



Issue 50

Colour

Welcome to OpenUpScience

from Cambridge Science Centre.

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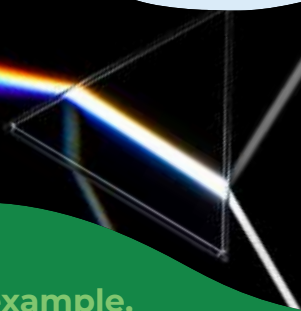
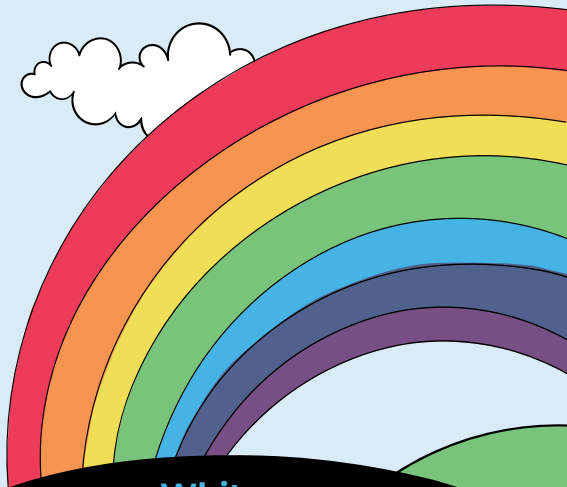
This issue is all about colour.

You see a magical range of colours every day. The green grass, pops of yellow, pink and red in flowers; you might have even seen a rainbow on a sunny and rainy day.

But what is colour? Well, colour is what you see when light shines off something. Things can absorb light or they can reflect light. Something that is white reflects all the light that hits it, and something that is black absorbs all the light that hits it. So to have colour, you need light.

White light is made of all colours of light combined. This image shows a prism splitting up white light into all the colours. This is what a raindrop does to sunlight to make a rainbow.

So, for example, grass is green because it absorbs all colours of light that shine on it apart from green, which it reflects back to us.



Homemade Spectroscope

A spectroscope is a tool that splits white light into all the colours that it is made of. Make your own spectroscope with this activity.

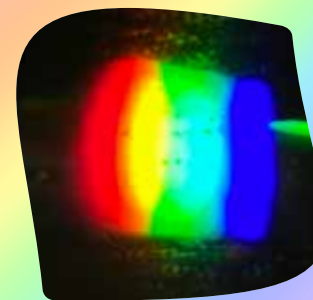
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What to do

1. Get your adult to help you use the craft knife.
2. Use a craft knife to cut a narrow slit at a 45 degree angle towards the bottom of the kitchen roll tube.
3. Directly across from the slit, make a view hole using the craft knife.
4. Trace one end of your kitchen roll onto your small scrap of cardboard. Cut it out.
5. Cut a straight slit right across the centre of your cardboard circle.
6. Tape the circle to the top of your spectroscope.
7. Insert the CD into your 45 degree angle slit with the shiny side facing up.
8. Done! Take it outside! Look through the peephole, you will see a rainbow inside.

What you'll need

- Empty kitchen roll
- Craft knife or scissors
- Old CD
- Pencil
- Small piece of cardboard
- Tape
- An adult



A spectrum is the colours in light spread out. This is the spectrum of colour we saw through this spectroscope.

Colour Wheel Experiment

Create a rainbow wheel and spin it to make the colours disappear.

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What to do

1. Colour in each section of the template opposite a different colour of the rainbow.
2. Cut out the template.
3. Trace the template onto the cardboard to cut out a circle the same size.
4. Glue the cardboard and circle together.
5. Once the glue is dried, poke the wooden skewer through the centre of the circle.
6. Cool part: spin it FAST, you should see the colours blend to appear white, or at least a lighter colour.

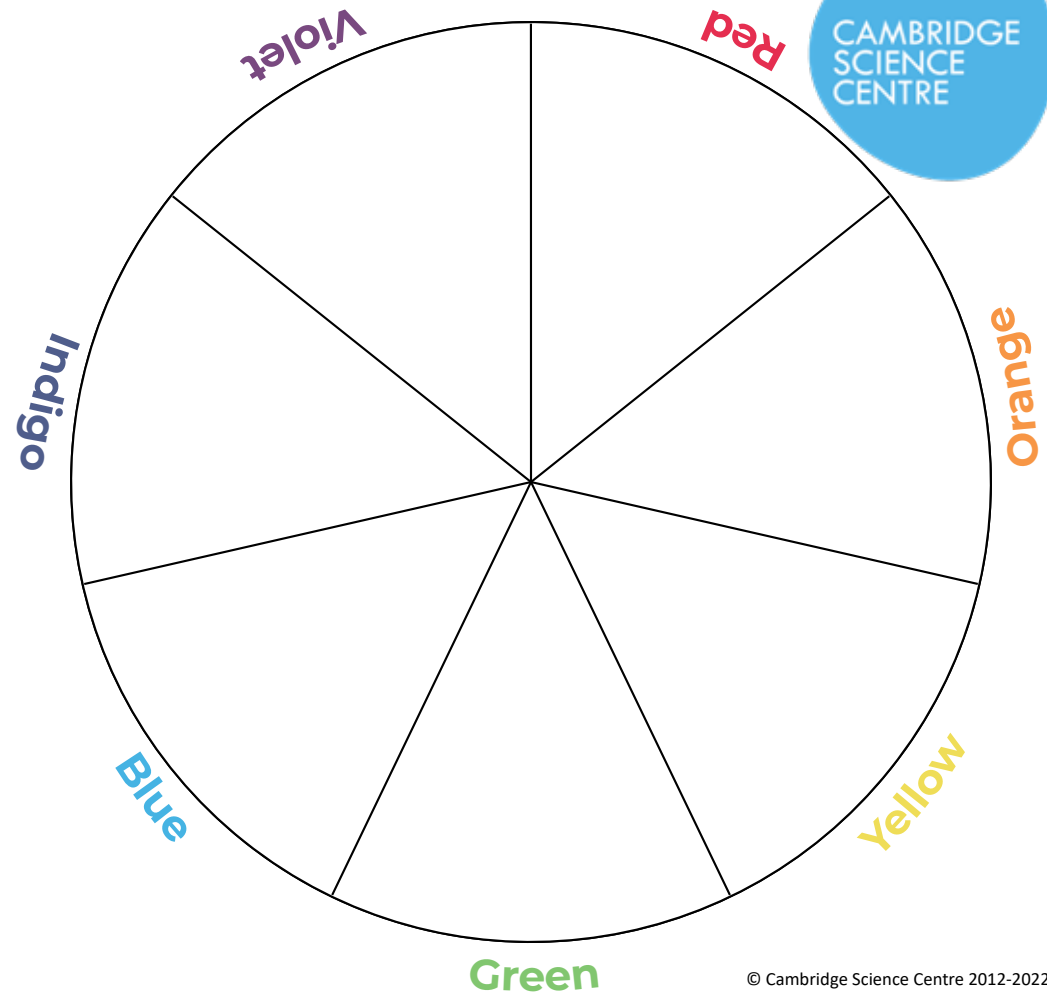
What you'll need

- Crayons, pens or paint
- Wooden skewer
- Glue
- Cardboard
- Template

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What is happening?!

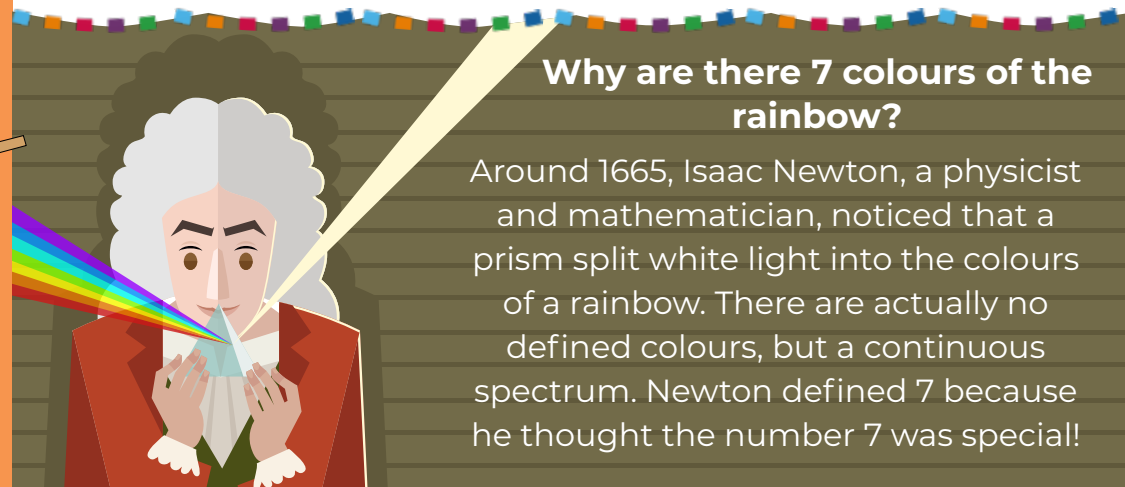
White light, like the light from the Sun, is made up of light from all the colours of the rainbow; red, orange, yellow, green, blue, indigo and violet. When you spin the disk, your brain mixes these colours together. This means the wheel appears white.



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Why are there 7 colours of the rainbow?

Around 1665, Isaac Newton, a physicist and mathematician, noticed that a prism split white light into the colours of a rainbow. There are actually no defined colours, but a continuous spectrum. Newton defined 7 because he thought the number 7 was special!



Back of Template

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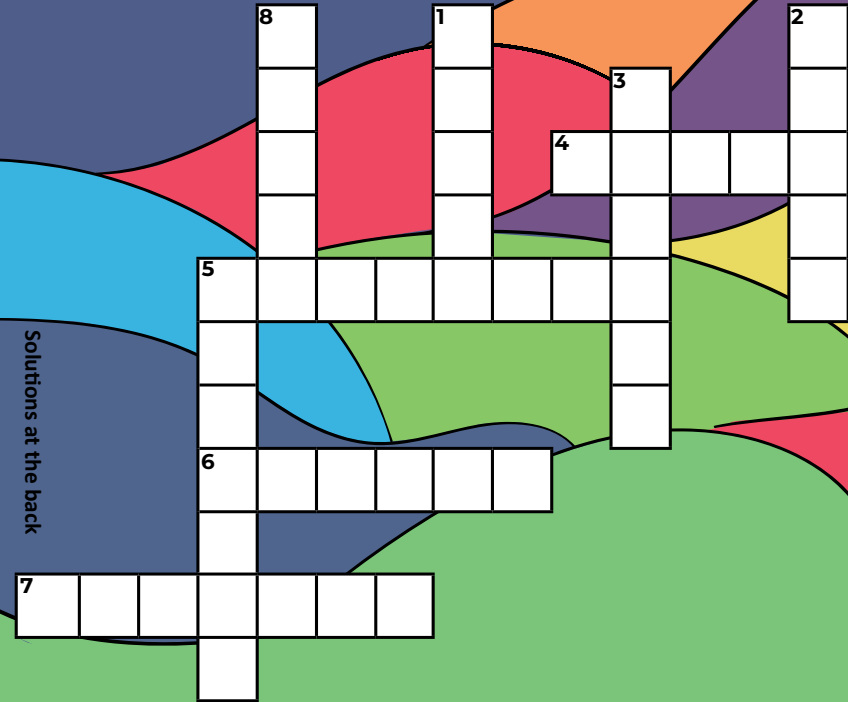
2 + 2 = Green?

Some people have a condition called synaesthesia (say sinna-STEE-zia). This means that their senses can be blended. People with a type of synaesthesia called grapheme colour synaesthesia see colours for different numbers or letters. For these people, the number 4 might be green, so 2 + 2 = Green!

Colour Cross Words

Complete the sentences below and fill in the word on the crossword.

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After experimenting with _____, Issac _____ showed that
3 down *6 across*

_____ light was made up of all the different colours of the
1 down

_____. Something looks a certain colour if it _____
5 down *5 across*

that colour. Something looks black if it _____ all colour.
7 across

Our eyes see colour with cells called _____. There are
2 down

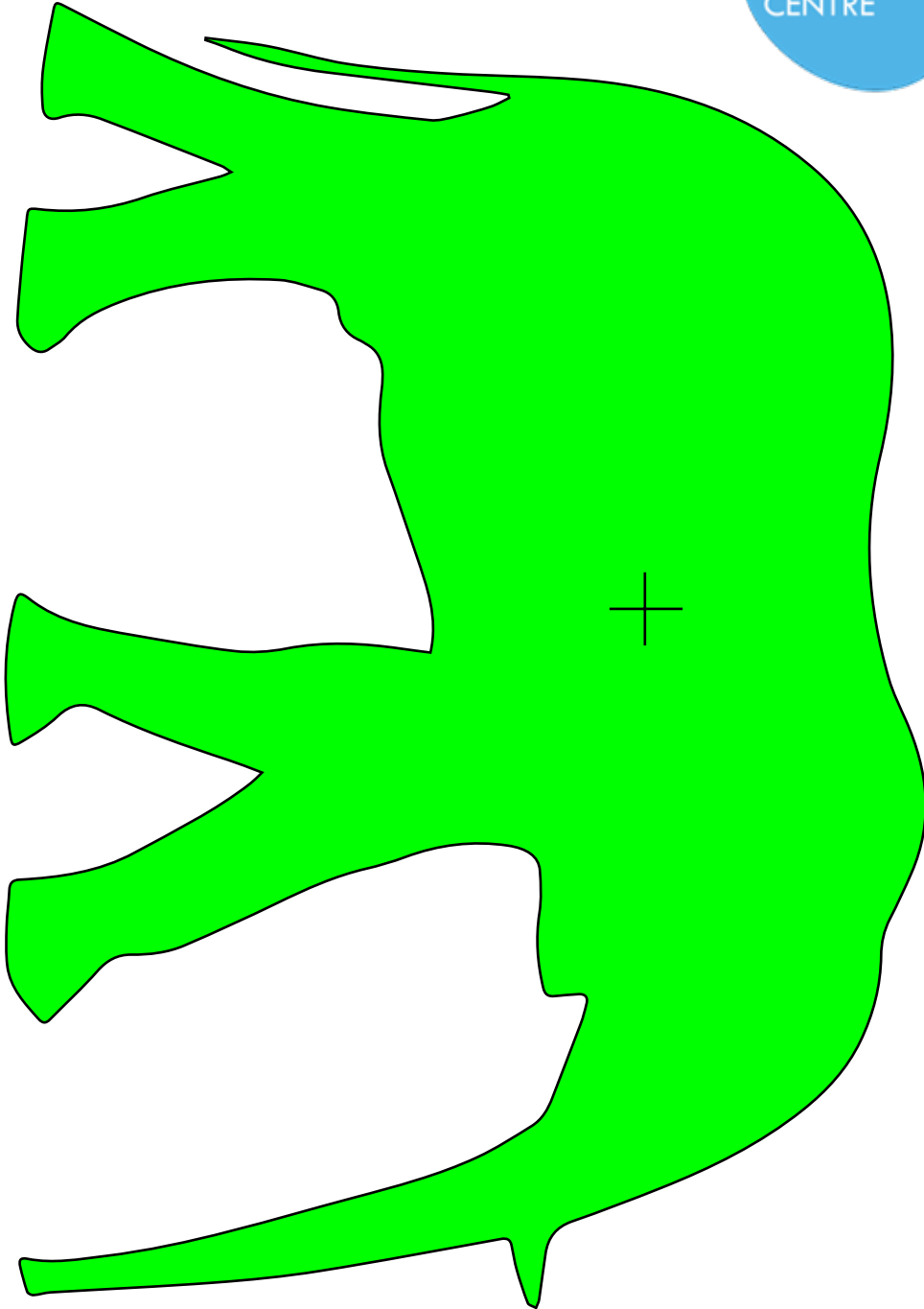
_____ different types of these cells. One sees red, one sees
8 down

blue and the other sees _____.
4 across

Green Elephant

This is the green elephant.

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Pink Elephant

Where is the pink elephant? Well, follow the simple steps below to make it appear.

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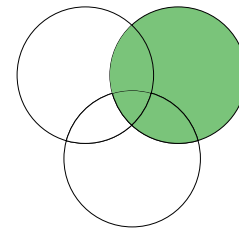
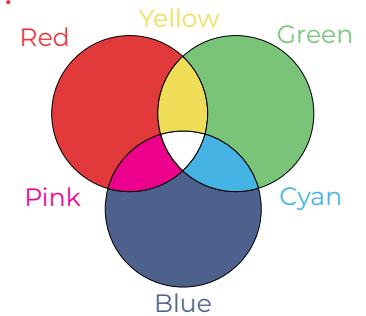


What to do

1. Turn the previous page sideways and stare at the cross on the green elephant for 30 seconds.
2. Look at a white wall or blank piece of paper and blink lots.

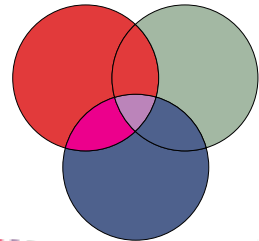
What is happening?!

The primary colours of light are different to the primary colours of paint; they are red, green and blue. Your eyes see colour with three different types of cells called cones. One sees red, one sees green and the other sees blue.



Staring at the green elephant means your green cones get tired and 'run out'!

When you then look at something white, you only get the red + blue which = pink while the green 'recharges'!

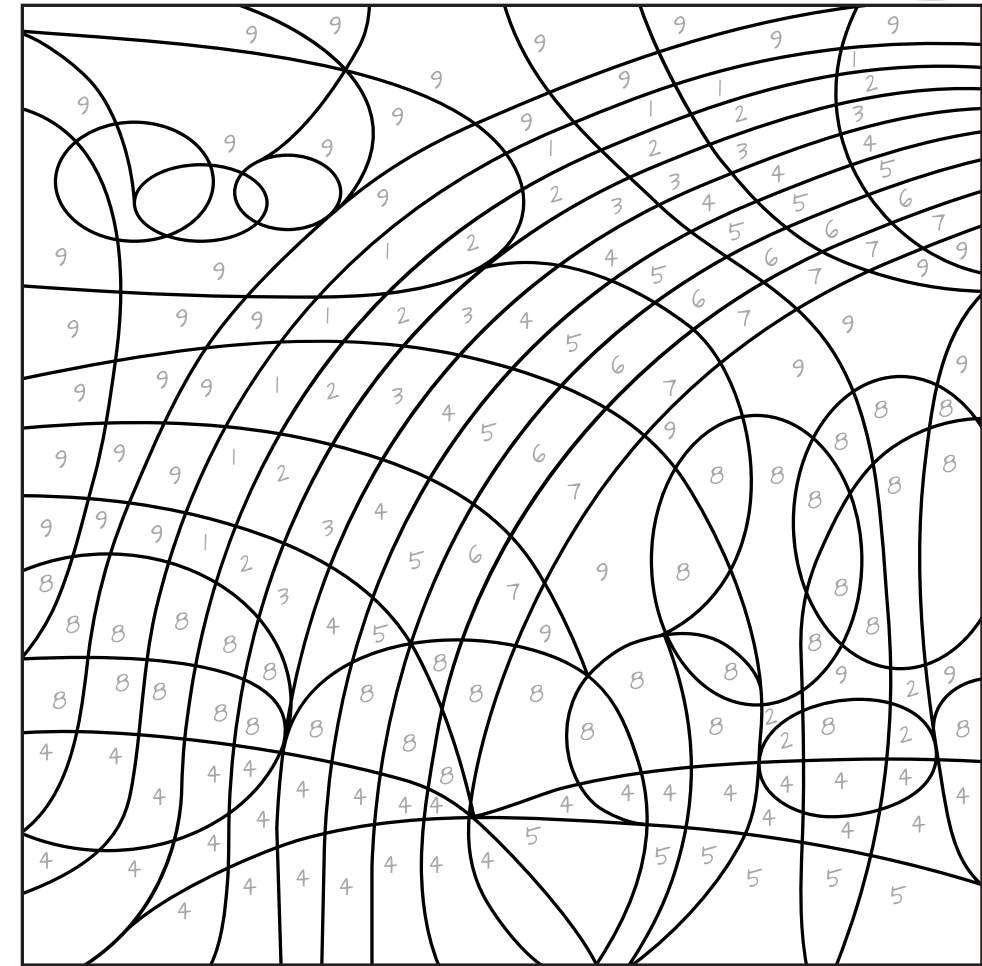


What would happen if the elephant was red? What about if it was yellow?



Colour By Numbers

Work out the number that each sentence is referring to. Colour the number in the picture the colour that the box is to reveal the image.

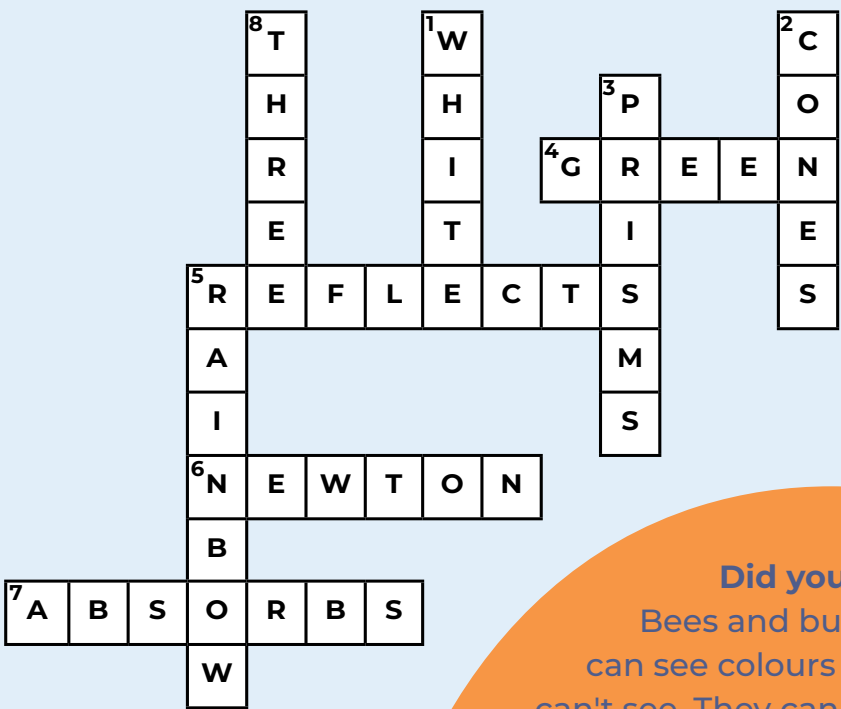


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The number of suns in our solar system	The number of seasons there are	The number of colours in a rainbow
The number of eyes a human has	The number of basic senses people have	The number of legs a spider has
The number of primary colours	The number of faces on a dice	The number that is 3 times 3

Puzzle solutions

If you have any questions or want to send us a photo of your experiments, drop us an email at openupscience@cambridgesciencecentre.org



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Did you know?

Bees and butterflies can see colours that we can't see. They can see past the blue light in the colour spectrum and into ultraviolet light. The petals of the flowers they pollinate have special ultraviolet patterns which guide the insects deep into the flower.



Some of the activities in this issue were kindly contributed by one of our sixth form volunteers.

We are kindly supported by our
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