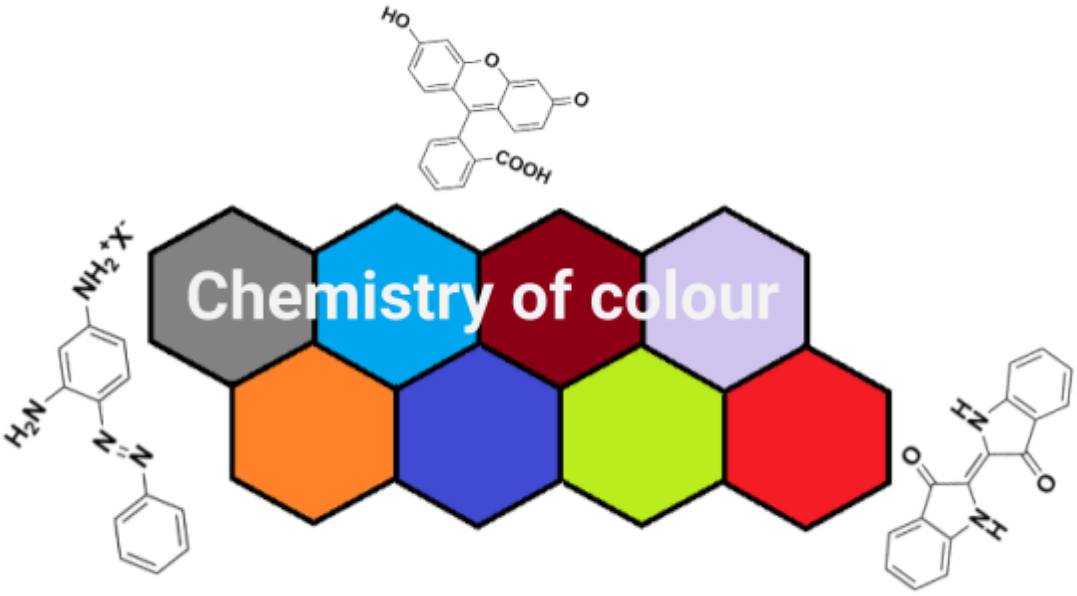

This sheet gives instructions for four ways to make your own colours and three art projects to use them in. Find out more in the Great Exhibition Road Festival Chemistry of colour workshop on youtube.

Safety reminder: Children must be supervised by a responsible adult.
Take care using spices, as these can stain fabrics and surfaces.

Making colours

1. Fruity crayons and dyes
2. Sweet dyes
3. Food colouring marbling
4. Spice paints

Art projects

1. Sunset collage
2. Wildflower greeting cards
3. Great Exhibition Road Festival bunting

These activities were devised by artist Momtaz Begum-Hossain, and Imperial Collage, London researchers Emily Xu and Helena Dodd. All photographs by Momtaz Begum-Hossain.

THE GREAT EXHIBITION ROAD FESTIVAL

Make fruity crayons and fruity dyes

Materials:

- A few fresh fruits, washed. (Take your pick! Strawberries, raspberries, blackberries, blueberry, tangerine and watermelon work well)
- Small cups, plates or bowls (one per fruit)
- Cotton wool balls or a paintbrush
- A table knife
- A spoon or fork
- White paper
- Water

Young children must be supervised to prevent choking on fruits.

Instructions:

- Take a whole blackberry, raspberry, half a strawberry or a finger of watermelon and press it gently onto your paper to draw with it like a crayon
- To make dyes, add each fruit to a separate bowl
- Mash the fruit with a spoon or fork
- You can add a touch of water to make a flowing ink
- Dye your paper by painting it with your dyes using a brush or cotton wool ball
- Leave your painted paper to dry for 30 minutes, then you can use it in the art projects

The chemistry of these colours

This activity uses the natural dyes present in fruits to paint paper. We chose these fruits in particular because they give colours similar to Mauveine, a dye developed by the famous chemist William Perkin. You may notice that the colours you get from fruit are quite pale - that is completely normal! It is due to both the high water content present in the fruit, and also due to the fact that quite often natural dyes are less bright than synthetic dyes. You can find out more in our online workshop on YouTube.

Make sweet dyes

Materials:

- Packet of skittles
- Water
- Two plates or saucers
- Cotton wool pads

Young children must be supervised to prevent choking on sweets.

Instructions:

- Arrange the skittles on a plate in a pretty design
- Carefully pour water on to the plate so the water comes halfway up the sweets
- Watch the colours bleed out of the sweets and form patterns. This takes a minute
- Once the pattern is settled, carefully lift out the skittles and put on a second plate
- Place your cotton wool pads on the plate with the coloured water
- Allow the cotton pads to soak up the colours for a few seconds, then lift them off to see the colours
- Leave the pads to dry so you can use them in the art projects
- Because the water only came half way up the sweets, the colour has only come off one side. You can turn the sweets over and use them again

The chemistry of these colours

Depending on the kind of sweets that you use, they will have either natural or synthetic dyes, or a mix of both. It is likely that they will be synthetic, so the colours look brighter than the fruit dyes. On the cotton wool they won't look as bright, due to the water diluting the dye. You can experiment: try adding less water, adding more sweets, or using different kinds of sweets. You can also try other liquids, such as milk. Every time you try something new, watch what happens. Do you get different results? Why?

Food colour marbling

Materials:

- Water
- Cooking oil
- Toilet roll
- White paper
- A towel
- A tray that holds water, or a washing up bowl
- Food colouring - two colours (or more if you like)
- One small bowl and one spoon per colour
- A toothpick or bamboo skewer (if you like)

Children must be supervised. Take care with sharp objects.

Instructions:

- Pour water into the tray
- In a small bowl, add a spoonful of oil and a few drops of food colouring. Stir them together carefully. Repeat with your other colour(s)
- Gently add the first colour to the surface of the water in the tray. You can pour, drip or add tiny dabs with the end of your spoon
- Add a few drops of your second colour
- Make a print by gently laying paper on the surface of the water
- Pinch the corners of the paper with your fingers, carefully lift it off and place it on a towel to dry
- The paper will be oily, you can lift off some oil with a sheet of toilet roll (be gentle - don't rub, or the paper can tear)
- You can make swirls by dragging a toothpick through the colours, and print again
- If you like, add a third colour, see what changes and make more prints
- When your paper is dry, you can use it in the art projects

The chemistry of these colours

The dyes in your food colouring will either be natural or synthetic. Lots of people prefer natural food dyes nowadays. It is likely that out of all our activities, this one will give the brightest colours and results. This is because the dyes in food colouring are very pure and very concentrated. It's why you only need tiny amounts when you cook with them! The dyes in fruits and sweets are much more dilute, because their main job is not to be colourful, but to be eaten.

Spice painting

Materials:

- A teaspoon of spice, e.g. turmeric, cumin or paprika (do not use chilli or cayenne powder as they can cause irritation)
- A paint brush or cotton wool balls (one per spice)
- A small cup, plate or bowl (one per spice)
- White paper
- Water

Children must be supervised. Keep hands clean and take care not to get spices in the face or eyes.

Take care using spices, as these can stain fabrics and surfaces.

Instructions:

- Add a teaspoon of spice to a bowl
- Stir in a teaspoon of water and keep stirring to create a paste - this is your paint. If you need more water, add it slowly, drop by drop
- Paint your paper with the spice paint using a brush or cotton wool
- Try gently dripping some paint on a new sheet of paper (take care not to flick it in your eyes)
- Fold the paper in half and press, then gently reopen to see the patterns you have created
- Leave your painted paper to dry for 30 minutes, then you can use it in the art projects

The chemistry of these colours

Spices tend to be yellow, red and brown in colour, due to the molecular structures of the natural dyes that they contain, and the wavelengths at which these absorb light. Because of this, the results from this activity will give you different colours than the other activities, which will provide a nice contrast for the artwork you can make out of them.

Art project: sunset collage

Materials:

- White paper
- Papers coloured with spice paint or fruit dye
- Scissors
- Pencil
- Glue stick

Instructions:

- Like us, you have probably created some yellow, red, and orange papers by using spices and fruit. You can cut and stick them to make a sunset scene however you like. This is how we made ours:
    - Stick one whole sheet of turmeric painted paper onto white paper
    - Take a sheet of splattered spice paper and draw the mountain range shape, cut it out and stick it on the turmeric paper
    - Stick on a circle sun made from blackberry paper
    - Use lighter pink strawberry paper for the sun's rays
- You can find out more about the Sun, and do some more artwork with our Draw the Sun activity

Art project: flower greeting cards

Materials:

- Card
- Glue stick
- Scissors
- Coloured pens or pencils
- Coloured paper from fruit dyes, spice paint or marbled paper activity
- Cotton pads dyed with sweets

Instructions:

- Fold the card in half
- Cut out three circles from the coloured papers and stick on the card
- Cut three flower shapes from cotton pads
- Stick one flower in the centre of each paper circle
- Draw stems and leaves on with coloured pens or pencils

Art project: festival bunting

Materials:

- Glue stick
- Scissors
- Coloured paper from fruit dyes, spice paint or marbled paper activity
- A circular object to draw around (e.g. a cotton pad or jar lid)
- Pencil

Instructions:

- Draw circles on the coloured papers using a circular object as a guide
- Cut out the circles
- Fold each circle in half, then reopen them
- Spread glue on the backs of the circles
- Refold the circles to attach them to the string