

Science Challenge



Rainbows

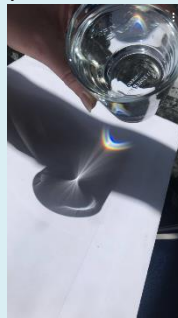
The weather has been very sunny recently and there has been a lot of talk about rainbows. Do you know how and why we see a rainbow? A rainbow is caused by the splitting up of white light. The colours of the rainbow are the visible spectrum.



This BBC Revision guide has lots of information about light. This page demonstrates how a rainbow is formed using a prism.

<https://www.bbc.co.uk/bitesize/guides/zq7thyc/revision/6>

You can make a rainbow without a prism. Use a glass of water, a piece of white paper and a bright sunny window to make your own rainbow. Hold your glass of water in the sunlight and look carefully at the light being reflected from it. You may need to be patient and move the glass around a bit. Watch carefully because your rainbow might be hard to spot!



We are able to see these colours, they make up the visible spectrum. There are more types of light that we can't see.

Use this BBC page to learn about the areas of the spectrum that we can't see, the electromagnetic spectrum.

<https://www.bbc.co.uk/bitesize/articles/z4cpscw>

Shadows

Have you ever noticed your shadow, what colour it is, how it changes size and shape? Have you ever made a coloured shadow? You will need coloured material which will allow some light to pass through it (translucent) You will also need a sunny window, a piece of white paper and some coloured material to test. A glass of orange squash, a coloured plastic bottle and coloured cellophane sweet wrappers all work well.

Technology Challenge



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How To Dissolve an Eggshell

You will need:- An egg, a glass, white vinegar

1. Take a raw egg and put it in a cup
2. Cover it with white vinegar (which is also known as acetic acid)
Q: What do you noticing happening?
A: You should see bubbles collect around the shell (a sign that a chemical reaction is taking place)
3. Leave for 4 to 5 days – observe it every day. Can yo notice ant changes?
Perhaps you could take a photo to observe over time.
4. Go to observe.



See the residue collect and the shell come away?



The whole egg intact!

You should now be able to see shell residue in the vinegar and the yolk whole in the egg white.

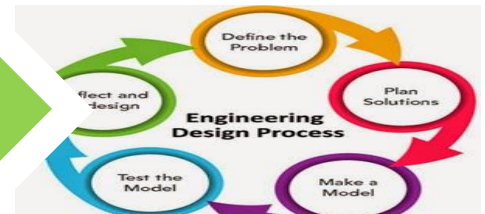
If you still see white residue on the egg you can rub this off lightly with you finger. **It is possible to lift the egg out whole.**

So what has happened?

The acid has reacted with the shell and “eaten” away at it. The shell is made up of calcium carbonate and this gets dissolves due to the acid. The inside of the egg should still be intact because the vinegar doesn’t break down the egg membrane. The egg also swells up - this is because some of the liquid seeps inside it via [osmosis](#). You should be able to see the yellow yolk through the membrane. It really is quite incredible.

You could complete this experiment with a boiled egg – is the result any different?.

Engineering Challenge



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Super sculptures

Do you know what a sculpture is? A sculpture is a 3D work of art which can be made, for example, by chiseling, molding, carving or joining different materials together. **Watch [this clip of 23 incredible sculptures from around the world](#)**. As you watch, **make a list of different materials** that have been used to construct the sculptures.



At the end, decide which your favourite is and do some more research about it. On Microsoft word write a short report about it. It should have: the sculpture's name as the title; include photos of it; paragraph 1 answer who, what, when, where and why; paragraph 2 explain what materials were used, how they were joined together/constructed and why they were suitable for the sculpture; and paragraph 3 give your opinion of it and reasons why people might like to visit it.



Challenge: Sculptures are created for different reasons. Sometimes they are made to share ideas or information; remind people of an important event; or to honour someone. During the current situation we find ourselves in, the **NHS and Keyworkers** are doing an incredible job to support our communities and country. An artist in Hereford has been creating miniature sculptures and leaving them around her village to thank key-workers for what they have been doing. **Your task is to design and**

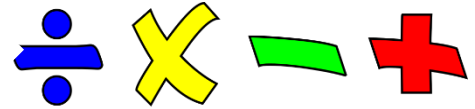
create a sculpture to honour/thank all the local workers who are helping us through this challenging time.

Photo from: <https://www.tewkesburyadmag.co.uk/news/regional/18364295.tiny-sculptures-thanking-nhs-staff-left-around-hereford/>

You can **decide which materials** you think would be best to construct your sculpture. When it is completed, **display it** in your window or (if you have used natural materials) outdoors so that you can encourage people as they pass by. Or perhaps you want to have a go at making a miniature sculpture like Helen and hide them on your daily walk to encourage others!

Evaluate: Take a photo of your finished sculpture. Insert it into a Word document and write a paragraph about: what inspired you; the materials you chose and why you chose them; what went well; and anything you would improve.

Maths & Numeracy Challenge



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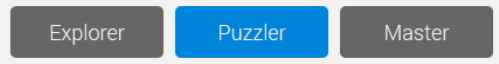
Visual Logic Puzzles – Balance Scales:

This week you are going to develop your own logic to solve and balance visual problems using the following website*

<https://solve.me.edc.org/?mobiles=-62>

*You do not need an account to play these challenges.
A “Solve Me Mobiles” app is available to download on some devices.

Once the Website/app has loaded click the Green “Play” Square



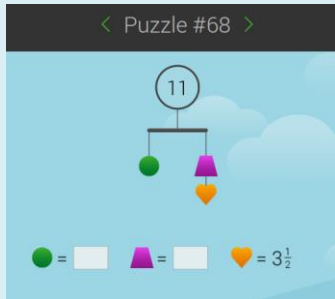
For First Level I it is suggested that you stick to the puzzles in:-

Puzzler level #62 onwards

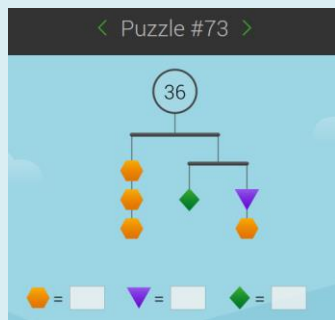
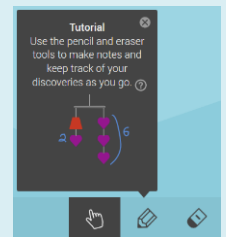
Some of these may be easy, some may be hard – have a go. The beam will tilt and give you visual clues. Remember - It's all about balance.

Use your addition, subtraction, multiplication and division skills and knowledge to help.

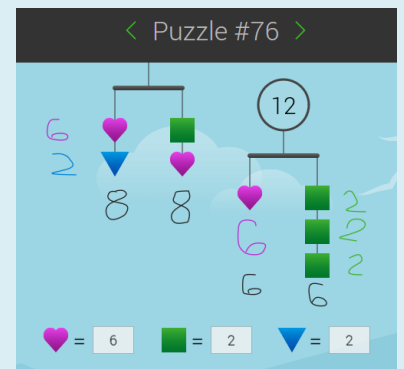
Here are some worked examples:



- 11 is the total of all 3 items.
- 1 green = 1 pink + 1 yellow
- Each side of the scale = half of 11 which is 5.5, so 1 green = 5.5
- Therefore, since yellow = 3.5, pink must equal 2.



- 36 is the total of all 6 items.
- 3 yellow = 1 green + 1 purple + 1 yellow, and
 - 1 green = 1 purple + 1 yellow
- Each side of the top scale = half of 36 which is 18
- So 3 yellow = 18 => 1 yellow = 6
- Each side of the right scale = half of 18 which is 9
- So 1 green = 9
- Therefore, since 1 yellow = 6, purple must equal 3



Literacy Challenge



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Drawing the Text

Here is an extract from the book *Itch* by Simon Mayo

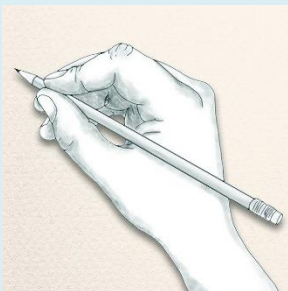
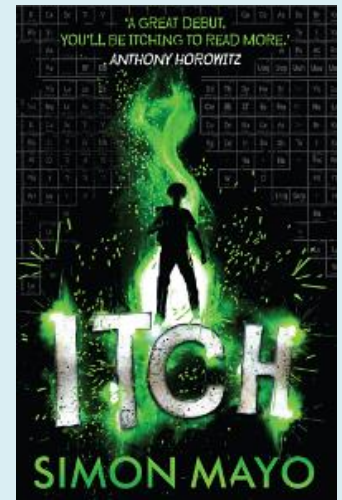
Itchingham Lofte had caused explosions before. There had, in truth, been many bangs, flashes and smells coming from his bedroom in the past. His multi-stained carpet and pockmarked walls bore testament to that. But there had been nothing like this one. It wasn't just the bedroom walls that shook; it was the whole house. Windows and doors rattled, the pots and pans in the kitchen jumped, and two drawers in the dresser opened.

Not that Itchingham was aware of any of that, as he was unconscious. He would have stayed that way too if it hadn't been for the fact that his eyebrows were on fire – and the astute decision of his eleven-year-old sister Chloe to throw a mug of water over his face.

Itch (everyone called him Itch, apart from his mother, whose idea it had been to call him Itchingham in the first place) sat up sharply, shaking the water out of his eyes. 'What did you do that for, Chloe? I did have it under control, you know.'

Chloe shrugged. 'Yeah, right. Your eyebrows were burning,' and she turned and went back to her bedroom, which was across the landing.

Itch felt for the prickly remains of what used to be his eyebrows – what was left crumbled in his fingers.



You are the new Illustrator for this book, and you need to create an illustration for this scene.

Read it a few times to pick out the details and think about which bits are the important ones to include in the illustration.

How would you continue this story?



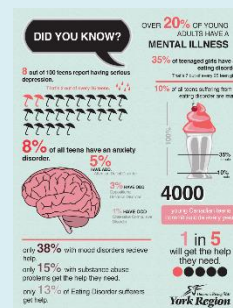
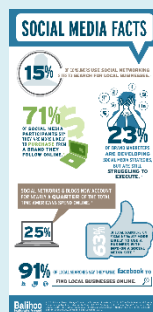
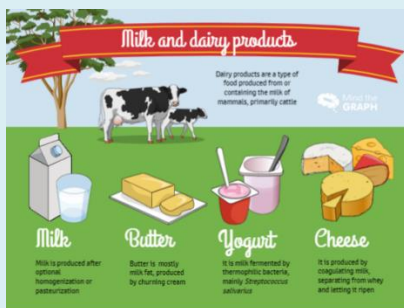
Health & Wellbeing Challenge

Getting the right nutrients!

Watch [this video clip called 'What is a healthy diet?'](#) and read the information below it. Then complete the short quiz at the bottom of the page. Use the information from this webpage to complete this table about the 7 nutrient groups.

Nutrient Group	Use in body	Examples of foods
Carbohydrate		
Protein		
Fats and oils		
Minerals		
Vitamins		
Fibre		
Water		

Do you know what an infographic is? An infographic is a collection of images, charts and minimal text that gives an easy-to-understand overview of a topic. Lots of organisations and businesses use them nowadays to communicate information to people quickly and clearly. Have a look at the examples below.



Challenge: Create an infographic to explain to teenagers what the 7 nutrient groups are and how the body uses them. You can use a computer to create your infographic or hand-draw it. Think about what the key words/facts are that you need to share and images which will grab your audience's eye.

Social Studies Challenge



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Connecting with animals

This week is **Mental Health Awareness Week**. Being outdoors in your garden or local community can improve your mood, reduce stress and really help you relax. Spending time in green space or bringing nature into your everyday life can benefit both your mental and physical wellbeing. For example, doing things like growing food or flowers, exercising outdoors or being around animals can have lots of positive effects.

Your challenge this week is to explore your local community and surroundings and show awareness of the animals in nature and pets you come into contact with.

Things to try

- Watch out for wildlife. If you don't live near open countryside, try visiting a local park to look for squirrels, fish, insects, ducks and other birds.
- Hang a bird feeder outside a window. If there's space, you could build a small wooden nesting box on a tree or under a windowsill.
- Try birdwatching. You don't need any special equipment. (See the [RSPB](https://www.rspb.org.uk/) website for more information on feeding, sheltering and watching birds.)
- **Try pet-sitting or dog walking. Offer to be a pet sitter in your local neighbourhood, volunteer to walk dogs for an elderly neighbour or relative or ask to borrow a friend's dog for occasional evening or weekend walks.**

****Currently people might not agree to this due to Covid restrictions and articles relating to pets and the virus.****

- Take part in a nature survey. This might involve counting birds, animals or insects in a particular time and place, or reporting individual sightings of wildlife. (See the [Big Garden Birdwatch](https://www.bigbirdwatch.org/), [Bumblebee Conservation Trust](https://www.bumblebeeconservation.org/) and [Big Butterfly Count](https://www.bigbutterflycount.org/) for examples of nature surveys.)



Expressive Arts Challenge



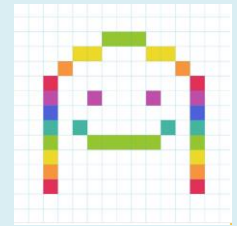
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Chrome Music Lab – Song Maker:

Chrome Music Lab is a website that makes learning music more accessible through fun, hands-on experiments.

It is a tool to explore music and its connections to science, math, art, and more. It can be used to make your own songs using the [Song Maker](#) experiment, which lets you make and share your own songs.

You do not need to make an account and it can be accessed across devices– phones, tablets, laptops – just by opening the site on a web browser such as [Chrome](#).



Song Maker

<https://musiclab.chromeexperiments.com/Song-Maker/>

To simply make a song, add notes by clicking in the grid.

An introduction vide can be found here –

<https://youtu.be/BancaqSxlwgc>

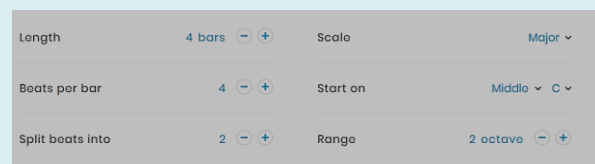
- Here is a video showing how a **Star Wars** tune was made on Song Maker – (you can edit this composition)

<https://musiclab.chromeexperiments.com/Song-Maker/song/6173885272686592>

- Here is a video showing how **Dance Monkey** was made on Song Maker –

<https://youtu.be/RkwwVPKlOk>

What songs can you compose of Song Maker? It can be your own composition or a copy of a well known song.



Use the Settings icon to change musical properties

To save:

- Once you've finished, click Save
- On the next screen click Copy Link and copy that link to your files/message text, send that link to your teacher or copy it into a Teams Chat channel for others the hear.
- Additionally, there are options to download a WAV file (3) if you would like to keep an audio file version of your piece, or a MIDI file (2) which can be used in another software program like GarageBand, Soundtrap or Bandlab

Your song is saved at this link:

<https://musiclab.chrom>

Copy Link



EMBED CODE ▾ DOWNLOAD MIDI DOWNLOAD WAV