your first set of paints, make another batch with different ingredients or ratios. Can you get paints with different textures or colors?
- **Color changing art:** Dip your paintbrush in any acid or base (try vinegar and ½ tsp baking soda in 2 tbsp water) and use it on your dried art to magically alter the paint color!
- **Other vegetable inks:** Try extracting pigment from other fruits and vegetables such as beets, blueberries, or spinach — these won't all change color but they could broaden your color palette.

Get Inspired!



[Cabbage Pigment Ideas!](#)



[Cabbage Inks Tie Dye](#)

Learn how to make an eco-friendly fabric dye!

Share Your Results! Keep us posted about your progress on social media with **#TheTechatHome**.



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