Burwell Village College Primary

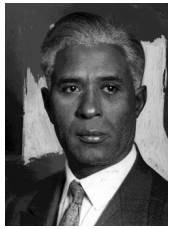
Electricity

Year 4 Ingenious Inventors

Lightning and static electricity are examples of **electricity** occurring naturally but for us to use electricity to power **appliances**, we need to **generate** it. Many every-day appliances rely on electricity for them to work. Some appliances use mains electricity (by being plugged into a socket) and others have a **battery** that makes the work.

Mains powered appliances:

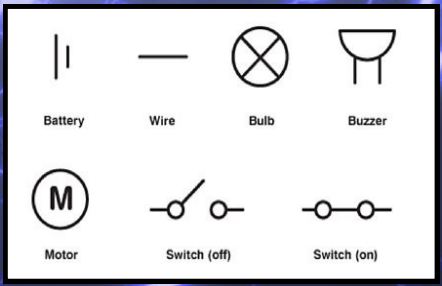
Battery powered appliances:



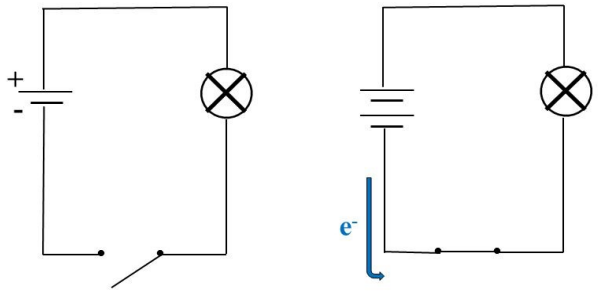
Garrett Morgan was an innovative inventor, engineer and entrepreneur. He called himself the 'Black Edison'.

His design for a breathing hood formed the prototype for the gas masks which saved countless lives in the First World War. He also invented an early form of hair straighteners and created the first design of a three-light traffic light system that we still use

Key Vocabulary	
Word	**Definition**
electricity	the flow of an electric current through a material, e.g. from a power source through wires to an appliance
generate	to make or produce
renewable	a source of electricity that will not run out (these include solar, geothermal, hydro and wind)
non-renewable	this source of energy will eventually run out and so will no longer by able to be used to make electricity (these include fossil fuels—coal, oil and natural gas)
appliance	a piece of equipment or a device designed to perform a particular job, such as a washing machine or mobile phone
battery	a device that stores electrical energy as a chemical
circuit	a pathway that electricity can flow around. It includes wires and a power supply. It may also include bulbs, switches or buzzers



Circuits can be opened or closed by a ***switch:***

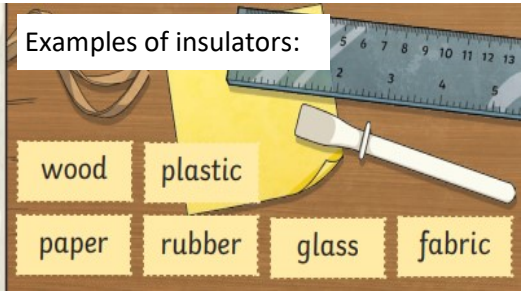


Open circuit (*off*) **Closed circuit (*on*)**

A conductor of electricity is a material that will allow electricity to flow through it. Materials that are electrical insulators do not allow electricity to flow through them.

Examples of conductors:

Examples of insulators:



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Sound

Year 4 Ingenious Inventors

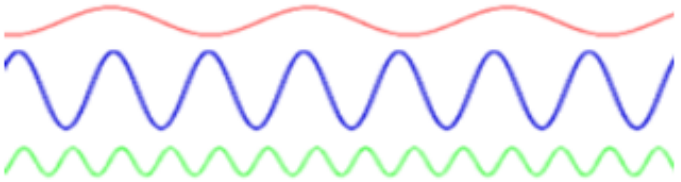
Sound is a type of energy. Sounds are created by vibrations. The louder the sound, the bigger the vibration.

Key Vocabulary	
Word	**Definition**
sound waves	invisible waves that move through the air, water and solid objects as vibrations
decibel	a measure of the strength of a sound wave
volume	how loud or quiet a sound is
pitch	how high or low a sound it
frequency	a measure of how many times per second the sound waves travel
amplitude	a measure of the strength of a sound wave
transmit	to pass from one place or person to another

Alexander Graham Bell (1847 – 1922) was an inventor who studied how vibrating objects make sound. He devised a way of sending and receiving the range of sounds in the human voice. The result was the telephone.

Pitch:

· **High pitch** sounds are created by short sound waves.



· **Low pitch** sounds are created by long sound waves.

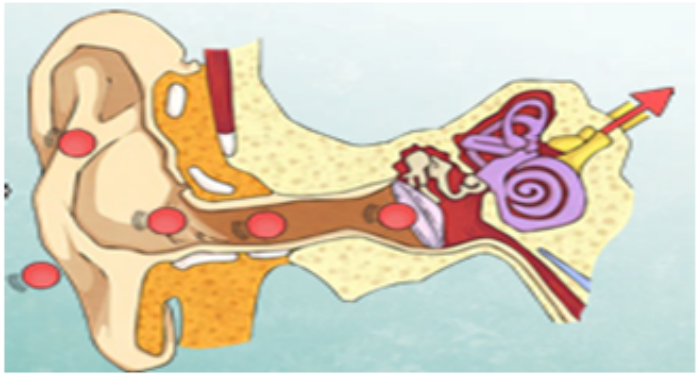
If you throw a stone in a pond, it will produce ripples. As the ripples spread out across the pond, they become smaller. When sound vibrations spread out over a distance, the sound becomes quieter just like the ripples in a pond.

How do sounds travel?

Sound waves can travel through different states of matter (solids, liquids and gases).

When you hit a drum, the drum skin vibrates. This makes the air particles closest to the drum start to vibrate as well. The vibrations transmit to the next air particles, then to the next and the next. This carries on until the air particles closest to your ear vibrate.

Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound.



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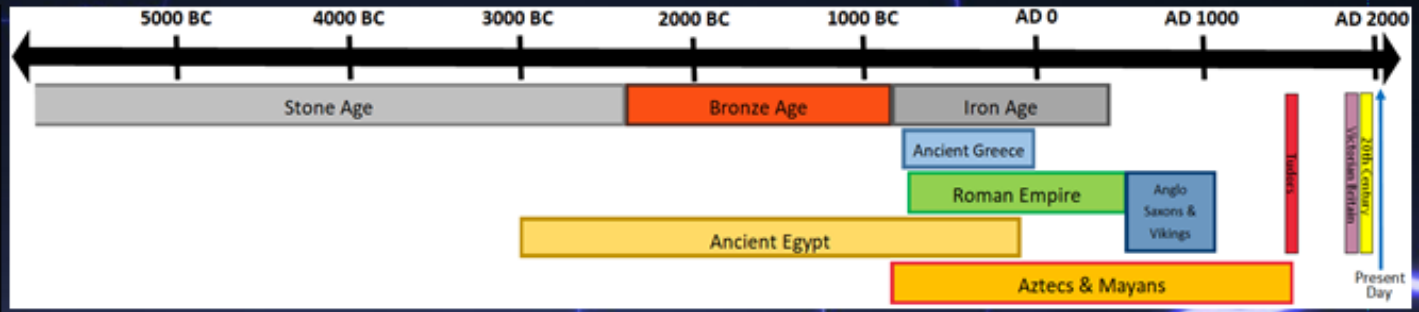
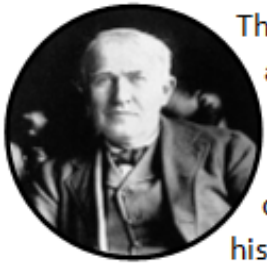
Year 4 Ingenious Inventors

Alexander Graham Bell (1847–1922) was an inventor who studied how vibrating objects make sound. He **devised** a way of sending and receiving the range of sounds in the human voice. This development lead to the invention of the telephone as we know it today.



Alexander Graham Bell's mother and wife were both deaf, whilst both his father and brother worked in areas related to speech. As a result, Bell was interested in the area of speech and sound and worked as a teacher of speech to the deaf.

His research on hearing and speech led him to experiment with hearing devices, which resulted in Bell being awarded the first **patent** for the telephone.



Thomas Edison (1847-1931) was an American inventor and entrepreneur who **invented** many things. He was often called a "wizard" because of his important inventions.

Thomas Edison invented and marketed a design for the lightbulb that was the first to be long-lasting enough to be practical for widespread use. Due to this design, many people believe he was the first person to **invent** the lightbulb.

Key Vocabulary	
Word	**Definition**
invent	to create or design something that hasn't existed before
devise	to plan or invent by careful thought
patent	gives an inventor the right to stop other people from making or using their invention
prototype	a first version of a device from which other versions are developed
technology	the science and art of making things by turning materials of the natural world into objects, tools and machines

Thomas Edison is often credited with the invention of the light bulb. However, there are a number of other people whose scientific discoveries led the way for Edison and his invention.

Through conducting research with the use of **primary, secondary** and **tertiary** sources, the true inventors of the light bulb will come to light.

Examples of Primary Sources
- letters, diaries and journals
- original photographs
- newspaper reports

Examples of Secondary Sources
- textbooks
- essays and reviews

Examples of Tertiary Sources
- databases
- dictionaries and encyclopedias