

Introduction to Natural Dying



Objectives: Explore the world of Natural Dying

Projects: Dye one 20g (49 yd) skein DK weight of BFL yarn for each of the 5 colors, mohair locks, one cotton tote, one silk scarf in the color of your choice, one natural fiber (not man-made fiber content) *item that you will bring** to exhaust the dye baths.

Description: For thousands of years, humans have experimented with color - from cave paintings to tapestries and royal garments. In this class, we will dip our toes into the ocean of color that can be produced with naturally occurring, renewable resources, from plants and animals.

You will learn what items are most suitable for natural dying, how to clean and prepare your objects for dying, the basics of calculating the amount of dye required for the desired color saturation, and many references for continuing your journey if you choose to do so.

All necessary items will be supplied.

Maximum class size - 15

Class fee: \$150, includes material fees

Items brought from home should be a natural fiber like cotton, wool, alpaca, silk. Manmade fibers like nylon, do not take natural dye as well. **Examples: Cotton shirt/ t-shirt, socks, clothe, towel; yarn you would like to over dye a different color, fiber for a craft project

Introduction to Natural Dying

When: May 30, 2024

Time: 9am to 3pm

Where: Swine Pavilion, Missouri State Fairgrounds

2503 W. 16th St., Sedalia, MO 65301



Class description: In this class, we will dip our toes into the ocean of color that can be produced with naturally occurring, renewable resources, from plants and animals. You will learn what items are most suitable for natural dying, how to clean and prepare your objects for dying, the basics of calculating the amount of dye required for the desired color saturation, and many references for continuing your journey if you choose to do so.

Projects: Dye one 20g (49 yd) skein DK weight of BFL yarn for each of the 5 colors (purple, light blue, yellow, orange, pink), one cotton tote, one silk scarf in the color of your choice, one natural fiber (not man-made fiber content) **item that you will bring*** to exhaust the dye baths. **Examples:** Cotton shirt/ t-shirt, socks, clothe, towel; yarn you would like to over dye a different color, fiber for a craft project.

All necessary items will be supplied.

Maximum class size - 10

Class fee: \$150, includes material fees

Introduction to Natural Dying



Hook & Shuttle Palmyra, WI

Teacher: Brandy Bohman

Introduction to Natural Dying

Teacher: Brandy Bohman

Agenda:

Housekeeping

Safety

Weigh goods brought to class

 Soak stuff by fiber type

Protein fibers

Cellulous fibers

Dye stuffs and references

Mordants and modifiers

Steps to dying

WOG calculations

Preparing a dye bath (cochineal and/or annatto)

Dye objects

Wash objects

Exhaust dye baths

Disposing of bath

Safety

We will be working with hot liquids and fire. It is possible that you may be splashed with dye and it will not come out of your clothing.

Any dyeing equipment should NOT be used for food preparation afterward.

Safety PPE (Personal Protective Equipment):

- Safety glasses will be issued if you do not have prescription glasses.
- Rubber gloves
- Pot holders
- Plastic apron
- Tongs
- Long handled spoons

Preparing Fibers for Dyeing

Weight of Goods

Weight goods when dry. If you weigh in ounces, calculations are in ounces. If you weigh in grams, calculations are in grams. Two decimal places are preferred.

Use a kitchen scale that is appropriate for the weight. Remember to tare your scale before weighing your goods.

After recording the weight of your items, we will soak them in warm water with just a few drops of original Dawn. They do not need to be soapy or sudsy, the detergent is a surfactant to assist with wetting.

WOG: _____

Protein fibers

Common protein fibers used in dyeing are wool, silk, mohair, and camel. These fibers are commonly found as garments/clothe, yarn/thread, or loose fiber. Protein fibers have overlapping scales on the surface, making them sensitive to fluctuations in temperature.

****When preparing fibers, only go up** in temperature and do not exceed 160 degrees F. High temperatures will cause the fiber to become brittle and break. Hot to cold will cause felting.

Chemical structure of wool fiber:

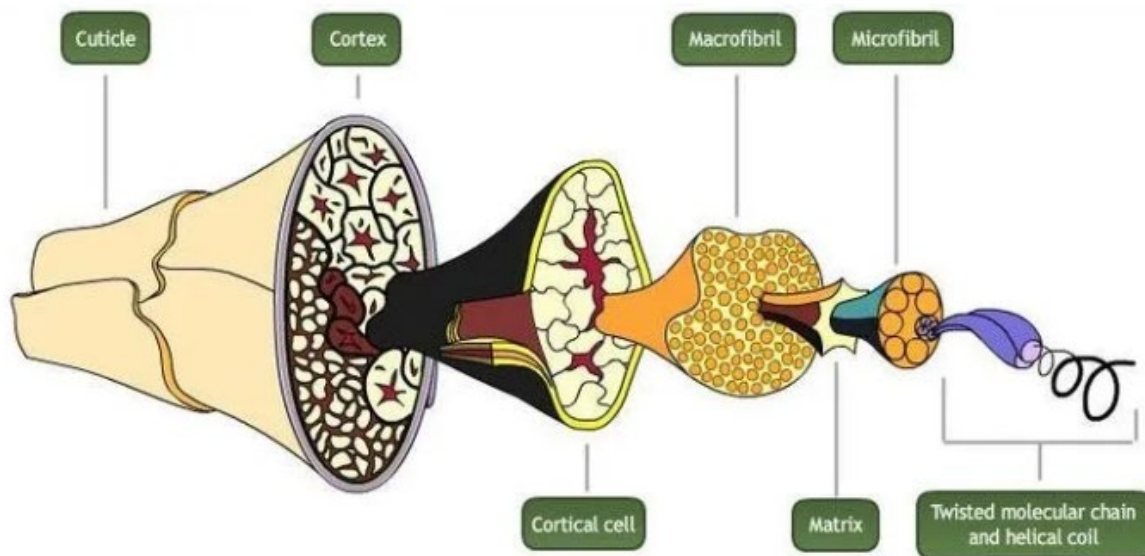


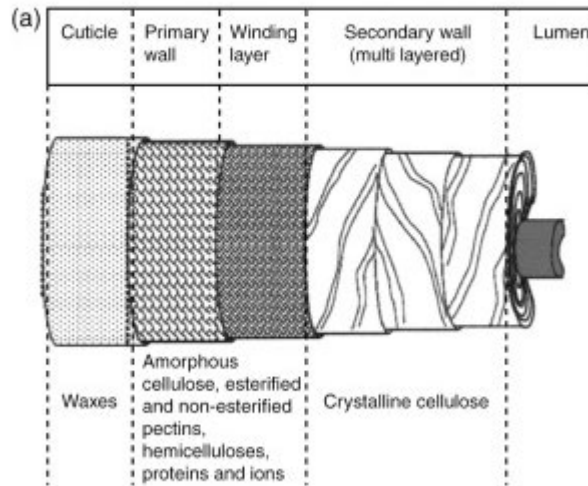
Figure 1: Chemical structure of wool

[Different Types of Protein Fibers with Properties and Uses - Textile Learner](#)

Cellulous fibers

Plant fibers are known as cellulous. The fiber structure is segmented and smooth. Cellulous fibers can take more heat, including boiling.

2.1. Structure of cotton^{9,10}



[Cotton Fiber - an overview | ScienceDirect Topics](#)

Important facts about protein fibers vs cellulose fibers:

Dye stuffs

We call the items we use to transfer permanent color “dye stuffs”. Why? The short answer would be that this term encompasses many different specifics. You could use the leaves, stems/bark, flowers, fruits, seeds, or roots from the same plant and get different colors. You can also use insects or mollusks. Hence, “stuff” seems to be appropriate.

You can get some color from most green plants due to the chlorophyll in the leaves and stems. You can get pinks and yellows from beet juice. However, NOT all things that turn something a color will be light and color fast. There are many books out there that give you the information you need to use the “tried and true” dye stuff that will give you a light fast (meaning a certain amount of UV resistance) and wash fast (a color that will hold up to repeated washing).

We will be using the following:

Name	Description	Dye Stuff	Color
Logwood	tree with many trucks, part of legume family	wood chips	Purple or Navy
Cochineal	Scale insect that lives on nopal catcus across Americas	Insect	Pink or red
Yellow Onion	Papery outer layers of dried skin from yellow onion	Outter layers	Yellow
Annatto	Seeds have a sticky red pulp	Seeds	Orange
Saxon Blue	Pre-vatted Indigo	extract	Light Blue

The color Saturation we would like to achieve with each of these are:

Purple: _____

Pink: _____

Yellow: _____

Orange: _____

Light Blue: _____

Mordants and Modifiers

Mordants are used to assist with dye penetration and are specific to fiber type. The most commonly used mordant for wool is *aluminum potassium sulfate (alum)* and the most commonly used for cotton is *aluminum acetate**. Both are white powders, one can be used for cooking, the other cannot. Make sure containers are labeled!

Examples of natural mordants: rhubarb leaves (oxalic acid), oak galls (tannin), copper sulfate

**Aluminum acetate* is NOT “alum” bought in the grocery store. It can be used topically for skin irritation (when diluted) and can be found as a preservative in some food.

Modifiers are used to shift color and can be applied before, during, or after dying. Some modifiers can also act as a mordant and will shift color as well as help dye adhesion.

Examples of modifiers: iron, copper sulfate, rhubarb leaves

Modifiers can also be used in the dye bath to shift pH which will change the color.

So many possibilities!

Recipes on page 12

Steps to Dying

The following steps can be used to prepare and dye any fibers. Make sure you change the recipes according to the type of fiber you are dying.

1. Weigh your goods to be dyed when they are dry
2. Record the weight of your goods by fiber type
3. Wet your fibers by covering your goods with warm water for a minimum of 2 hours or overnight.
4. Mordant your fibers according to fiber type. Fibers can be used immediately or dried to be used at a later date. If you will be waiting more than 48 hours to dye, it is recommended to dry your goods and re-wet before dying.
5. Use a recipe to prepare your dye bath based on the degree of saturation you have chosen. You may need to calculate your dye stuff based on WOGs.
6. Create your dye bath. (remove dye stuff if recommended)
7. Bring your dye bath to the correct temperature for dying your fiber type. You may need to let the dye bath cool if dying protein fibers.
8. Following the recipe for the type of natural dye you have chosen, place your goods into the dye bath and hold them at the appropriate temperature for the time recommended. For deeper colors, it may be recommended to leave goods cool overnight in the dye bath.
9. Remove goods from the dye bath and run under water to remove excess dye. Remember that protein fibers may need to cool off before washing so you do not felt them by going hot to cold.
10. When water is mostly clear, add a mild soap, with a neutral pH, to help remove excess dye.
11. Rinse until your water is clear.
12. Remove excess water by squeezing or spinning in an extraction machine
13. Exhaust your dye bath if you choose by dying additional items. The color may lighten quickly if you have not chosen a saturated color.
14. Neutralize your dye bath. Check the dye bath with a pH strip. 7 is neutral and may be poured down a drain. If the number is lower, add baking soda. If the number is higher, add white vinegar. (Check and adjust until you get a 7)
15. Dispose of your neutral dye bath by dumping it down the drain or in an appropriate place outside.

Mordant recipe

Protein fibers – aluminum potassium sulfate (alum)

1-1/2 teaspoon for 100 g (4 oz) WOG (7%)

4 gallons of water per 1 lb of goods

Cellulous fibers

¼ c hot water

2 teaspoons aluminum acetate for 100 g (4 oz) WOG

4 gallons of water per 1 lb of goods

References

Websites:

<https://botanicalcolors.com> - shop supplies and read articles about various techniques

[Natural Dyes- MAIWA](#) - shop dye stuffs and read many articles about dying

www.woad.org.uk - All About Woad website from the UK

[Experimenting with Natural Dyes - A Beautiful Mess](#) - “down and dirty” natural dying for crafts (also a cool website for crafting)

Books:

Wild Color by Jenny Dean

The Modern Natural Dyer by Kristine Vejar

The Handbook of Indigo Dyeing by Viven Prideaux

Stuff to bring for class - BLB

Wash proof/permanent marker

Waterproof tags

Dye

5 thermometers

5 containers

Modifiers

Mordants

Scale

SS tools

Propane stove?

SS pots (X3)

2 crock pots

Housekeeping:

Bathrooms

Lunch

Safety: aprons, glasses, gloves, pot holders