

LESSON PLAN

Lesson Title: Deep Roots: Indigo in South Carolina
Grade Level: 3rd - 12th grades, adaptable
Length of Lesson: Two 90-minute Class Periods

Lesson Description:
Students will study the antebellum history of indigo in South Carolina and the use of this valuable dye to create rich blues. Students will explore the unique science behind the indigo vat and dye fabric using resist techniques.

South Carolina State Standards:
Social Studies: 3-1, 3-2, 3-4, 4-6, 8-1, 8-4, USHC-2
Visual Arts: VA.CR.2, VA.CR.6, VA.CR.7
Science: 3-8.S.1, 3-6.L.5

- Instructional Objectives:**
- Students will learn the history of indigo in South Carolina.
 - Students will explore the basic science used to create blue indigo dye.
 - Students will design a resist pattern on fabric and dye their cloth in a prepared indigo vat.

Vocabulary:

Indigo	Cash Crops	Oxidation	Resist
Plantation	Antebellum	Eliza Lucas Pinckney	Vat Dye

Florence County Museum Connections:
Cotton Dress dyed with Indigo, Pee Dee History Gallery
Indigo (Persicaria Tinctoria), Museum Courtyard

Materials:
12 x 12 piece of white cotton muslin for each student
Jacquard Indigo Dye Kit
5-Gallon Bucket
Rubber Gloves (one set of disposable per student or several reusable pairs shared)
Water
Objects for Resist: Craft Sticks (Various Sizes), Rubber Bands, Marbles, Clothespins

- Questioning:**
- Why do you think the growth of indigo was important to the economy of South Carolina?
 - What is a dye? How do you think dyes are made? Indigo is different from many traditional dyes. It is what we call a vat dye.

- Instructional Procedures:**
- Discuss the origins of indigo agriculture in South Carolina.
 - Include information about Eliza Lucas Pinckney, her father, Lt. Colonel George Lucas, their home at Wappoo Plantation, and her husband Charles Pinkney.
 - Discuss the unique properties of the indigo plant and the methods used to make indigo into a soluble dye.
 - Include information about extracting dye from the plant, creating an indigo vat, and oxidizing indigo-dyed materials.
 - For Indigo Dyeing**:
 - Creating a resist design on fabric:
 - Instruct students to fold their fabric square using the accordion fold. The folded fabric should be in a long slender strip, similar to a paper fan.
 - Students will design and create a resist using craft sticks, marbles, rubber bands and clothespins. Detailed instructional video can be found on our website: flocomuseum.org/pee-dee-connections-lesson-supplements
 - When students have finished designing and creating their resist, they are ready to dye their fabric.
 - Soak fabric in clean water for 10-30 minutes prior to placing in the indigo vat. Wring out slightly so that no water is dripping from fabric.
 - Slowly submerge fabric in the indigo vat. Do not drop the fabric! You do not want it to touch the bottom of the vat. Gently work the fabric through the vat with your gloved hands. After 3-5 minutes, remove the indigo dyed cloth.
 - When your fabric is removed from the indigo vat it will be bright green. Watch as the magic of oxidation turns the indigo from green to blue.
 - Allow your indigo dyed fabric to dry fully before washing.

**It may be best to complete the indigo dyeing process outdoors. Indigo in a properly formed vat will stain clothing, hands and floors. Best results will be achieved on a warm day with fabric allowed to dry outside on a rack, line, or directly on the ground.

- Closure and Critique:**
1. How is the process of adding color to fabric different from the way that you obtain colored fabric or clothing today?
 2. Before this lesson started, did you know that blue jeans were dyed with indigo? Did you know that plants could be used to create color on fabrics? What other plants do you think would make an interesting dye?



Florence County Museum
111 West Cheves Street
Florence, SC 29501



PEE DEE CONNECTIONS

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ABOUT THIS POSTER

Indigo is a blue pigment produced by a variety of plants grown around the world. The dye, most commonly known in dyeing blue jeans, was a highly prized material in the early colonial days. The cultivation of indigo-producing plants and production of indigo dye became a major economic trade in antebellum South Carolina.

In 1738, Lt. Colonel George Lucas, of the British Army, moved his family from their sugarcane plantations in the British West Indies, to land inherited by his father near Charleston, South Carolina. His sons, Thomas and George, were sent to London to further their education, but his wife, Ann, and two daughters, Eliza and Mary, accompanied him to their new home at Wappoo Plantation. Shortly after their arrival in South Carolina, Ann Lucas died and in 1739, Col. Lucas was called to military service in Antigua, leaving Eliza with the management of their three plantations and the care of her sister.

From Antigua, Col. Lucas sent Eliza various seeds for trial on their plantations, including Indigo (*Indigofera Suffruticosa*). After several years of trial and error, Eliza produced a successful indigo crop. In order for Eliza to perfect the process of turning the indigo plant into dye, Col. Lucas sent an expert indigo-maker from the island of Montserrat. Eliza would use her indigo crop from 1744 to share seeds with other plantation owners, increasing the volume of indigo dye exported from South Carolina 25 fold. Indigo became second only to rice as South Carolina's most profitable cash crop, accounting for more than one-third of the total value of exports.

Producing indigo dye from the indigo plant is a laborious process with many steps. When ready to harvest, stems of leaves from the Indigo plant would be cut and bundled. These bundles would be fully submerged in a large vat of water for several days to allow fermentation to aid in removing indigo dye's precursor, indican. Removed from the leaves, indican changes form to indoxyl, the compound that will become blue indigo dye. At this point, stem bundles were removed and discarded. To separate the indoxyl from the water it was contained in, lime was added and the vat was stirred to introduce oxygen, allowing the indigo to sink to the bottom. Water was carefully skimmed off of the settled blue pigment and pigment was left to dry. The resulting indigo powder could be packaged and sold for use as indigo dye.

*For additional information on dyeing with indigo, please visit: flocomuseum.org/pee-dee-connections-lesson-supplements

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Florence County Museum | 111 West Cheves Street | Florence, South Carolina | 843.676.1200 | flocomuseum.org

Tuesday - Saturday: 10:00 am - 5:00 pm, Sunday: 2:00 pm - 5:00 pm



Empire-style dress
c. 1812
Gift of Mrs. J.M. McIntosh
2010.6.30