

Natural Dyes

Time: 1 hour

Purpose

To find out how to colour textiles using natural dyes from sources such as flowers and berries.

Background to the task

Dyeing from natural sources is the oldest way of colouring textiles. Natural dyes can give subtle soft colours through to the very brightest of colour to yarn and fabric. The first colours used to dye fabrics were obtained from animal and vegetable sources. Cochineal pink from a South American beetle, yellow from flowers such as saffron and marigolds, sepia brown was obtained from cuttlefish, green from mosses and lichens, and browns and blacks from logwood bark.

Colouring fabrics with natural dyes produces amazing colour combinations, depending upon the amount of natural product, fibre being dyed, concentration of the dye, time spent in the dye bath, and mordant used. One batch of onionskins for example can produce shades of yellow, through to orange and brown, all in a variety of intensity. No batch of colour is ever the same, and you can never make the same colour again, no matter how hard you try.

Almost anything from nature can be gathered to produce colour e.g. flower heads, twigs, stems, roots, berries, fruit, herbs and vegetables (see the table at the end for a list). Many varieties of colours can be obtained from such natural dyes, but these colours are not very colourfast. They fade in sunlight and wash out. Because they are difficult to collect, they are also uneconomical for dyeing large amounts of fabric.

A mordant allows dyes to be taken up readily, evenly and permanently by fibres, and are usually placed in the dye bath before dyeing takes place. The most common chemicals used as a mordant are alum, chrome, iron and tin. These four mordants have the following general rules, but as with all natural products these do not always follow!

Alum – adds brightness and fixes the colour

Tin – enhances colours especially red and yellow

Chrome – gives a brownish tint to the colour

Iron – darkens the colour.

Sustainability of these chemicals should also be considered for the purpose of this project.

New Words- Terms and definitions:

Colourfast – how permanent the dye is on the fabric

Dye – the liquid containing colour used for dyeing

Dye bath – the vessel used to dye in

Mordant – chemical, which acts as a fixing agent.

Intensity – how deep the colour is on the fabric

Shade – the degree or depth of colour, usually by adding some black

Carrying out the task

- You can work in groups of two or three
- Your teacher will provide you with equipment and you can source some of the ingredients from home.

You will need:

Heat source (e.g. hob, Bunsen burner and tripod)

Old saucepan

Old wooden spoon

Rubber gloves (Check for allergies in the class, or buy hypoallergenic)

Apron (or old shirt worn backwards)

Sharp knife

Chopping board

Teaspoon

Measuring jug

Small bowls

Mixing bowl

Pestle and mortar

Newspaper

Tongs

Sieve

Permanent pen, biro, or coloured thread and sewing needle

Samples of fabric (e.g. cotton, cotton/polyester, linen, wool) the fabric must be clean and free from grease or dirt, which stops the absorption of the dye.

White paper

Access to plenty of tapped water

Ingredients.

Natural ingredients of your choice see table (e.g. red cabbage, onion skins, blackberries, and beetroot).

Mordants of your choice (e.g. cream of tartar, vinegar, and salt).

Water

Method.

1. Wear gloves and apron at all times. Make up the mordants – in one small bowl measure in 125ml warm water and 1 teaspoon cream of tartar. Stir until dissolved. In another small bowl measure 125ml of vinegar. In the third small bowl measure 125ml hottest tap water and add 50g salt, stir until dissolved.
2. Place a piece of cotton fabric and a piece of cotton/polyester fabric in each bowl. You should be able to identify each sample in the dye bath (e.g. V – vinegar, S – salt, T – cream of tartar, permanent pen or biro works well, small hand embroidery stitches would be very sustainable). You will have two pieces of fabric left over. Leave the samples in the mordant solutions while you make up the dye solution.
3. Cut/crush the ingredients of your choice into small pieces.
4. Place in a saucepan, and cover with cold water.
5. Bring to the boil and simmer until a good colour is reached – probably about 15 minutes, a darker colour is obtained the longer it is simmered for. Simmering of some ingredients may take a few minutes to many hours. In general when the colour of the dye bath ceases to deepen the process of extracting the dye is complete.

6. Strain the liquid using a sieve into a large mixing bowl. Wrap the remaining ingredient in newspaper.
7. Dampen the two left over samples of fabric with warm water (your control).
8. Immerse these fabric samples in the dye bath and stir with the wooden spoon.
9. Squeeze out the mordant solution from the other samples and place these in the dye as well.
10. Remove the samples and rinse under clear cold water until the coloured water 'runs clear'. Leave to dry on white paper. Iron while still a little damp for ease of crease removal.

Mount and display your samples showing the initial 'raw' ingredients and outcomes.

Extension activities

Now that you have learnt the basic method of natural dyeing there are many experiments you can do and outcomes to follow. Continue to experiment in your own way and see what happens with other fibres, mordants, and dyestuffs, use the fabric that you dye to make some of the following:

- Tie Dye an existing product to revamp it
- Weave a rug with dyed lengths of dyed fabric
- Dye samples and appliqué them onto a wall hanging to go in the school entrance foyer

Table showing the resulting colour from products and mordants

Natural Product	Mordant	Resulting colour
Onion skins	Alum or chrome	Gold
Dandelion heads	Alum	Pale yellow
Dandelion roots	No mordant	Purple
Dandelion whole plant	No mordant	Magenta
Saffron flowers	Alum	Yellow
Cranberry	Alum Tin	Pink Red gold
Apple tree bark	Alum Chrome Tin	Lemon yellow Rust Bright yellow
Dock leaves and stems	Alum Chrome	Bright yellow Bronze green
Camomile	Alum	Bright yellow to buff
Walnut shell	Alum or any mordant	Brown
Seaweed	Alum or any mordant	Brown
Mulberries	Cream of tartar	Tan
Dahlia flowers	Alum	Bright orange
Madder	Alum	Red
Privet leaves	Copper sulphate Alum	Emerald green Lemon/green
Nettle leaves and stems	Alum	Green yellow
Marigold flowers	Alum	Brown/green, yellow to gold
Red cabbage	Chrome	Aqua

Bracken	Alum	Yellow
Mushrooms	Alum	Grey
Blackberries	Acetic acid Alum Alum with salt	Mauve Purple brown Blueish grey
Blackberry green	Iron	Black
Blackberry shoots	Iron sulphate	Black
Carrot tops	Alum Tin	Pale green to yellow Bright yellow
Parsley	Chrome	Green
Fennel	Alum Chrome	Bright yellow Gold
Spinach	Cream of tartar Alum	Olive green Green yellow
Blueberry	Alum	Blue to purple
Broom flowers and stems	Alum Chrome	Yellow Gold
Buttercups	Alum	Yellow
Fern buds	Alum Chrome	Yellow green Olive green
Golden rod blossoms	Alum	Lemon yellow
Grapes	Alum	Violet
St John's wart flowers	Tin	Red
Maple tree bark	Alum Iron	Olive Purple
Rhubarb leaves	Alum	Strong yellow
Rose hips	Alum	Dull rose