

# Monthly 4-H Club Activity

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**COOPERATIVE EXTENSION**  
College of Agriculture, Forestry and Life Sciences



## Nature's Dyes

**Objective:** To extract natural dyes from materials at home. This activity promotes Reduce, Recycle and Reuse concepts, food science concepts, and sparks creativity.

**Age Range:** All ages (Note: Adult supervision required!)

**Hands-on Activity:** Create homemade dyes and color eggs.

**Life Skills:** HEAD = wise use of resources, critical thinking;  
HANDS = self-motivation;  
HANDS = personal safety.

### Introduction

Decorating and coloring eggs can be traced back tens of thousands of years ago, where people in the stone ages began the art form of decorating eggs by etching designs into the thick shells of Ostrich eggs. Later in history, many religions adopted the tradition of dying and decorating eggs to use as symbols during celebratory times. In the present day, eggs are often dyed in celebration of Easter throughout the world. Different countries have unique ways of decorating eggs, with some painting them and others even using wax to create a textured design.

Simple egg dying consists of depositing pigments onto the surface of an egg's shell. This works best by 1) roughing up the surface of the eggshell to get rid of its natural smoothness and shine and 2) using highly pigmented dyes for more intense colors. There is a molecular exchange that leaves the pigment on the surface of the eggshell when it is exposed to it and the more pigment that is available in the dye, the better the color deposition is.

Pigments occur naturally in almost everything! Our eyes and skin have pigment, flowers and leaves have pigments, even the foods we eat have pigments! Pigments are molecules that reflect certain wavelengths of light and absorb others, resulting in different colors. The most common pigments that are found in plants are called carotenoids. These pigments result in a range of colors in the plants they occur in, but most commonly they cause tissues to have yellow and orange coloration. Flamingos are pink due to their diet that contains carotenoid-rich foods, such as shrimp! As you may have guessed by now, these pigments can also be used to dye eggshells! Using vegetable scraps from your kitchen, you can create natural egg dye while also repurposing food waste!



Figure 1. Eggs dyed with common kitchen ingredients including beets (red), red onion peel (orange), turmeric (yellow), and mate tea (green).

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## Activity Materials

- A variety of vegetable and fruit scraps (try others!!!):
  - Purple cabbage (1 cup)
  - Beets (1 cup)
  - Yellow onion skins (1 cup)
  - Purple onion skins (1 cup)
  - Blueberries (4 cups)
  - Turmeric (2 tablespoons)
- White vinegar (1 tablespoon per dye)
- Water (1 cup per dye)
- Hard-boiled eggs (white, brown, or blue/green egg)
- Saucepan with lid
- Mesh strainer
- Small bowls or cups for dyes

## Activity Instructions

- 1.) Gather your food scraps. Place scraps and water into a saucepan and bring to a boil. NOTE: Adults should supervise all stovetop activities.
- 2.) Reduce heat and simmer for at least 15 minutes (longer if color is not deep enough). Remove dye from heat and let cool.
- 3.) Strain scraps out of the mixture so that just the dye remains.
- 4.) Add white vinegar to each dye to roughen the surface of the eggshell to allow for better color deposition.
- 5.) Submerge eggs in dye for at least 30 minutes.
- 6.) For more intense color, leave eggs for a few hours or experiment with multiple “dips” in the dye, drying eggs in between each dip.

## Reflection

What would you change if you did this activity again? What other ingredients could you try next time? What are other ways we can reuse or repurpose kitchen scraps, including eggshells?

## Conclusion

Extracting natural pigments and using them to dye eggs is a fun way to experiment and spark an interest in STEM and food science. It also opens the door to explore historical egg decorating traditions across different cultures!

## Resources:

Burns, T. A. 2017. Spring Care Baskets. We CU Volunteer. Monthly Activity Idea.  
<https://www.clemson.edu/extension/4h/get-involved/volunteer/files/2017april.pdf>

Tiffany. 2020. Run Wild My Child. How to Make Natural Dye for Easter Eggs.  
<https://runwildmychild.com/natural-dye-easter-eggs/>



Figure 2. Tern eggs in the nest, showing unique color and pattern found in wild bird eggs when compared to chicken eggs.



Figure 3. Shredded purple cabbage, ideally shredded is best for making dye.



Figure 4. White chicken egg dyed with yellow onion peels.

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