

Garden Colors: A Natural Dye Activity

Essential Question(s):

Why might plants have so many various colors?

What purpose may these colors have for plants?

How do synthetic and natural dyes differ?

Background Information:

Plant pigments have been utilized throughout various cultures in human history. Textile dyeing dates back to the Stone Age. It is believed that cave paintings made with plant pigments were created as early as 15,000 BC. The great civilization of Egypt used dyes as early as 2000 BC.

Additionally, the British “Redcoats” from the American Revolutionary War used plant pigments to color their famous uniforms.

Green is the most obvious color seen on plants. This comes from chlorophyll in the leaves that is used to capture the sun’s light to convert to energy. This is then stored as food for the plant. Other plant colors may be used to attract animals to eat their fruit and spread their seeds, attract pollinators, or even possibly protect them from diseases!

Natural dyes are not as bright as man-made, synthetic dyes (which came into use in the late 1800s). Natural dyes have a mixture of pigments, but they still create beautiful earth tones. Many factories producing synthetic dyes do not perform proper waste disposal, so the dyeing process is a large source of pollution to waterways.



Objectives: Learners will...

- 1) Discover the many colors plants can provide
- 2) Understand the difference between synthetic and natural dyes
- 3) Formulate questions on different impacts of synthetic versus natural dyes

Location: Somewhere outside where the working surface will not be stained

Supplies:

- Various plant parts from around the house or garden
- 1-pint glass jars
- Cheesecloth or sieve
- Distilled water (or water that has set out overnight)
- Plastic Wrap
- Alum
- Paint brushes
- Paper or fabric
- **Optional:** Gloves/newspapers to lay out (to keep from staining hands and working surface)

Standards:

- SKL1-b
- SIL1-a
- SS1H1-b
- SS2H2-a

Preparation:

*Note that the dye must sit for several days before use.

Procedure:

1. Discuss background information about the history of dyes, the use of colors in plants, and the difference between natural and synthetic dyes.
2. Allow children to help collect and cut up plant materials such as leaves and flowers and crush any berries.
3. Place in separate jars with distilled water within one inch of the brim (double the amount of water to plant material), cover the lids with plastic wrap, and place in a sunny area for several days.
4. After sitting for several days, strain the water through the cheesecloth or sieve, and stir in $\frac{1}{4}$ teaspoon Alum to help set the dye. (Can do this without Alum, dye will just be weaker.)
5. Pass out paper or fabric for children to paint on, and allow time for painting.

Discussion/Assessment:

- How are the natural dyes different from the synthetic dyes used to color most of our clothes?
- What does color add to our lives?
- How do you think early humans discovered natural dyes, and what do you think they used them for?
- Did the plants that you compared to the dyes create a color you would expect?