



MAKER ED PRESENTS

LEARNING IN THE MAKING

HOW TO MAKE NATURAL PAINTS

INTRODUCTION

The natural world is filled with vibrant color! Our very own environments hold many valuable tools for creation. Would you believe me if I told you that in today's project you are going to make your very own paint pigments? Today's project saves money and the environment! In this project, you will learn how to make paint from food items that could be found in a refrigerator or pantry.

Creating your natural paints is just the beginning. Once you have your colorful paints ready to use, you will use these paints to create patterned paper. Patterned paper can be used for collages, cards, and more!

In this project you will explore your identity as an artist and as a scientist. Did you know that scientists and artists are actually a lot more similar than they are different?

Can you think of some ways that scientists and artist are alike?

IN THIS ACTIVITY YOU WILL:

- Extract pigments from natural objects around you.
- Manipulate the form of natural objects.
- Create patterned paper to be used in new ways like cards, collages, wrapping paper, and more!



Tools & Materials of Making

Get creative and use whatever materials you have available.

Here are some suggestions to start with:

- **Cooking Materials:** Small Pot + stove, Microwave (if no stove), Small bowls/cups, Spoon
- **Food Materials:** Red cabbage, Spinach, Berries (fresh or frozen), Tea (black or herbal), Coffee, Vinegar, Baking soda
- **Texture Materials:** Paint brushes, Sponges, Q-tips, Leaves, any other interesting textured objects
- **Paper:** White paper of varying thicknesses (watercolor paper if you have it)
- **Tools:** Scissors, Pens, Pencils, Markers, Paper



Subject

Chemistry
Art



Standards

NGSS-PS1.B:
Chemical Reactions

NGSS-MS-ETS1-4:
Engineering Design



Grades

K-2nd
3-5th
6-8th
9-12th



Key Terms

Boil
Extraction
Concentrated
Diluted
Pigment
Manipulate
Synthetic
Acid
Base



Watch the video here:
<https://bit.ly/NaturalPaints>

ACTIVITY INSTRUCTIONS



MAKING NATURAL PAINT PIGMENTS

Some food materials are easier to *extract*, or take, color from. Foods like coffee, tea, spinach, and berries are easy foods to extract color from.

HINT: Food materials can be scraps and leftovers. Instead of throwing them away, use them for paint!

- 1 Gather 2-3 food materials (from list).

- 2 Safely and carefully, chop up your foods. You can also rip them into pieces or smash them up.

- 3 Safely and carefully, heat up your water. Get some hot water near boiling. You can do this on the stove, in an electric kettle, or in the microwave. (Make sure you have adult supervision).



- 4 Put your food materials in your bowl and add about ¼ hot cup of water (the ratio of raw material:water is 1:2) Once you have it all in the bowl, grab a spoon or something to use to break the material into smaller and smaller pieces for about 30 seconds.

- 5 Test pigment by dipping a strip of paper into the pot Finally, strain your pigment by separating the water from the tiny pieces of food scraps using a spoon or strainer. And let it cool down.

What does it look like and smell like before and after?



Helpful Tip:

Pigments are often extracted by increasing the surface area. We do that by breaking the thing up into lots of pieces. The more edges we have, the more surface area we have. Then we add some hot water to break open the cells even more. Once it cools, you can strain it if you want. You can use a strainer, or use a fork or spoon.



Extra Credit!

Turn red cabbage into two different colors!

1. Boil cabbage in 2 cups of water
2. Separate pigment into two different cups.
3. Add an acid like lemon juice or vinegar to cup #1
4. Add a base like baking soda into cup #2.

What color does a base turn your red cabbage pigment? What color does an acid turn your red cabbage pigment?



Created in collaboration with:
Aáron Heard & Annalise Klein

For more resources, visit us:
makered.org

MAKING PATTERNED PAPER

Now use your pigments!

1. Find a couple different objects to use for painting (sponge, paint brush, plastic bag, q-tip, leaves, flowers)
2. On a white piece of paper, make patterns with your pigments. Try repeating patterns, random markings, etc, and fill up the whole page.
3. Let dry.
4. To make your designs darker, add more layers of pigment. Let each layer dry before adding the new one.
5. Finally, cut up your patterned paper to make collages, cards, paper weaving, etc... Get creative!



REFLECT

- Who are you grateful for?
- Can you create a pattern that reflects that person or what you are grateful to them for?



Example: I am grateful for my grandmother because she taught me how to garden. I will make my pattern a design of plants and garden tools.



Share your project! @MakerEdOrg #MakerEdAtHome #NaturalPaints

