

Cochineal: The Perfect Red To Dye For

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Grade Level	4
Duration	3-4 class periods

National Standards	AZ Standards	Other Arizona Standards
GEOGRAPHY Element 2: Places and Regions 4. The physical and human characteristics of places Element 4: Human Systems 10. The characteristics, distribution and complexity of Earth's cultural mosaics	ARTS VA.CN.10.4 Create a work of art that reflects community or cultural traditions. ELA Reading Key Ideas and Details 4.RI.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	GEOGRAPHY Human-environment interactions are essential aspects of human life in all societies. 4.G2.1 Compare the diverse ways people or groups of people have impacted, modified, or adapted to the environment of the Americas. HISTORY The development of civilizations, societies, cultures, and innovations have influenced history and continue to impact the modern world. 4.H1.1 Utilizing a variety of multi-genre primary and secondary sources, construct historical narratives about cultures, civilizations, and innovations in the Americas.

Overview

Red is one of the two top favorite colors of all people. It is the most popular color used on flags. It is the international color for stop. It can symbolize passion, violence, anger and adventure. Red dye was expensive and sought after even in ancient days. Its intense color can come from crushed insects: the cochineal.

Purpose

In this lesson, students will explore the process and the materials used in natural, artisanal dyeing for centuries in Mexico and how a Western Hemisphere insect, the cochineal, once created the world's most desirable color.

Materials

- Steps to Dyeing with Cochineal PowerPoint (for teacher use)
- Cochineal Farming in Oaxaca, Mexico PowerPoint
- Cochineal: A Study in Scarlet Student reading
- Graphic Organizer for Four Door Book
- Four Fold Door Book by Dinah Zike example

- World Map centered over Atlantic
<https://geoalliance.asu.edu/sites/default/files/maps/World-at.pdf>
- 18 x 12 construction paper to create Four Door Book
- Glue
- Scissors
- Highlighters
- Research Report: Cochineal: The Red to Dye For rubric
- Dyeing materials
 - Distilled water
 - Alum (spice section in grocery store)
 - Gloves
 - Hotplate
 - Mortar and pestle or rolling pin and a strong plastic bag to grind the cochineal
 - 5 grams dried cochineal
 - 3 ½ oz sheep wool in a tied hank
 - Coffee filters
 - Stockpot for dyeing
 - Tape
- Art Project
 - 3 ½ oz sheep wool undyed and wound
 - Simple weaving, crochet, friendship bracelet or other fiber project ideas

Objectives

Chochineal: The Perfect Red to Dye For

The student will be able to:

1. Produce a natural dye.
2. Describe the dyeing process in cultural and historical context.
3. Create an art project.

Procedures

Prerequisite Skills: Students should have knowledge of European exploration in the Americas after 1492.

Teachers Prior to the Lesson:

1) *Acquaint yourself with this file on dyeing cochineal.*

<https://botanicalcolors.com/2014/06/10/dyeing-for-dummies-the-wonders-of-cochineal/>

2) *View the Dyeing Cochineal PowerPoint that shows how to dye the examples.*

3) *Purchase the materials and gather cactus pads.*

4) *Mordant the wool (boil the wool with the alum that will make the dye fix) at home before you dye the wool at school.*

SESSION ONE

1. Bring in cochineal infected cactus pads and ask students what the white stuff might be. Is it a plant, animal, or mineral? Show a sample of dried cochineal. Ask for any ideas as to what it might be.
2. Explain that Europeans in the 1600's thought they were seeds, peppercorns, or worms. But because of this substance/thing, Spanish were able to amass a fortune from Mexico--second only to silver.
3. Smash a bit and show the students the blood-like stain on your hand. Ask the students, what do they think this red coloring was used for that would make this substance/thing worth its weight in gold?
4. Explain that they are going to travel to southern Mexico to learn more about cochineal. Show Cochineal Farming in Oaxaca, Mexico PowerPoint.
5. Distribute the map of the world. As a whole group, have students identify Mexico, Peru, Spain, England, Holland, France, Italy, United States and China as you point them out on a wall map or on a world map projected. They will also label the following civilizations: Maya, Aztec and Inca. Have arrows for the trade route. From Mexico to Spain. From Spain to England, Holland, France, Italy, United States and China.

6. Collect or have students put in a safe spot!
7. Distribute the reading, *Cochineal: A Study in Scarlet*. Read together as a class highlighting important information. This reading will be used for the next class period. Collect or have students put in a safe spot!
8. Ticket Out: What is cochineal and why is it important?

SESSION TWO

1. As you demonstrate how to dye wool, students will list the steps on notebook paper or have one student write the steps on the white board.
2. Once the dye bath is simmering, distribute the Graphic Organizer for Four Door Book. Using the reading from previous session, students are to find four important facts for each heading. They may work in pairs. Remind them to write neatly as this will be made into a booklet later on.
3. As a whole group, discuss what the facts under each heading could be so each student has a completed graphic organizer.
4. Ticket Out: Students will turn in work from today.

SESSION THREE

Prior to this Session, teacher should view the directions that shows how to make the Four-Door Book (Dinah Zike) included in the lesson. You might also project this document to help students follow along on what to do.

1. Show students how to fold the construction paper to a shutter fold, then hamburger fold, and then cut the pages. (p1)
2. Have students take out their Graphic Organizer for Four Door Book from the previous day....or give them a second copy so they can copy their work so it is very legible. Have them neatly cut the five sections (Cochineal, Dyeing with Cochineal, Origins, Trade, and Tidbits) apart. (p2)
3. Instruct students to write the major heading on the front of the construction paper flaps and glue the facts under the page. They will then glue the map from Session One and Tidbits on the back. They will also tape or glue a sample of the cochineal dyed yarn to the back after the yarn is dry. (p3-5)

SESSION FOUR (optional)

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Art projects could be done in conjunction with the art teacher. Show examples of what students could make with the yarn. Have a gallery show!

Write a research report giving the steps in farming cochineal or in dyeing with cochineal and why chochineal is/was important in the Americas and Europe.

Assessment

Geography

Students will score 80% or higher of the map correctly identifying the locations specified.

ELA and Geography

Use the Research Report: Cochineal: The Red to Dye For rubric to grade a resulting report on cochineal. Mastery will be scoring 3 or higher on each category.

Extensions

Have students make simple cardboard looms to learn to weave.

Have students make additional dyes using natural products

Have students bring in examples of cochineal dye in commercial foods and other products

Have students use natural dyes to design other art projects and enter them in your state fair.

Sources

Greenfield, Amy. *The Perfect Red*. New York: HarperCollins, 2003.

Smithsonian Institute

<https://www.smithsonianmag.com/innovation/bug-had-world-seeing-red-180961590/>

Cochineal Dye

<http://www.cochinealdye.com/html/cochineal-dyeing.html>

The Colonial Williamsburg Foundation

<http://www.history.org/foundation/journal/summer12/dye.cfm>

University of Oregon

<https://blogs.uoregon.edu/mesoinstitute/about/curriculum-unit-development/stem/ethnobotany/cochineal/>

Grand Canyon River Guides

<https://www.gcrq.org/bqr/8-2/bug.htm>

Gardening Know How

<https://www.gardeningknowhow.com/ornamental/cacti-succulents/scgen/cochineal-scale-on-cactus.htm>

Brush Off the Dust! History Now!

<https://erikafranz.wordpress.com/tag/cochineal/>

Metropolitan Museum of Art

<https://www.metmuseum.org/metmedia/video/metkids/metkids-create/weave-on-a-mini-loom>

Botanical Colors

<https://botanicalcolors.com/2014/06/10/dyeing-for-dummies-the-wonders-of-cochineal/>

Rubistar

<http://rubistar.4teachers.org/index.php?ts=1534531307>

NY Times

<https://www.nytimes.com/2017/11/27/arts/design/red-dye-cochineal-treasure-mexico-city-history>