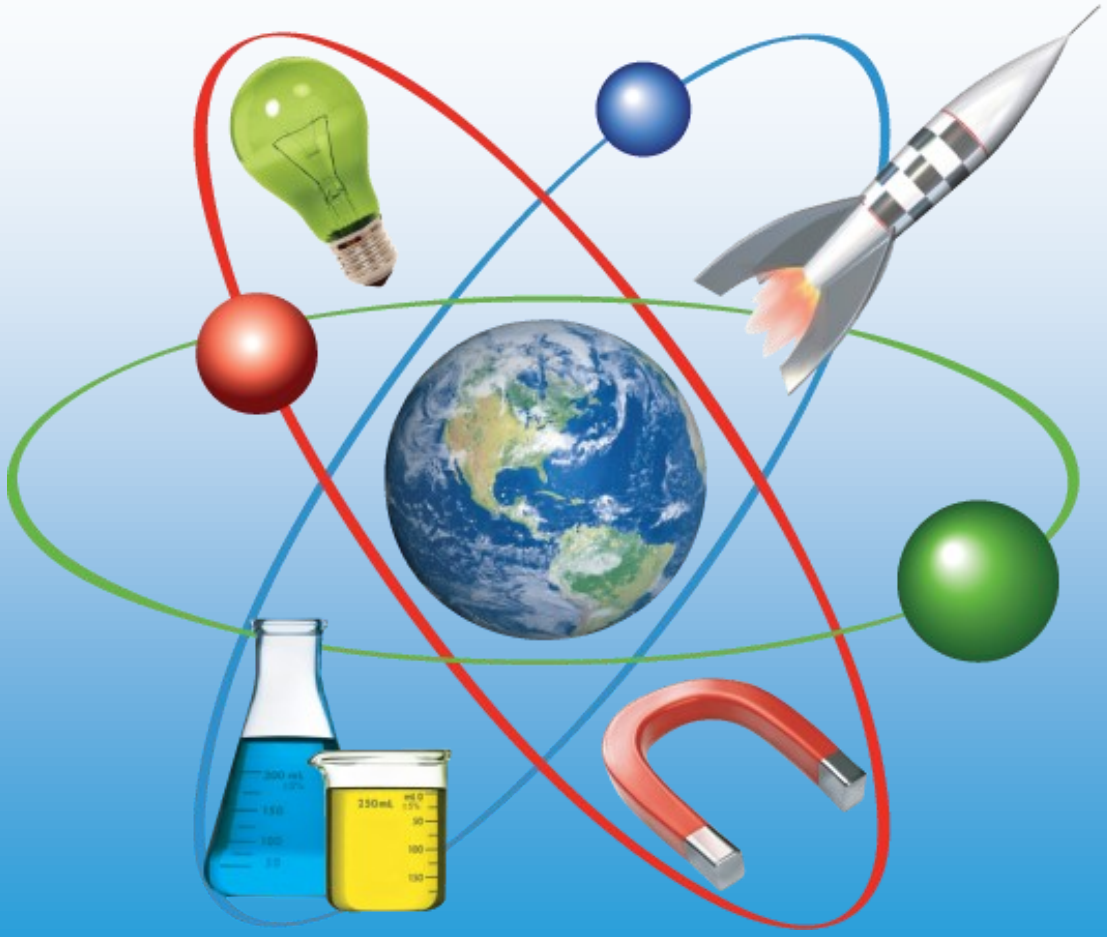
REDDIFORD

December 2018

SCIENCE DIGEST



Welcome to the first exciting edition of Reddiford Science Digest!

Inside this magazine you will find captivating articles bursting with science facts and news, fun puzzles, quizzes and do-it-yourself activities.

Read about tips on healthy living, plastic pollution, famous scientists, engineering and elements.

Contents

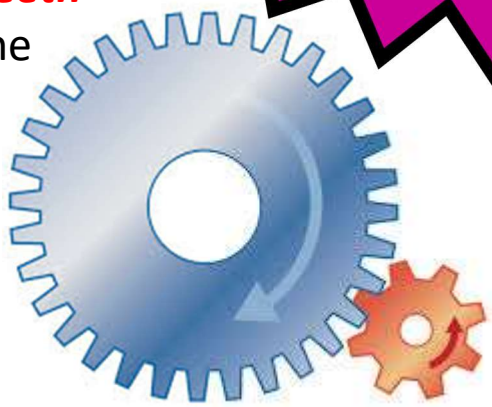
SIMPLE MACHINES

Simple Machines are the foundation of most inventions, and each one either alters the **direction of a force**, or the **amount of force applied.**

DID YOU KNOW?
The six main simple machines were invented by Greek philosopher Archimedes!

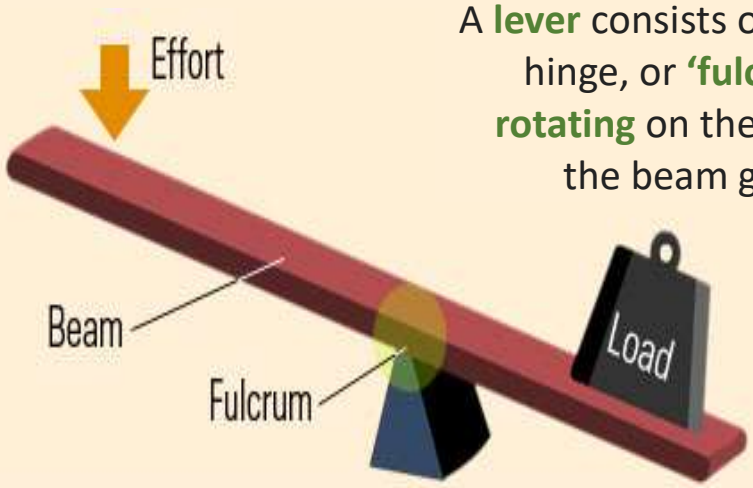
COGS

Cogs are wheels with ***'Teeth'*** [see right] which **link** one cog to another. When one cog turns, the other turns in the **opposite direction**, thus **reversing** the rotational force.

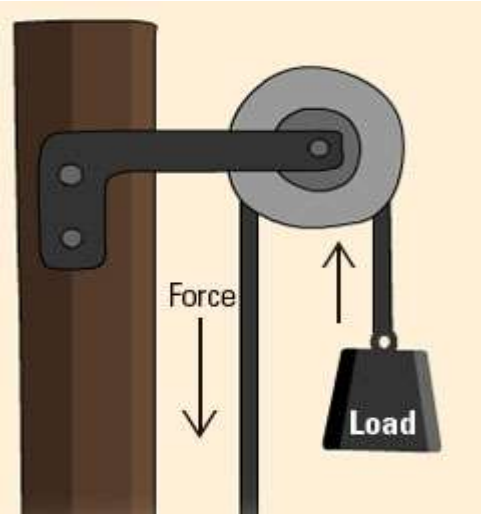


LEVERS

A **lever** consists of a **'beam'** [see left] fixed at a hinge, or **'fulcrum'.** The beam is capable of **rotating** on the fulcrum, so when one end of the beam goes down, the other goes up.



Levers can be used to exert a **large force** over a **small distance** at one end by exerting only a small force over a greater distance at the other.

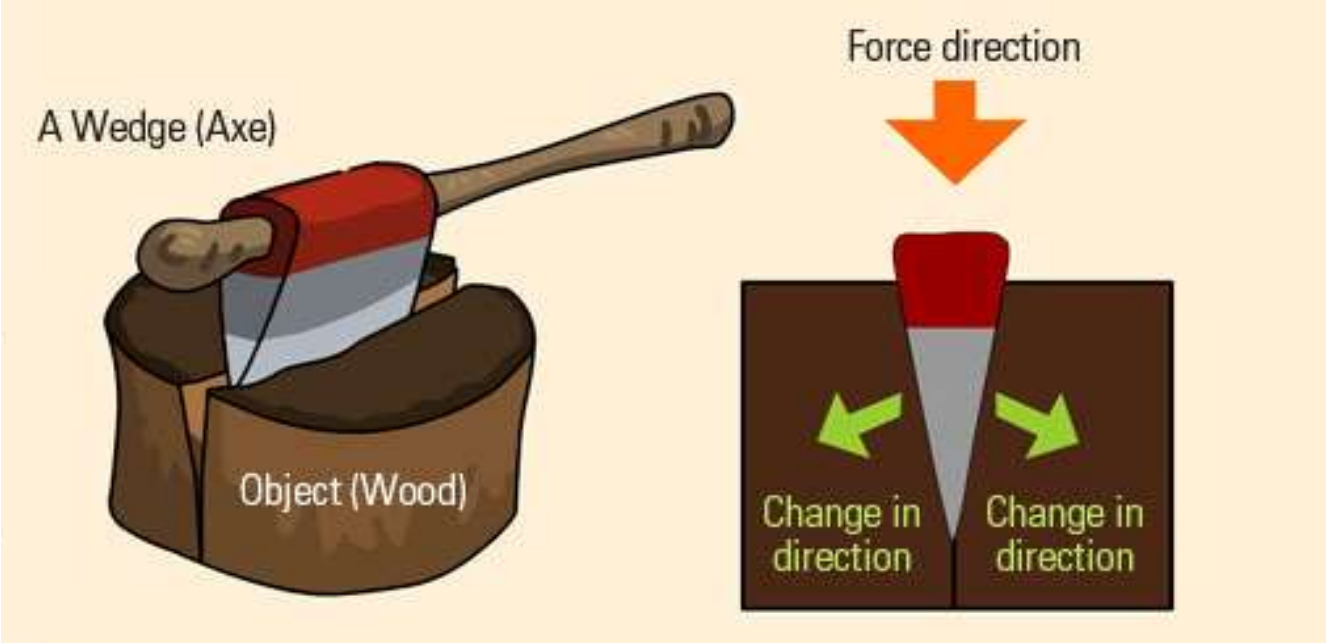


PULLEY

A **pulley** is a **wheel** on an **axel** or **shaft** that is designed to make lifting an object or **'load'** [see right] easier. A pulley has a groove, resting in which is a **rope** or **belt**. The belt dangles from either side of the wheel - one end of it is attached to the load, so when the other is pulled down, the load rises up.

WEDGE

A **wedge** is a triangular shaped tool, which can be used to **split** an object in two. Wedges work by **changing direction** and **force** applied to it [see below]. The **downward** force of the wedge changes direction due to the wedge's **slanted** sides, thus splitting the wood.



WORD SEARCH!

B	E	L	L	P	D	B	G	J	U	W	E	D	G	R	E	T
L	E	H	F	A	D	E	I	O	P	M	N	F	X	Z	R	E
U	V	L	J	I	A	E	S	G	C	R	O	G	L	J	I	E
R	W	U	T	I	F	U	L	C	R	U	M	L	T	E	R	H
S	W	Q	T	U	R	Q	W	C	B	L	A	S	F	M	V	T
X	C	M	U	C	Y	T	F	N	D	H	Y	W	Q	R	D	P
U	C	O	D	B	E	A	M	P	U	L	L	Y	E	H	C	L
C	O	C	M	B	F	M	F	G	B	F	F	O	R	H	E	D
L	G	O	H	N	A	Q	O	K	G	H	P	H	Y	U	P	I
E	T	K	D	I	R	E	C	T	I	U	N	U	H	O	A	R
V	Y	F	O	R	E	C	E	R	L	E	V	E	L	I	L	E
L	R	Y	I	O	P	C	M	L	Z	C	H	K	K	L	L	C
E	O	C	O	C	G	T	E	E	T	H	T	H	E	E	E	T
V	C	G	O	G	O	Y	G	R	P	U	L	E	L	Y	E	I
E	C	R	O	F	J	I	D	G	U	D	J	O	I	L	P	O
R	L	E	V	E	L	E	E	V	E	R	L	E	V	E	L	N
G	F	A	F	I	J	R	W	H	E	E	L	B	E	T	L	H

WORDS:

- Cog
- Teeth
- Lever
- Fulcrum
- Beam
- Pulley
- Wheel
- Belt
- Wedge

SIMPLE MACHINES IN EVERYDAY LIFE

How many can you think of?

e.g. lever = see-saw

DO IT YOURSELF!

All you need is a few basic items of stationery, and you can make a real working lever! Here is what you need:

- A Ruler [preferably 30cm]
- A Pencil
- Something heavy [the heavier the better!]
- A projectile [something light that can be launched]

1. Place the **pencil** flat on the table.
2. Balance the **ruler** on top of the **pencil** with the centre of it [the 15cm point] on the pencil.
3. Place your **projectile** on one end of the **ruler.**
4. Hold the **heavy object** over the other end of the **ruler** and...

TRY THIS !

Try moving the ruler so that it is on the pencil at the 20cm point. What happens differently? How about the 10 cm point?

By Shay Nagda 5B

BOTTLED IN PLASTIC!

Why is plastic pollution a problem?

- At the moment it is estimated that there are 100 million tons of plastic in oceans all around the world.
- There is marine plastic pollution in:
  100% marine turtles
  59% whales
  36% seals
  40% seabird species examined.
- 100,000 mammals and turtles and 1,000,000 sea birds are killed by marine plastic pollution every year.
- About 300 million tons of plastic is produced globally each year and only 10% of that is recycled.
- Of the plastic that is trashed, an estimated 7 million tons ends up in the sea each year.

Did you know that currently 1,000,000 tons of plastic waste is made in the UK, and about 85% of this ends up in a landfill?

Recycle Your Waste

The 4 'R's

Refuse

Reduce

Recycle

Reuse

Only 1 in 5 plastic water bottles are recycled!

- Recycling helps to conserve our natural resources such as coal, oil and gas.
- Recycled paper produces approximately 70% less air pollution than if it was made from raw materials.
- The top three biggest polluters are China, the USA and the EU.
- 91% of all plastic is not recycled.

The average American throws away approximately 185 pounds of plastic per year.

7 fascinating facts about plastic pollution

Coffee cups are lined with plastic to prevent them from disintegrating but making them difficult to recycle.

Families should try to use less single use plastic because much of it goes to waste and some goes into the sea which can harm sea creatures.

It is important that in schools teachers encourage children to recycle and reduce plastic wastage.

Around 12 million tons of plastic is thrown in the oceans every year.

One pile of plastic in the Pacific is the size of France.

People should be motivated to bring their own cups or to buy a reusable cup from the coffee shop.

Did you know that 79% of plastic waste ever produced, has become part of our environment?

How long until it's gone?

It takes around 450 years for a plastic bottle to decompose but sometimes it can take up to about 1000 years.

Researchers have acknowledged that plastic may never actually deteriorate and instead just turn into smaller pieces of plastic.

It takes about 1000 years for a plastic bag to decompose which is why you should be more careful when throwing them away and remember to recycle.

By

Siya Nanavati 5G

and

Kaushalyah Jeyakumar 5B

Carl Linnaeus

Carl Linnaeus is known for his work in Taxonomy, the science of classification and organisms.

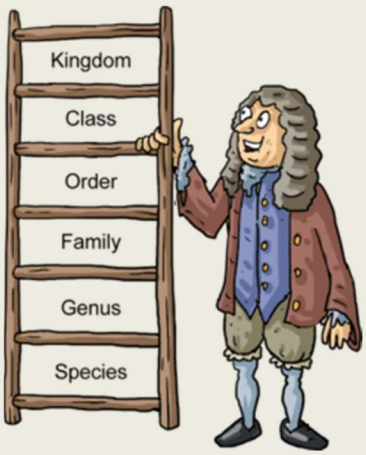
He was born in Sweden in 1707. During his childhood, he was fascinated by botany, which isn't the study of boats, but, in fact, the study of plants.

He studied medicine and botany at Uppsala University. It was during his time here that he started to create his own classification system for plants. He also undertook five expeditions across Scandinavia where he collected new specimens of plants and animals

Around this time, plants and animals had complicated names in Latin so it was very hard to memorise them.

Carl was the first person to develop the Binomial Classification, which greatly improved the way plants and animals were classified by dividing them into two simple categories: genus and species.

The system starts from kingdom, to class, order, family, genus and finally species. There are about 8.7 million species on Earth. But so far only 1.5 million of them have been put into binominal classification. Carl named us *Homo Sapiens,* which means wise man in his book *Systema Naturae* in 1758.



Can you complete this puzzle?

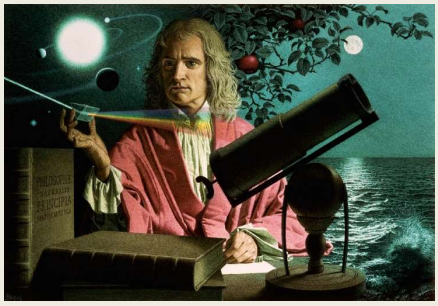
btoayn	Taxonomy
ceispes	Expeditions
pexedtionis	Species
axtonmyo	Botany

When Carl worked at Uppsala University he had many devoted students, seventeen of which he called his apostles. These apostles travelled on expeditions to various dangerous places around the world, sadly, seven of them would never return home.

Carl Linnaeus died on the 10th of January 1778 at the age of 71.

Sir Isaac Newton

Isaac Newton was born in Lincolnshire, England in 1643. His father was a farmer and died three months before his birth. During his childhood, he was enrolled in King's School in Grantham, a town in Lincolnshire. Newton went to Cambridge University where he studied mathematics, physics and astronomy.



One of his famous quotes is: *'I have seen further than others, it is by standing upon the shoulders of giants'.*

He is famed for many of his discoveries and inventions such as:

Gravity - the force which keeps you and me on the ground, all objects are pulled towards the centre of our planet with this force. Newton once said, *'all things that go up must come down'*. He developed his inspiration for this when he saw an apple fall from a tree.

Laws of Motion - he discovered that nothing can move without forces that push or pull. Forces allow cars to move along our roads and rockets to shoot up into the sky.

Calculus - Newton invented calculus. This type of mathematics is essential in engineering and science.

Reflecting Telescope - He invented this telescope in 1668. It uses mirrors to reflect light and form images.

He achieved a **knighthood** in 1705 from Queen Anne during a royal visit to Trinity College, and from then on, he was named 'Sir Isaac Newton'. He died in 1727 in London, England.

a	c	a	m	b	r	i	d	g	e	c	o
n	f	g	r	a	v	i	t	y	i	a	d
e	a	q	t	r	v	b	f	c	x	l	f
w	q	u	e	e	n	a	n	n	e	c	c
t	t	f	o	r	c	e	t	r	e	u	b
o	l	q	d	g	t	e	y	x	z	l	n
n	t	c	o	l	l	e	g	e	m	u	f
b	f	a	r	m	e	r	u	s	n	s	t
e	k	n	i	g	h	t	h	o	o	d	t
d	t	f	w	l	o	l	p	p	u	n	m

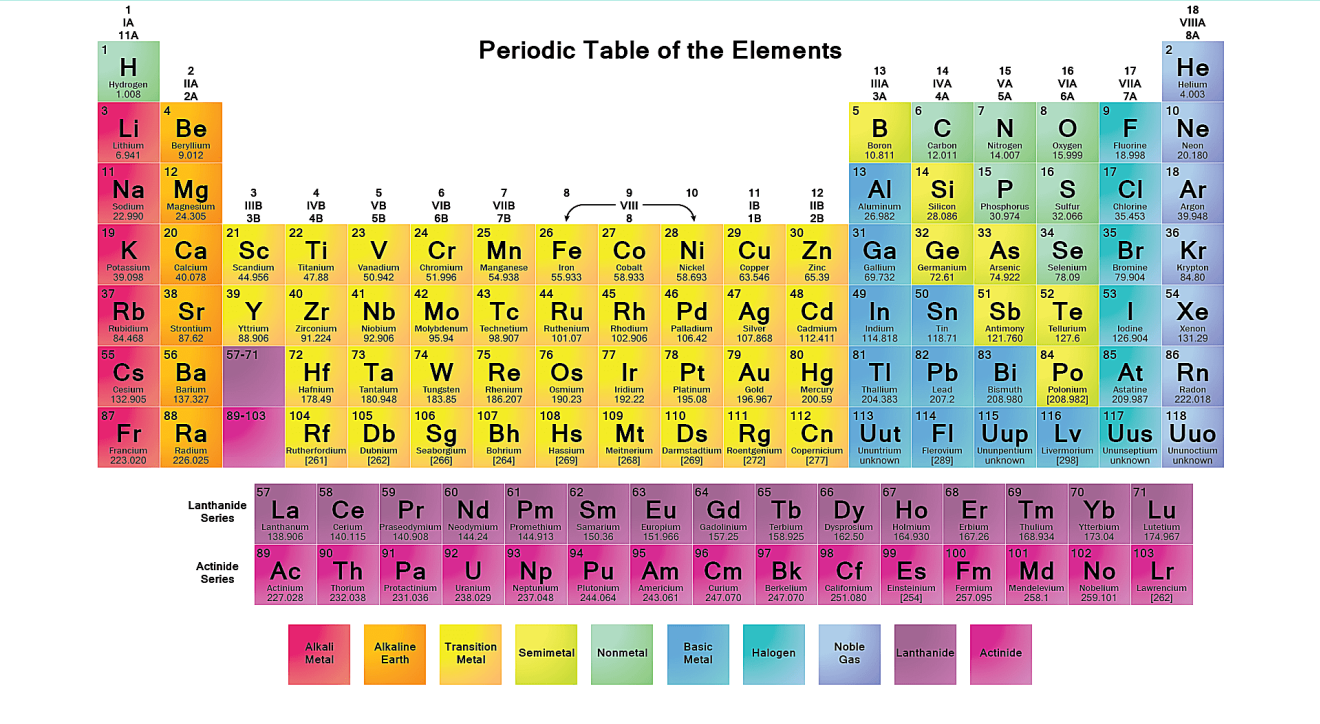
- Farmer
- Cambridge
- Gravity
- Newton
- Knighthood
- College
- Queen Anne
- Calculus
- Force

By Ernest Gresty 5B

World of Elements

What is the Periodic Table?

The Periodic Table contains chemical elements which are arranged in rows and columns. These are grouped together according to their properties, e.g. metals, noble gases or inert gases. Each horizontal row in the table is called a period. Elements are atoms that cannot be broken down anymore.

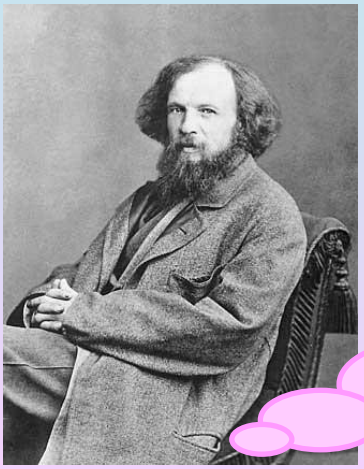


DID YOU KNOW THAT 2019 IS THE INTERNATIONAL YEAR OF THE PERIODIC TABLE?

Who Invented the Periodic Table?

The earliest form of the Periodic Table was created by Alexandre-Émile Béguyer de Chancourtois in 1862. He was the first person to realise that some elements had similar properties.

Did you know that, Alexandre-Émile Béguyer de Chancourtois was from France? He was a geologist and mineralogist. A geologist is a person who studies the structure and history of the Earth and a mineralogist is someone who works with and studies minerals.

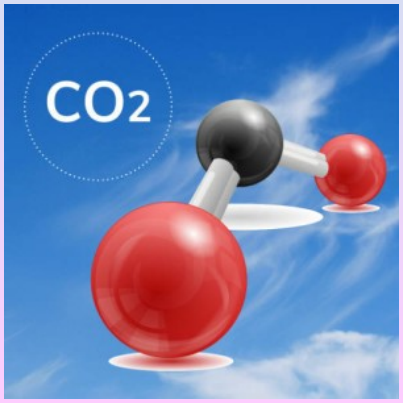


Russian chemist, Dmitri Mendeleev was the first scientist to make a periodic table similar to the one used today. He created his periodic table in 1869 and like de Chancourtois, organised the elements by increasing atomic weight.

The modern periodic table orders the elements according to increasing atomic number, rather than increasing atomic weight. For the most part, this doesn't change the order of the elements, but it's an important distinction between older and modern tables.

Chemicals All Around Us

Did you know that natural mineral water contains the following elements – sodium, potassium, calcium, magnesium, chlorine, sulphur, hydrogen & carbon.



Carbon dioxide is a chemical compound that consists of two oxygen atoms and one carbon atom.

Did you know that chocolate contains more than 300 chemicals?

QUIZ

1. **Who invented the first Periodic Table?**
2. **What is a geologist?**
3. **What is a mineralogist?**
4. **How many chemicals are there in chocolate?**

WORDSEARCH

c	p	e	r	i	o	d	i	c	l
g	h	a	d	u	w	a	l	x	a
e	b	e	p	j	k	m	o	o	r
o	k	o	m	u	u	b	n	m	e
l	m	v	e	i	d	g	h	c	n
o	e	x	d	a	c	s	y	m	i
g	e	o	m	x	f	a	t	o	m
y	s	f	u	w	i	m	l	i	c

Chemicals

Sodium

Periodic

Atom

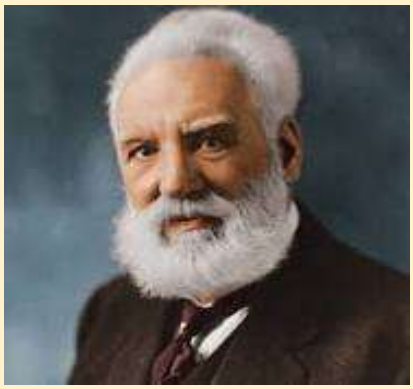
Mineral

Geology

Answers:

1. *Alexandre-Émile Béguyer de Chancourtois*
2. *A person who studies the structure and history of the Earth*
3. *Someone who works with and studies minerals.*
4. *4.300*

Alexander Graham Bell



Why did Alexander Graham Bell invent the telephone?

This is quite an amazing story. He first became interested in the science of sound as both his mother and his wife were deaf. Bell was born on March 3, 1847 in Edinburgh, Scotland. He grew up in Scotland and was initially home-schooled by his father who was a professor. He later attended high school as well as the University of Edinburgh.

His experiments in sound eventually allowed him to send voice signals down a telegraph wire. Wow! He managed to get some money from a few investors and hired Thomas Watson to help him. The two of them together came up with the telephone! Pretty cool. Bell and the people who had lent him money, formed the Bell Telephone Company in 1877.

Many other scientists had very similar ideas and he had to race to the patent office to make sure he was the first one there and that he would be known for inventing the telephone.

The first words spoken were by Alexander on March 10, 1876. Any guesses what he said? Well he said, "Mr. Watson, come here, I want to see you."

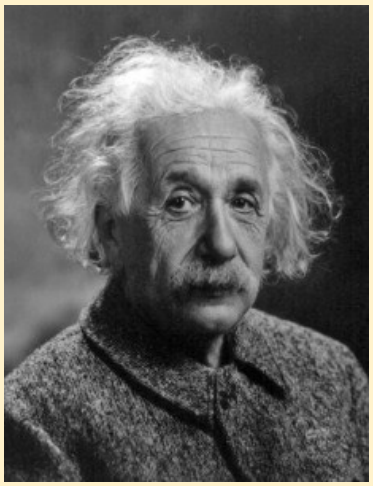
Bell made the first transcontinental telephone call on January 15, 1915. He called Thomas Watson from New York City, who at that time was in San Francisco.

Did you know?

- Alexander Graham Bell helped form the National Geographic Society.
- Bell did not like to have a telephone in his study as he found it was too distracting!
- He did not get the middle name Graham until he was 10 years old, when he asked his father to give him a middle name like his brothers.
- At his wife's request, Bell went by the nickname Alec.
- He died in Nova Scotia in Canada on August 2nd 1922.
- Upon his death, every phone in North America was silenced for a short period to honour him.

Albert Einstein

Albert was a very smart man who was one of the most famous scientists and inventors the world has ever seen, and quite possibly will ever see!



Albert Einstein was one of the most influential physicists of the 20th century. He is most famous for his theory of relativity (and for his wild hair style!).

Albert Einstein was born on the 14th of March 1879 in Germany and moved to the United States in 1933.

Einstein's parents thought he wasn't very intelligent as he spoke very slowly as a child and muttered words to himself. Unbelievably, when his grandmother first saw him, she said he was stupid…little did she know!

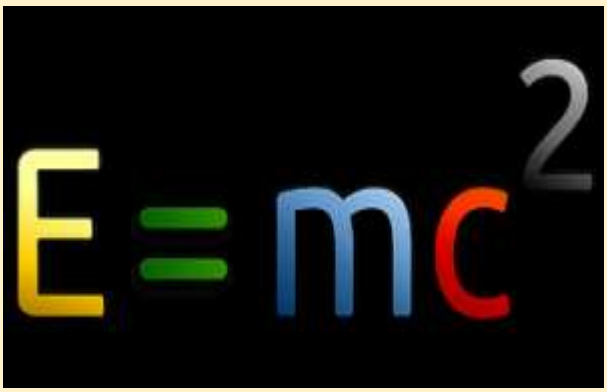
Apparently, he didn't talk until he was four years old, and even then, he would repeat words and sentences over and over again until he was seven.

When he was about five years old his Dad gave him a simple pocket compass, which became his favourite toy! From that day on he became obsessed with magnetism, which is pretty much all about magnets. At the age of seven, he fell in love with mathematics and science. Do you love these subjects? If you do, maybe you'll be the next Einstein!

When Einstein was about ten years old, a friend of his, who was much older than him, gave him a whole heap of books on science, mathematics and philosophy, which is how people think about life.

Apparently, Einstein didn't like the way his grammar school taught him, with all that discipline. He also didn't really care all that much for authority…so he got expelled from a school. Another headmaster also told him that nothing would ever come of him! But by the time he was sixteen years old, he'd published his first scientific paper. Unbelievable! He published over 300 scientific papers before his death in 1955.

Although he wasn't a top student at school in everything, when he got a bit older he certainly made up for it, when he and his family moved to Switzerland. In 1900, he started teaching maths and physics.



Even though he was all over the place, a bit shabby and a little difficult to understand, in 1915 he rocked the world with his Theory of Relativity which was Energy (e) equals mass (m)

times the speed of light, squared (c^2). This proved that even the smallest amount of mass (basically the stuff that's in everything!) can be turned into a huge amount of energy. His theory of relativity has been described as the world's best known theory, and $e=mc^2$ as the most well-known equation. Today's Global Positioning Satellite (GPS) systems still rely on this theory for accuracy.

In addition to his famous theory, Einstein also investigated wormholes, invented a fridge, published a paper on the effects of gravity on light, and played the violin.

Did you know?

- Einstein was just a touch disorganized, so if you are, don't worry, there's hope!
- Einstein had a very poor memory and could often not remember phone numbers and dates. He sometimes couldn't recall his own phone number.
- He charged people for his autograph and then gave the money to charity.
- As an adult, he often forgot appointments and as his amazing brain was all over the place his lectures were a bit difficult to understand.
- He had uncombed hair and never wore socks! Even at posh dinners he would arrive all untidy with crumpled clothes, and of course no socks!
- Einstein loved to use his imagination. He said, "Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world."
- After he died, Einstein's brain was removed and preserved and research was carried out on it to see if there was a reason for his genius!

Fun Quiz

1. What saying did Albert Einstein rock the world with?
2. What did Bell invent?
3. What were Bell's first spoken words on the telephone?
4. Why did Bell invent the telephone?
5. When was Einstein born?
6. When did Einstein start talking?
7. What was Einstein's favourite toy at the age of 5?
8. What were Einstein's two favourite subjects at the age of 7?
9. When was Bell born?
10. Where was Bell born?

By Shayan Dalia-Patel 5G

SCIENCE BEHIND CARS

When most people think of cars, they think of their own luxurious, new cars that take them to school, on holiday and almost everywhere, which is true. Except there's a whole lot more than that to a car. And I mean a **WHOLE LOT** of science!

AMAZING AERODYNAMICS

A plane's curved wings lift it up, but a car's wings push it down. This pushing force on cars is called ***downforce***. If 300,000 kg jumbo jets take off at 180 mph, then *surely* 500kg race cars must take off at 225mph? But they don't, all thanks to downforce.

Downforce is simply air pressing a car down onto the ground. It is essential for ***grip***, stopping crashes and transforming an F1 car into a jumbo jet. Spoilers on a car's body help it do just that.

*Did you know? At top speed, F1 cars' downforce is **so** strong, it can drive **upside down!***

The front spoiler creates 25% of downforce by its slanting shape, pushing air up and the car down.

40% of downforce is created under the car by diffusers that lower air pressure, creating suction/downforce.

The rear spoiler creates 35% of downforce by its slanting shape, pushing air up and the car down.

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PERPLEXING POWERTRAIN

Now, what makes a car move? Well, there is so much to explain, we've abridged it slightly to make it easier for you. Take the Lamborghini below. Cool, right? Now on the left is a ***powertrain*** of the same car. A powertrain is *all* of the parts that make a car move. These include lots of bits, but we're focusing mainly on the steering, engine, gearbox and brakes.

The ***steering wheel*** is not a very complex system, but if you turn, then shouldn't the outer wheel move further/faster than the inner wheel? The problem is solved by differential gears.

The ***engine*** is a crucial part to making a car work. It's pistons turn unbelievably fast, with 300 - 500 explosions every *second!*

The ***gearbox*** is full of complicated cogs and axles, which can change the cars speed, with engines still running at the same speed! Amazing!

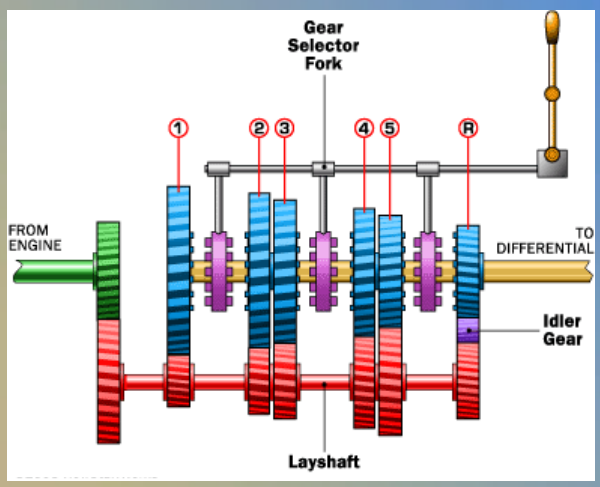
The ***brakes*** are so important in cars. If you couldn't stop a car with the magic word, *friction*, then it keeps rolling on for a long while!

EXHILARATING ENGINES

The pistons pump up and down in the engine *extremely* fast, and it is fire that actually pushes a car because powerful explosions are made in the engine's cylinders, which happen automatically when you put your foot on the pedal.	**The pistons turn a crankshaft, which is a long strong axle connected to the wheels. The pistons are joined with the crankshaft The crankshaft turns a chain attached to a shaft above the pistons.**
Air is injected into the cylinder, along with a *tiny* injection of fuel, and then the pistons move up to squeeze it, and during this time the sparkplug ignites the mixture, creating a force to push the pistons down. The pistons move up again, pushing the smoke out which leaves through the exhaust. It repeats again.	**The spark plug creates electric sparks to burn the fuel with the air in the engine to make an explosion. They are *very* carefully timed by the chain (explained earlier) from the crankshaft, so that it is carefully timed with pistons.**

GRINDING GEARBOXES

Having a ***gearbox*** in a car is like having many cars in one. Did you know, it allows the car to go at a different ***speeds*** while the engine is running at the same speed! But inside is a very complicated set of gears, which are controlled by a ***gearstick***, held by the driver. It results in high efficiency and speed.



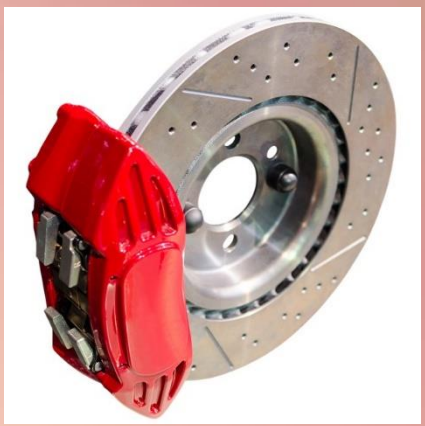
Here's something about ***gears***. When one turns another, the other turns in a ***different direction*** to the former gear. So, reverse gear will mean adding an ***idle gear*** which means reverse gear turns in the ***opposite direction*** which turns the car in the opposite direction.

This is how it works. The engine's ***crankshaft*** turns the gear, before turning the wheels. That gear then turns another set of gears, which turn another set of gears, which are loosely connected to the shaft leading to the wheels via the differential. To select gears, a driver must press the ***clutch pedal*** which disconnects the engine from the gearbox. Now the driver can push the stick, which pushes a ***connector*** onto a certain gear. The connector is actually joined with the ***drive shaft*** so now the gear is connected to the engine and drive shaft. Finally, the driver releases the clutch pedal so that the engine can turn the wheels again but at a different gear.

BOLD BRAKES AND SUPER SUSPENSION

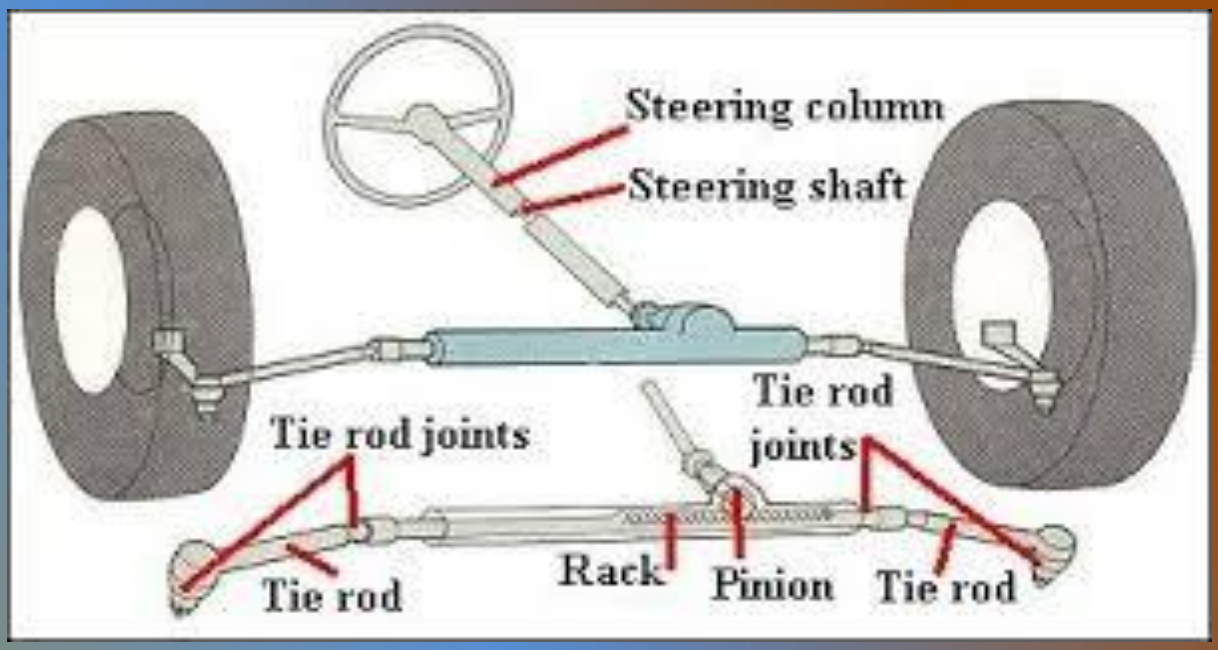
Disc brakes have a disc connected onto the wheel. When the driver pushes the brake pedal, he sends a fluid into a compressed space, which pushes two very strong pads to create friction. Did you know, a formula one car's brakes glow yellow as the car has to stop quickly at such a high speed!

Suspension consists of a spring. This is very useful for a comfortable ride. When you go over a bump, the wheels go up ▲ but the car goes down . ▼ This helps your car have a smooth ride. The spring inside coils up on each wheel. The best suspensions can make a speed bump seem like a crack in the road.



SPECTACULAR STEERING

Steering is used to help vehicles turn around. When you turn the driving wheel, a gear turns a horizontal rack which pushes a part of the wheel, which then turns the front wheels. However, the inner back wheel has to turn slower than the outer one. How is this solved? Well, someone very clever invented ***differential gears***.



QUIRKY QUIZ

1. What keeps a car on the ground? Hint: It's a type of force.
   _____

2. What do you call a steering wheel, engine, gearbox and brakes in a car?
   _____

3. What comes into the engine and what comes out?
   In- _____ and _____ . Out- _____

4. What does a gearbox in a car allow you to do?
   _____

5. What force do brakes require to stop/slow down a car?
   _____

6. What from the list below is used to turn the wheels of a car?
   a. Back and Pinion c. Rack and Minion
   b. Rack and Pinion d. Back and Minion

7. Unscramble the words below (types of alternative fuels).
a) rteclcei _____
b) dornegyh _____
c) elusfiob _____
d) roitnegn _____

By Ishaan Bhandari and Shivam Trivedi 6O

Healthy Living

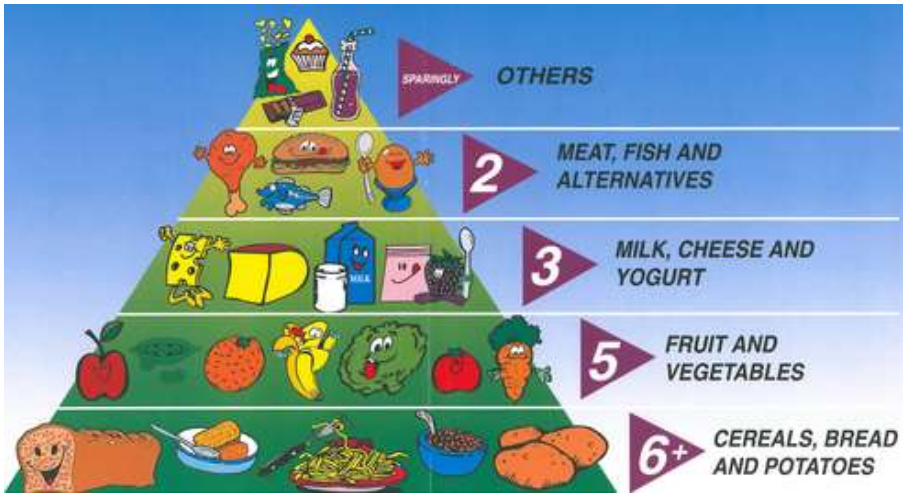
You should not eat too many items containing sugar in one day, but instead have a balanced meal. These are the different types of food groups: carbohydrates, fat, protein, fibre, vitamins and minerals. Some people say that water can also be part of these groups. Generally, the three main food groups are carbohydrates, fat and protein which should be eaten in these proportions:

Carbohydrates: 60%

Fat: 15%

Protein: 25%

This is the healthy eating pyramid:



Fats

Protein

Dairy

Vitamins and minerals

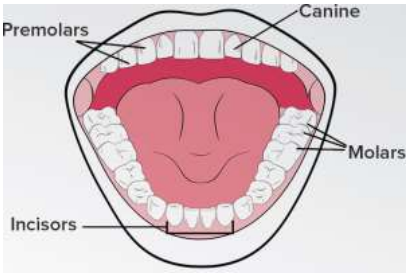
Carbohydrates

If the amount of energy you get from your food is not the same as the amount of energy you need, your diet will not be balanced.

- Not enough food may lead to a person being **underweight**.
- Too much food may lead to a person being **overweight**.

Did you know?

The United States Department of Agriculture (USDA) created the healthy eating pyramid.

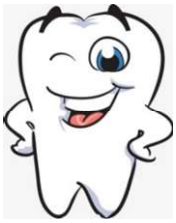


Teeth

In your mouth you have four different types of teeth: incisors, canines, pre-molars and molars. The picture shows how they are arranged in your mouth.

If you don't look after your teeth, the sugars on your teeth will turn into acid and eat into your tooth. This is called tooth decay. Sometimes, you get holes in your mouth which are called cavities. These can be treated by having a filling by the dentist.

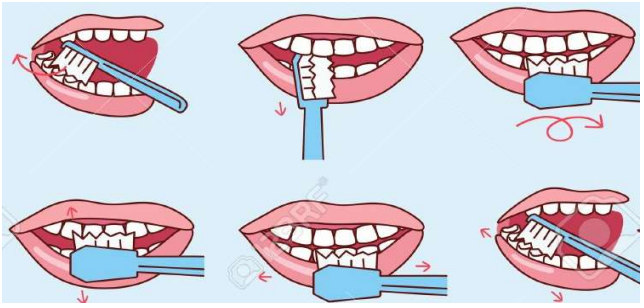
Top tips to look after your teeth



- ✓ Brush at least twice a day; the best time to brush teeth is after meals.
- ✓ Use toothpaste with fluoride.
- ✓ Brush thoroughly to be totally sure that you have got rid of as much plaque as possible.
- ✓ You should stop drinking fluids from a baby bottle when you are 1 year old or before otherwise this can make your milk teeth rot.
- ✓ Put a limit on sugary foods and fizzy drinks.
- ✓ Protect your teeth from injury when playing sports by wearing mouth guards or full face helmets.
- ✓ Go to your dentist twice a year (or more if you have dental problems for example toothache).

And if you can do all of that you will have happy, long-lasting, healthy teeth!

How to brush your teeth:



Below are a few exercises that you can do to stay fit and healthy:

- ✓ Hula hooping
- ✓ Cycling
- ✓ Swimming
- ✓ Skipping
- ✓ Running
- ✓ Scootering

The Benefits of Exercise

Exercise helps to keep your heart pumping and your weight down. It can also reduce anxiety levels, make you feel happy and help you to sleep better.

Quick Quiz

Complete this quiz to test your knowledge on healthy living.

1. What are the four different types of teeth?

2. How many times a year should you go to the dentist?

3. Name three different food groups.

4. What does a dentist do to fix a cavity?

5. What happens if you have too much energy or not enough energy?

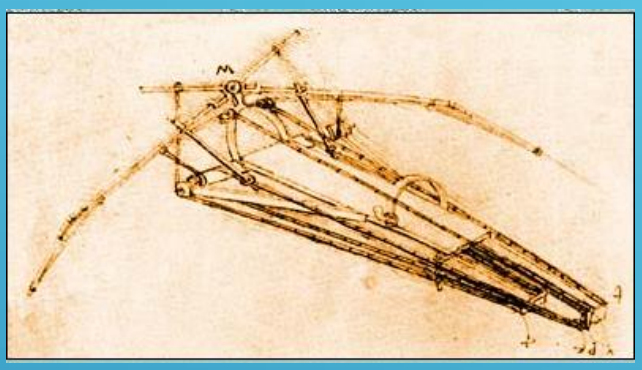
Hint: all answers are in the article

By Mili Shah 6O

HISTORY OF FLIGHT

Here are a few exciting key things that happened in the history of flight. The famous Wright brothers made the first ever powered plane in 1903, that's over 100 years ago! In1930 the jet engine "was made", it's actually argued when it was made but I'll agree with this date. In 1947, a plane managed the amazing feat of travelling faster than sound! This was the first time ever, anything manmade had travelled this fast. The first nonstop, unrefuelled flight around the world, took nine days in December 1986.

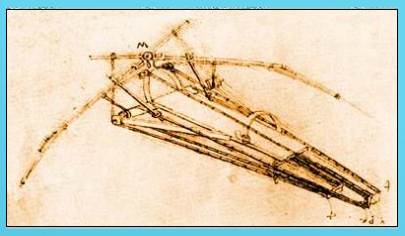
This machine was designed by the famous painter and inventor, Leonardo Da Vinci. It's called an ***Ornithopter***, the pilot was meant to lay down whilst flying but it only got to the design stage and was never actually built.



The first ***flying car***, (roadable aircraft to be exact!) was made in 2001. It can drive along the road, then it's wings will open out and it'll take to the skies. Amazing!

The ***Solar Impulse 2***, is a solar powered plane and is super efficient. Although, being as wide as a jumbo jet, it's as light as a family car. It can fly forever, as it is continually charged up by the Sun's energy during the day. This stored energy can even be used at night time to fly this plane.

THE HISTORY OF FLIGHT QUIZ



1. Leonardo da Vinci designed flying machines between 1485 and 1500. What was the name of this flying machine?
2. Who made the first ever glider?
3. In what year did Orville and Wilbur Wright successfully fly the first powered aeroplane? a) 2008 b) 1903 c) 1840
4. The jet engine was invented in 1930. True or false?
5. The first time an aircraft exceeded the speed of sound was 1947. True or false?
6. The first non-stop flight around the world took 9 days. True or false?
7. In what year was the world's first flying car invented?
    a. 2016
    b. 1989
    c. 2011
8. The Solar Impulse 2 Plane (a solar powered plane) is the weight of a
    a. Family car
    b. Lorry
    c. Wardrobe
9. Does the Solar Impulse 2 plane fly at night?
10. How long can the Solar Impulse 2 Plane fly?

ANSWERS

1. Ornithopter
2. Otto Lilienthal
3. B
4. True
5. True
6. True
7. C
8. A - this is thanks to the lightweight carbon fibre and honeycomb sandwich paper structure material it is made from.
9. Yes - high density batteries store solar power during the day and release energy to the motors for flying at night.
10. It's so efficient that it can fly forever.

By Joshua Griffith 6F

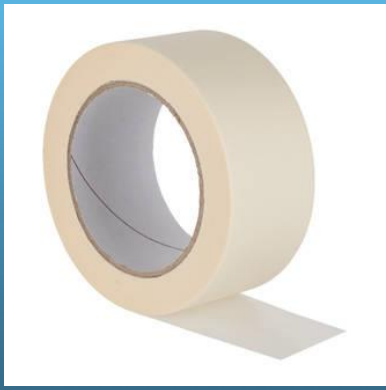
FLY, FLY AWAY!

Ever wondered how an aeroplane could take off or fly?

THE WINGS OF THE PLANE ARE CALLED AEROFOILS AND ARE FLAT AT THE BOTTOM AND ROUNDED AT THE TOP. THE PARTICLES OF AIR TRAVEL FASTER ON THE TOP, CREATING LOWER PRESSURE THAN ON THE BOTTOM AND CREATE A CRUCIAL POINT OF TAKING OFF.

THE WING IS TILTED UP AND THIS MEANS THAT IT FORCES THE AIR UNDER THE WING, ALSO PROVIDING LIFT.

THE FOUR FORCES ACTING ON A PLANE ARE **THRUST** CREATED BY THE ENGINES, **DRAG** CREATED BY AIR FRICTION (AIR PARTICLES SMASH INTO THE FRONT OF THE PLANE, THUS SLOWING IT DOWN), **LIFT**, CREATED BY THE AEROFOILS (WINGS) AND **WEIGHT**, CREATED BY GRAVITY (THE FORCE THAT MAKES A BALL FALL WHEN YOU THROW IT UP IN THE AIR).



Do it yourself!

WHAT YOU NEED:
A POLYSTYRENE PLATE
EIGHT 1P COINS
STICKY TAPE
A PAIR OF SCISSORS (GET AN ADULT TO HELP YOU WITH THIS BIT)

WHAT TO DO:
CUT THE TAPE INTO EIGHT STRIPS, AROUND TWO CM LONG.
THEN, STICK THE EIGHT COINS ONTO THE SIDES OF THE PLATE.

WARNING!
DO NOT THROW AT PEOPLE (OR ANIMALS).

This wing is tilted up to create more lift.

Quiz

1. *Name the four forces that act on a plane while flying?*
2. *What is gravity?*
3. *What is an aerofoil?*
4. *How does an aerofoil lift a plane into the air?*
5. *What is the shape of an aerofoil?*

By Zak Kupfer 6F