Year 4 - Science - Electricity

SUBJECT FOCUS: Physics strand	Science: Electricity	YEAR 4	

WHAT? – Key Knowledge

What is Electricity?

Electricity comes from generators. Generators can run from different power sources such as gas, coal, water, solar and nuclear.

Electricity is carried to our homes by electricity **pylons** and cables under the ground.

Electrical **energy** can be changed into other forms of energy such as heat, sound, light and movement.

Anything that needs to be plugged in or uses a battery runs on electricity.

Appliances in our homes such as TVs, computers, vacuum cleaners and microwaves all use electricity.

Electricity can be very dangerous.

Common Electrical Hazards:

- Overloading a plug extension socket.
- Exposed wires.
- Damaged wall sockets.
- Wires left along the carpet for people to trip over.
- Placing metal into electrical appliances or open sockets
- Electrical appliances and wires near water.
- Warning: It is very dangerous to have electrical devices near water.

Electrical Circuits

Electricity can only flow around a complete circuit that has no gaps. There must be wires connected to both the positive and negative end of the power supply / battery.

A **conductor** is a material that allows electricity to flow through it. Metals are often good conductors. Examples include: silver, gold, copper and steel.

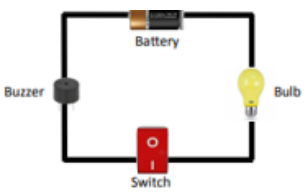
An **insulator** is a material that does not allow charges to flow easily throughout the material. Examples include: rubber, glass and paper.

WHAT? – Key Vocabulary

electricity	The flow of an electric current or charge through a material. For example, from a power source through wires to an appliance.
battery	A device that stores electrical energy as a chemical.
circuit	A path in a loop. A path through which electricity can flow.
Battery	A source of electricity, it uses chemical reactions to create energy.
Insulator	Materials that electricity cannot flow through.
Conductor	Materials that electricity can flow through.
Component	A part of something.
Current	The flow the electricity.
Bulb	A glass ball that lights up inside using electricity.
Motor	A machine that changes electrical energy into movement.
Buzzer	A device that turns electrical energy into sound.
Switch	A device that opens and closes a break in an electrical circuit.
Generate	To make or produce.
Appliances	A piece of equipment or device such as a washing machine or mobile phone.

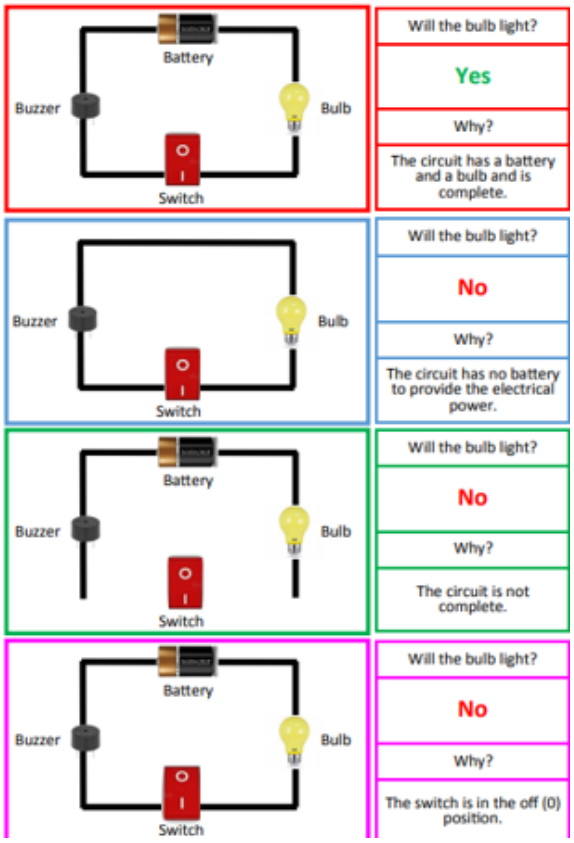
Diagrams and symbols

Label all the components in a circuit. We can draw the wires with straight lines to make the diagram easier to read.



Diagrams and symbols

Will the bulb light up?



Famous Scientist

Thomas Edison was an American scientist. In 1879 he invented the first electric light bulb.

Working Scientifically Challenge:

Let's think like scientists…

Make careful observations and use them to draw a conclusion.

Make predictions about what I think will happen.

Set up a test.

Ask questions and think about how to find the answer.

Use scientific vocabulary.

I wonder…

Can I explain how a bulb might get dimmer?
Can I name some insulators and conductors?
Can I work out which metals can be used to connect across a gap in a circuit?
Can I recognise if a circuit is complete?

Possible experiences: *Curious minds…*

Find out how electricity is useful to use.

Make simple electrical circuits.

Test different circuits and predict if the bulb will light up or buzzer will sound.

Put different materials into a circuit to test if they are insulators or conductors.

Experiment with different numbers of bulbs in a circuit and observe what happens.

Construct a circuit with a switch. Observe what happens when the switch is opened or closed.

Resource

Electricity- Science in a Flash, by Georgia Amson-Bradshaw