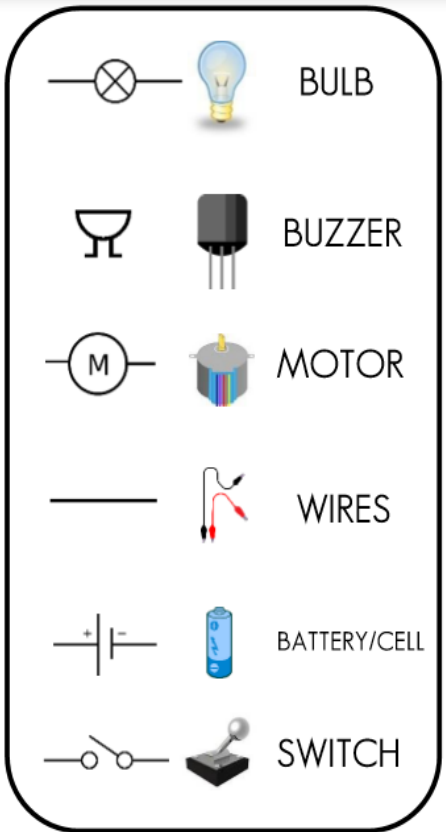
Year 4 Autumn Term Science Knowledge Organiser

KEY QUESTION: How do we create electrical circuits to power different appliances?

Electricity Vocabulary

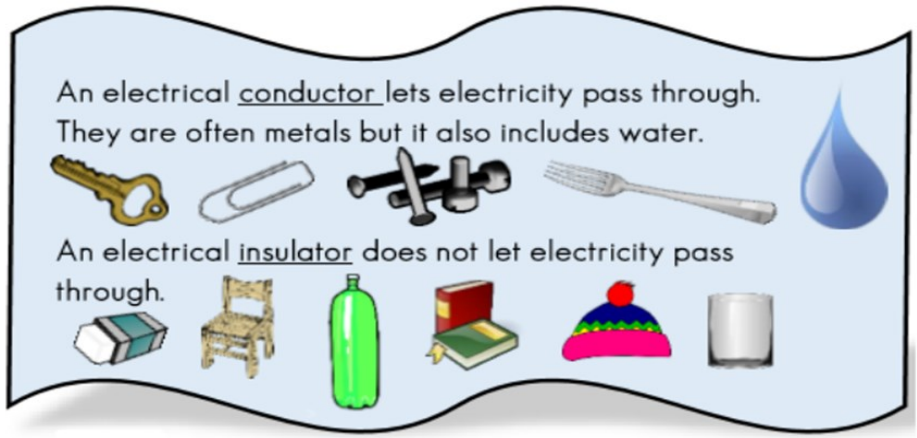
appliance	Component	Fuel	Source
Battery	Conductor	generate	Switch
Bulb	Current	Insulator	wires
Buzzer	Device	Mains	flow
Cell	Electricity	Motor	
circuit	energy	power	



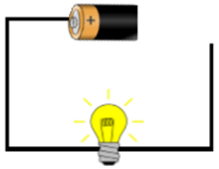
Electricity is a form of **energy** that can be carried by wires and is used for heating and lighting, and to provide **power** for **devices**.

- Some **appliances** use **batteries** and some use **mains electricity**.
- **Batteries** come in different sizes depending on how much and for how long the **appliance** is used.

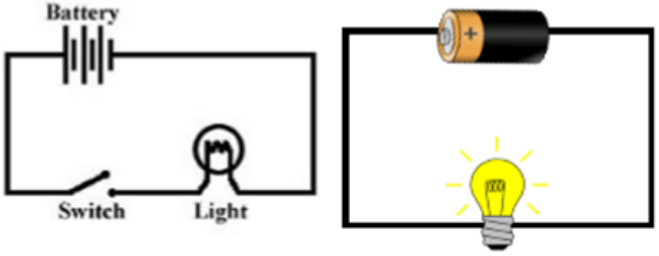
COMMON APPLIANCES



This **circuit** will not work because it is **incomplete.**

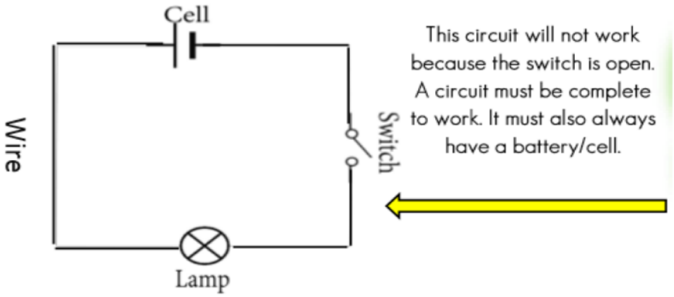


- A **switch** can break or reconnect a **circuit.**
- A **switch** controls the flow of the **electrical current** around the **circuit.** When the **switch** is off, the **current** cannot flow. This is not the same as an incomplete **circuit.**



These are complete **circuits** - they have a **battery (cell)** and a **component (bulb).**
The **wires** are placed in the right places of the **battery** for the **circuit** to work.

- A complete **circuit** is a loop that allows **electrical current** to flow through **wires.**
- A **circuit** contains a **battery (cell), wires** and an **appliance** that requires **electricity** to work (such as a **bulb, motor** or **buzzer**).
- The **electrical current** flows through the wires from the **battery (cell)** to the **bulb, motor** or **buzzer**).



KEY QUESTION: How do we hear different sounds?

VIBRATIONS

Sound is made when an object vibrates and therefore causes the air around it to vibrate too. These vibrations are carried to your ear for you to hear them.

Sound vibrations can travel through different materials:

SOLIDS: metals, stone, wood
LIQUIDS: water
GASES: air

Sound travels better through some materials than others. It travels very well through metal pipes for example.

The louder the volume, the bigger the vibrations. The size of the vibration is called the *amplitude*. Quieter volumes have smaller amplitudes and louder sounds have larger amplitudes.

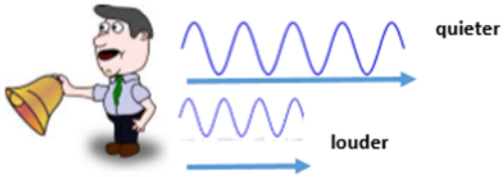
Sounds travel in a *wave*. The vibrations make *air particles* closest to the object vibrate, which then passes the vibrations to the particle next to it and so on – like dominoes falling!

Sound Vocabulary

amplitude	power
decibel	Sound wave
electricity	source
energy	transmit
frequency	travel
medium	vibration
pitch	volume

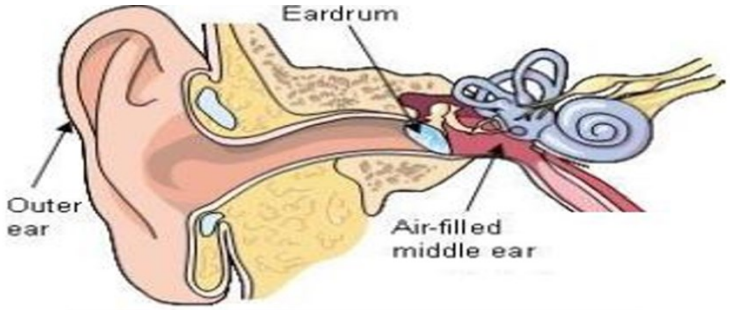
Volume:

- The closer you are to the **source** of the sound, the **louder** the sound will be.
- The further away you are from the **source** of the sound, the **quieter** the sound will be.



- **Amplitude** measures how strong a **sound wave** is.
- **Decibels** measure how **loud** a sound is.
- **Frequency** measures the number of times per second that the **sound wave** cycles.

The vibrating air hits our ear drums and makes them vibrate. The vibrations is picked up by our brains and changed to sounds we recognise.



How do we hear those sounds?

DID YOU KNOW?
Soundproofing is when a material is used to absorb loud sounds. Recording studios or night clubs might use them to stop sound escaping the room! Soft, spongey or pliable material is often best for this.

PITCH

The pitch of a sound is how high or how low it sounds. A high pitch has a high sound and a low pitch has a low sound.

Stringed Instruments
Tighter, thinner or shorter strings make higher pitches. Faster vibrations make pitches high and slower vibrations make pitches low.

Wind Instruments
The column of air inside the instrument causes it to vibrate. Shortening this makes a higher sound, lengthening it makes a lower sound.

Percussion Instruments
The surface is struck and it therefore vibrates. Smaller instruments have higher sounds (smaller keys of a xylophone, hand bells etc.). The tighter or thinner the skin on a drum, the higher the pitch.

Activities to complete at home. ***Bring in your work over the next 4 weeks so it can be celebrated and shared .***

1. Create a poster identify electrical dangers around the home and promote how to stay safe.
2. Research information about Thomas Edison and his discoveries. Create a Fact-File to summarise the info.
3. Make a musical instrument. Explain how to increase or decrease the pitch or volume of the instrument.
4. Investigate which materials are best at sound insulating. Record your findings in a report or vlog.

Pitch:

- **High pitch** sounds are created by short **sound waves.**
- **Low pitched** sounds are created by long **sound waves.**