

Colour Science Worksheet

Learning outcomes

In this activity you will learn about different properties of liquids in science and colour theory, we will use colour to highlight these processes so we can see the effects more clearly. We will also highlight different careers that these experiments could relate too.

Skills you will use to complete this task will be attention to detail, research, creativity, observation and recording the results of your experiments.

Introduction

This activity will let you investigate different properties of liquid and to highlight the science we will use colour which will allow you to see how these liquids interact with each other. .

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Activity 1

In this activity we get water to walk and make new colours! Get an adult to help you with this as it might get messy.

To do the experiment you'll need:

- ★ Glasses of equal height (minimum three glasses)
- ★ Water
- ★ Food colouring (different colours)
- ★ Paper Towels

Setting up the experiment

- ★ Line up the glasses 2 inches apart
- ★ Half fill one glass with water, leave one empty and fill the last glass
- ★ Add a different food colouring to each of the glasses with water and mix with a spoon
- ★ Fold a paper towel into a strip
- ★ Put one end of the paper towel in glass with the water/food colouring and the other in the empty glass.
- ★ Wait and see what happens! It will take a while so be patient!



You can add as many glasses as you like even to the point where you can make your own rainbow if you have enough glasses and different food colourings.

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How does it work?

The water appears to defy gravity, but really it moves up the paper towel because of a process called capillary action. Capillary action is the ability of water to flow in tight spaces without the assistance of external forces like gravity. This allows the water to travel up paper towel to the other glass and the food colouring lets us see this working. It takes about 30 minutes for this to happen so be patient!

Chemists work with different substances like liquids and chemists need an awareness of the properties of the substances that they work with. Use the following link to learn more about the things a [Chemist](#) (1) does. A [Biomedical Scientist](#) (2) would work out how to use chemicals and materials to make new medicines, create better food and protect the environment. Colour theory is a key feature of art and design and an awareness of colour theory is essential for working as a [Graphic Designer](#) (3).

Activity 2

This experiment will allow us to see how substances in water are absorbed through flowers using food colouring.

Materials:

- ★ Vases/Containers
- ★ Water
- ★ Food Colouring
- ★ White Flowers (we used daisies)

Optional:

- ★ Stopwatch/clock
- ★ Pencil
- ★ Paper

Setting up the experiment:

- ★ Put water in the jars
- ★ Add food colouring to each jar
- ★ Cut the flower stems to length
- ★ Put your flowers in the jars
- ★ Every 30 minutes check the progress

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After we cut down each bunch of flowers to the size of our jars, we added water and food colouring to each jar. Now we were ready to observe. Check every 30 minutes and the flowers colour will gradually change.



How does it work?

The oil floats on top because it is less dense than the water, the food colouring will drop through the oil into the water as its density is the same as water. When you add the tablet, it sinks to the bottom and starts to dissolve as it does this it releases gas (carbon dioxide). The gas is lighter than water and floats to the surface taking some coloured water with it and when it reaches the top the gas comes off and the coloured water sinks again. This happens over and over until the tablet is completely dissolved.

So why does the flower change colour?

The water that has been pulled up undergoes a process called transpiration, which is when the water from leaves and flower petals evaporates. However, the dye in the water stays to colour the flower.

The coloured water travelling through the flower allows us to see how water moves through the flower and scientists and doctors use more advanced techniques to map blood flow in the human body. Use the following links to open the job profiles for [Biologist](#) (4) and [Botanist](#) (5).

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Activity 3

This experiment will allow us to see how liquids of different densities interact with each other and once again we will use colour to show us this interaction.

Materials:

- ★ A clean clear plastic bottle or other clear vessel (e.g. Fizzy drink bottle with the label removed)
- ★ Vegetable oil, mineral or baby oil.
- ★ Water
- ★ Food colouring of your choice
- ★ Alka-Seltzer Tablets (as many as you choose the more the merrier!)
- ★ A flashlight or a lamp

Setting up the experiment

1. Fill the bottle up about 1 quarter with water.
2. Top up with the oil leaving some space at the top for bubbling.
3. Wait for the oil and water to separate.
4. Drop in 10 drops of food colouring.
5. Add an Alka-Selzer Tablet, start with 1/4 or a half a tablet to begin with and add more.
6. You shine a flashlight through the bottle or put a lamp behind it.



How does it work?

The oil floats on top because it is less dense than the water, the food colouring will drop through the oil into the water as its density is the same as water. When you add the tablet, it sinks to the bottom and starts to dissolve as it does this is it releases gas (carbon dioxide). The gas is lighter than water and floats to the surface taking some coloured water with it and when it reaches the top the gas comes off and the coloured water sinks again. This happens over and over until the tablet is completely dissolved.

By doing this experiment, you will see how all these substances interact with each other and this is knowledge a [Chemist](#) (2) might have. It's possible to add other art materials to this experiment, for example glitter, and by using your imagination to liven up your Lava Lamp could link to a career like a [Graphic Designer](#) (3).

We've looked at some job roles that are connected to the skills you've used by doing these experiments. There are lots of job roles online at [My World of Work](#) (6) for you to find out more.

Website references

1. Biomedical Scientist – <https://bit.ly/2zTzDId>
2. Chemist – <https://bit.ly/2Ub2L4q>
3. Graphic Designer – <https://bit.ly/3dAjN3z>
4. Botanist – <https://bit.ly/2Y2xTnT>
5. Biologist – <https://bit.ly/2XXQDVC>
6. My World of Work – www.myworldofwork.co.uk