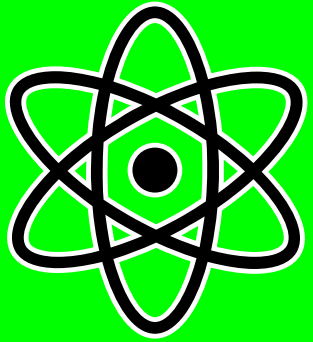
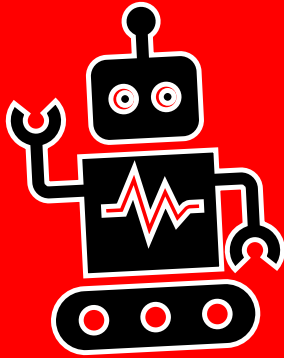


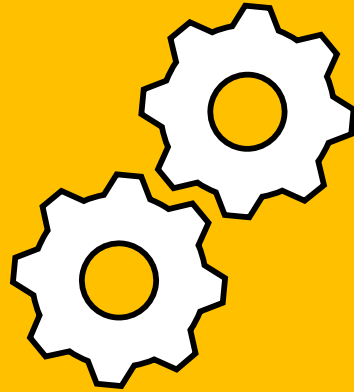
**S**



**T**



**E**



**A**



**M**



**Science**

**Technology**

**Engineering**

**Arts**

**Mathematics**



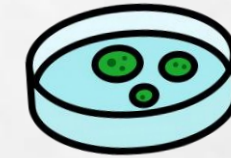
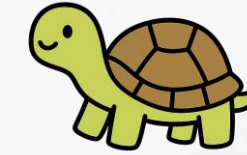
*High Flyers*

**Issue 1**

Mad Science Saturday run by Highsted enthused Year 5 students across Swale. Half of the day was led by ten brilliant student STEM ambassadors who helped pupils dive into six exciting activities!

# AMAZING ACTIVITIES!

- Investigate the differences between tortoises, terrapins, and turtles
- Calculate how fast ferrets can travel (they're speedy!)
- Test household materials to discover whether they were acidic or alkaline
- Explore how the centre of mass helps toys balance
- Discover the amazing microscopic world
- Learn all about density and why some objects float while others sink



# Spectacular Science Shows!

The second half of the day was bursting with spectacular science demonstrations. Two teachers amazed pupils with dramatic experiments, while other workshops explored:

- The science of reflection
- The power of electrical circuits

There were dancing raisins bouncing up and down in fizzy drinks and even an explosive potassium reaction that left everyone wide-eyed with amazement!



**Science**

**Mad Science Saturday: Curiosity Across Swale!**

*High Flyers*



# THE SCIENCE OF MAKING ICE CREAM IN A BAG!



HAVE YOU EVER WONDERED HOW ICE CREAM GETS COLD AND CREAMY? YOU DON'T ALWAYS NEED A MACHINE TO MAKE IT! WITH JUST A FEW SIMPLE INGREDIENTS, SOME SCIENCE, AND A BAG OF ICE, YOU CAN MAKE DELICIOUS HOMEMADE ICE CREAM - RIGHT IN YOUR KITCHEN

OR CLASSROOM!

## The Science Behind It

So what's happening here? Let's find out!

- Ice by itself is cold, but when you add **salt**, it **lowers the freezing point** of the ice.
- This means the ice needs to absorb more heat to melt - it gets *even colder!*
- As the ice and salt absorb heat from the milk mixture, that mixture starts to **freeze**, turning into creamy ice cream.

This is a great example of how **science and food** work together. You're using chemistry to change a liquid into a solid - and it tastes amazing too!

## Fun Facts!

- The salt doesn't go into your ice cream - it just helps make it cold faster.
- If you shake longer, your ice cream will be thicker.
- You can try adding chocolate chips, fruit, or sprinkles for extra flavour!

## Ingredients You'll Need

- 1 cup of milk (or cream for creamier ice cream)
- 2 tablespoons of sugar
- $\frac{1}{2}$  teaspoon of vanilla extract (for flavour)
- Ice cubes (enough to fill half of a gallon-sized bag)
- $\frac{1}{3}$  cup of salt (rock salt or table salt works)
- 1 small resealable bag
- 1 large resealable bag



## Step-by-Step Recipe

- Mix the ice cream base!  
Pour the milk, sugar, and vanilla extract into the small bag. Seal it tightly so it doesn't leak.
- Prepare the ice bag!  
Fill the large bag halfway with ice cubes. Sprinkle the salt over the ice.
- Put it all together!  
Place the small bag inside the large bag and seal the large one tightly.
- Shake, shake, shake!



Food Science

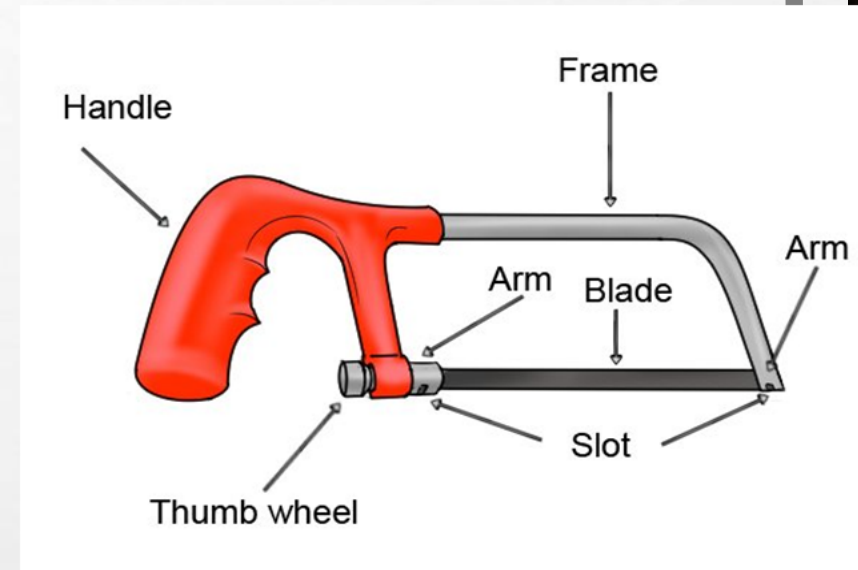
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# Junior Hacksaw



A junior hack saw is an essential DIY tool that is used for cutting wood, metal and plastic.

This is a hand tool and is operated by hand. The teeth along the bottom of the blade enable the metal saw to cut through the material.



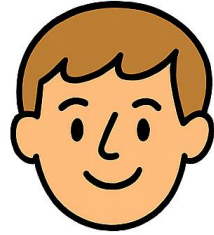
Could you write a list of all of the products that you use day to day, how many have you got? Now can you think of one which you would like to improve? How would you make it better? What isn't working so well? Why do you want to change it?

Create 5 small drawings to show how you would amend and improve the design.



# Facial Recognition

Have you ever seen a friend all the way across the playground and known it was them straight away? Or spotted your teacher hey've hairstyle.



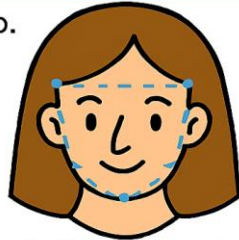
That's your brain doing something really clever. It is using facial recognition.

Yes, our brain can tell us who that person is by just looking at their faces.

Facial recognition is how we humans and computers can tell people apart by looking at their faces. Can you find a match?

## How do computers recognise faces?

Computers don't see faces like we humans do. Instead, they use dots, measurements and numbers to look at faces.



Facial landmarks

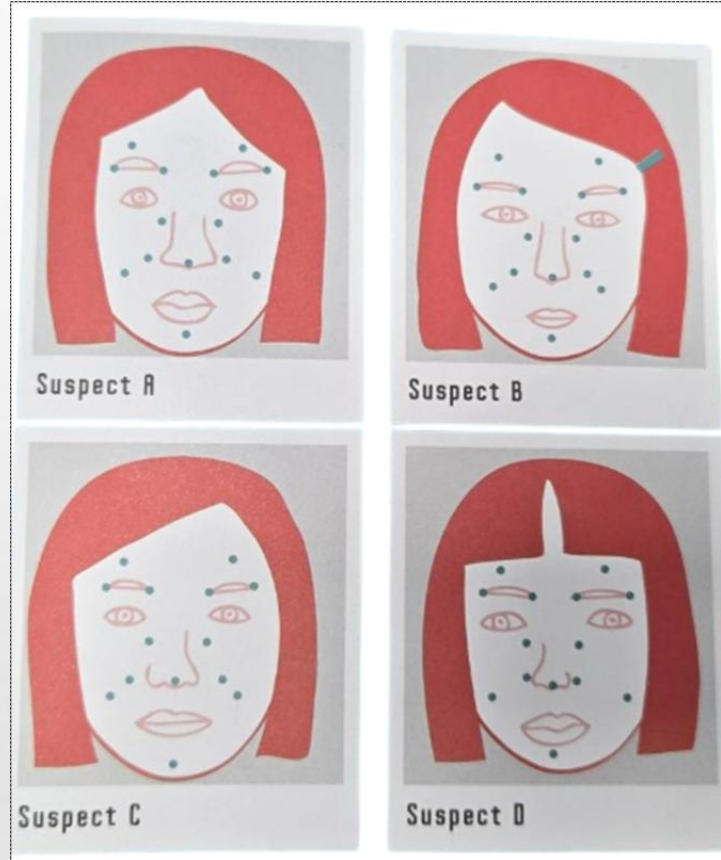
When a computer looks at a face, it places small dots on important parts of the face and these dots are called facial landmarks such as:-

- The corners of the eyes
- The tip and sides of the nose
- The corners of the mouth
- The chin and jawline

The computer will measure the following data to find a picture of a face:-

- How fanapct the eyes are
- How long the face is
- How far the nose ifrom mouth

Every person has the same landmarks, but they are inlightly different positions on the face.



## Challenge: Who dunnit?

Imagine you are a detective! You have got pictures from a security camera at the scene of a robbery but the burglar's face is all blurry!



Can you find a match?



Let's solve the mystery!

**Step 1.** Measure the lines on on half of the picture

**Step 2.** Connect the points on each suspect's face

Can you find a match?



Engineering

High Flyers





Clay can be used to make ceramics to include bowls, mugs, plates, cups and teapots. You will have plenty of these everyday object at home.

The clay can be manipulated into any shape, decorations added and then fired in the kiln to change its appearance into a breakable object.

## Kiln

The temperatures in the kiln can reach up to 1050 degrees Celsius and can take around three days to complete a firing. The clay is then glazed and returns to the kiln to be fired again and has a shiny finish when completed.



Image: <https://casolia.com/>

<https://www.introinto.com.au/>

You may have used air drying clay before, this does not need to go into a kiln to be fired, as the name suggests this dries over a few days when left un covered.  
What could you make using clay? A cup, a teapot or a whole tea set?



Arts

*High Flyers* 

# KAKURO PUZZLE.

Kakuro is like a crossword puzzle with numbers. Each 'word' must add up to the number provided either above it or to the left of it (in the grey squares). 'Words' can only use the numbers 1 to 9 and any number can only appear once in a 'word'.

For example: These numbers add to 7

			15	7	
	11	12	3	2	1
16	1	2	9	4	
10	3	1	4	2	
16	7	9			

Your turn:

	11	13			8	12
3				6	15	
4			10	7		
21					10	19
	8	17	15			
21				16		
9				3		

If you would like to try more Kakuro puzzles visit: [www.kakuroconquest.com](http://www.kakuroconquest.com).



Mathematics

High Flyers



# INSPIRATIONAL FIGURES



**Verona Holmes**  
**1889-1964**

**Mechanical Engineer and Inventor**

Verona Holmes was a brilliant engineer and inventor who lived in England many years ago. During the First World War, many men went away to fight, so women had the chance to do new kinds of jobs. Verona started working in engineering factories, learning how to build things like wooden propellers for aeroplanes. Verona eventually invented useful machines and tools, including special valves for engines and medical equipment. She worked to help more women become engineers too, encouraging them to try new things and follow their dreams.

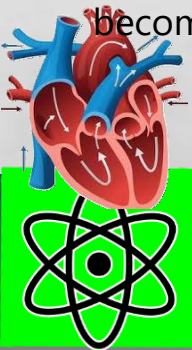


**Hertha Ayrton**  
**1854-1923**

**Electrical Engineer and Suffragette**

Hertha became famous for her important discoveries about electricity. She studied something called the electric arc, which was used for bright lights in streets and buildings. Her improvements helped make these lights more stable and less noisy. She also invented a special fan used during World War I to help clear dangerous gas from the air and protect soldiers. Hertha Ayrton is remembered today as a pioneer for women in science, showing that brilliant ideas can come from anyone, no matter who they are.

UNSUNG  
HEROES OF  
STEAM



*High Flyers*



# STEAM BOOKS TO READ

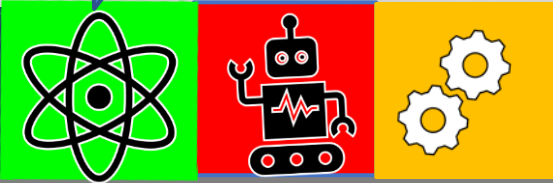
**Wings, Waves and Webs**

**Happy Stories for Nature Lovers**



A beautiful addition to the home bookshelves of little nature lovers, and to school libraries, Robin Mitchell Cranfield's *Wings, Waves and Webs* combines the magic of mathematical patterns with the magic of nature. Different types of patterns are explored in turn - the spots on a ladybird that aid identification. The stripes on a skunk that send warnings to predators. From this, the book shifts to more complex patterns while retaining its pitch-perfect simplicity as it introduces young readers to the likes of mirror symmetry, as found on butterfly wings, and the collective motion of stalling flocks and schools of fish.

Set in the context of the connectedness of nature, and how many people around the world feel a love of nature "in their bellies", their bodies and their bones", Casey explains that many people are also "giving their time, creativity and care to make a more beautiful, healthy, peaceful world." Among the stories of hope shared in the book, we read of Anna and her creation of 'The Children's Forest', and how a depleted population of humpback whales has been brought back from the brink in the South Atlantic. We discover how the International Dark Skies Association is helping green turtles, how red kites have been restored to England and Wales and how tiger numbers are on the rise in India.



**High Flyers**

# ACKNOWLEDGMENTS

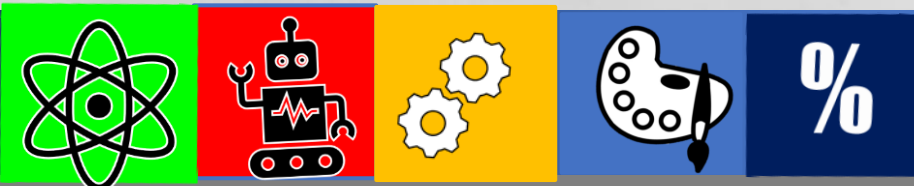
High Flyers was produced by Highsted Grammar School to inspire Key Stage 2 pupils in local primary schools to develop a passion for learning across the curriculum.



With thanks to Miss Gardiner, Miss Appleton,  
Miss Aubeeluck, Dr Millgate,  
Mrs Bradbury-Jones and Mrs Rennie for  
sharing their enthusiasm for STEAM.  
A special thank you to Mrs Longley.

## Maths solution

<sup>2-</sup> 3	<sup>2</sup> 2	<sup>8×</sup> 1	4
1	<sup>7+</sup> 4	3	2
<sup>9+</sup> 4	<sup>2÷</sup> 1	2	<sup>2-</sup> 3
2	3	<sup>4</sup> 4	1



*High Flyers* 