# The dyer's workshop

In the days before people learnt how to make dyes from chemical reactions, the only way to dye cloth was using natural dyes.

You are going to make some natural vegetable dyes, and use them to dye some cloth. Why not try some tie-dyeing or batik when you've made them?

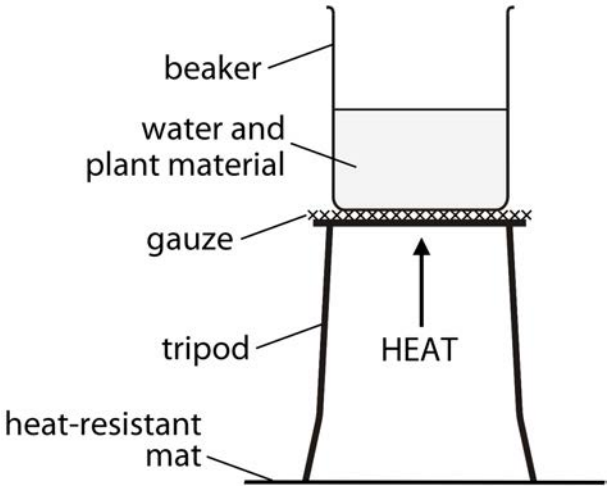
## Job 1

Put some onion skins into a beaker and some beetroot slices into another beaker.

Add about 100 $cm^3$ of water to each beaker.

Carefully boil for 15–20 minutes to get the juices out.

Make sure the apparatus is stable and secure before heating the water.



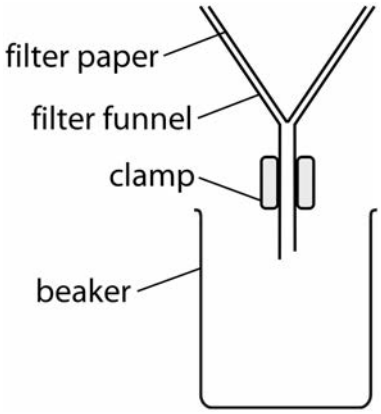

## Job 2

When the dye is ready, let the beaker cool for a few minutes.

While you are waiting, you can repeat **Job 1** for different plant materials such as red cabbage or raspberry.

Filter the cooled liquid into a clean beaker.

This is your dye bath.




## Job 3

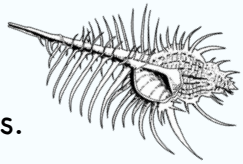
Using tongs, put one piece of cotton and one piece of wool into a dye bath.

Carefully boil them together for 10 minutes, stirring them with the glass rod from time to time.

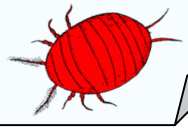
Take the materials out of the dye bath using tongs. Leave them to dry.

While you are waiting, do **Job 2** for the other plant material extracts.

Natural dyes can come from animals, too. The ancient Romans made a **purple** dye from a shellfish called *Murex*.



Soldiers in the British Army wear a red coat for ceremonies. In the past, the coats for privates were dyed with rose madder (a plant), but the coats for officers were dyed with a more expense red dye made from the cochineal beetle.



# Dyeing

## Teacher Guide

## Contents


- Activity notes
- Student checklist
- Technician notes


## Activity notes

This activity is intended as a way to use standard laboratory techniques using natural sources, rather than purified substances. It makes a good introductory activity and the lab smells nice for a change! Easily obtained sources include onion skins, beetroot and red cabbage. All give pleasant, though not vivid, colours. Elderberry or blackberry may give better colours. Flower petals seem mostly to make a sort of brown colour. Colour extraction works well if the plant material is cut up finely and not heated in too much water.

Provide the students with squares of cloth. Wool works best but cotton such as calico also works. This should be washed first, as there is often a finish on the cloth which inhibits thorough wetting and uptake of the dyes. The cloth can be dyed simply by immersing it in a beaker of the dye solution, but you could experiment further using methods such as tie-dyeing and batik.

Tie-dyeing works best if the string is wound very tightly around the cloth, and the material is not left for more than 30 minutes in the dye bath.

Batik works especially well. A simple way is to use a paint brush to apply molten candle wax to the undyed cloth. The cloth is then dyed, dried, and the wax removed by scraping or rolling the cloth to reveal the undyed areas. These can be left undyed, or the cloth can be put into a different dye bath to obtain multi-coloured effects.

### Heating water 

Make sure hair and clothing is tied securely to avoid the naked flame from the Bunsen burner. Check that the apparatus is secure and stable before heating begins. Take care to avoid spills and splashes of hot water.

# Dyeing

## Student checklist

Check that you have the following things.

- 3 × 250 $cm^3$ beakers
- 1 × 100 $cm^3$ measuring cylinder
- 1 × glass rod
- 1 × crucible tongs
- 1 × Bunsen burner, tripod, gauze mat
- 1 × filter funnel with filter paper
- 1 × stand, boss, clamp
- 1 × heat-resistant mat
- pieces of cloth
- string

You may also need access to candle wax, paintbrushes and a drying line.


# Dyeing

## Student checklist

Check that you have the following things.

- 3 × 250 $cm^3$ beakers
- 1 × 100 $cm^3$ measuring cylinder
- 1 × glass rod
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- 1 × stand, boss, clamp
- 1 × heat-resistant mat
- pieces of cloth
- string

You may also need access to candle wax, paintbrushes and a drying line.

# Dyeing

## Technician notes

**Per group of students:**

3 × 250 $cm^3$ beakers
1 × 100 $cm^3$ measuring cylinder
1 × glass rod
1 × crucible tongs
1 × Bunsen burner, tripod, gauze mat
1 × filter funnel with filter paper
1 × stand, boss, clamp
1 × heat-resistant mat

**In the lab:**

pieces of washed cloth (wool or cotton)
string
can of candle wax
hot water bath for the candle wax (teacher to supervise)
assorted paintbrushes
drying line with bulldog clips