

Helping Your Child with the *Electricity* topic

Introduction

As part of the Electricity section of the National Curriculum for Science the children will learn a number of basic ideas. These may seem obvious to us but the children need to use a lot of imagination to get them into their heads. The idea of something invisible (electric current) flowing through wires, for example, is very difficult. Any activities that demonstrate or reinforce these ideas will help them develop the mental agility to deal with new ideas in the future.

This sheet points out the sort of mental blocks that children sometimes have when learning about Electricity. There are also 'Activities'. These are opportunities when you might talk about things they notice around them at home or when they are out with the family. This will reinforce what they do at school and help them realise how their Science lessons relate to everyday life.

Year 2

Useful Vocabulary

Switch – makes or breaks a circuit

Circuit – complete route for electricity to flow round

Connection – linking parts of the circuit

Break – to disconnect (open a gap in the circuit)

Basic Ideas

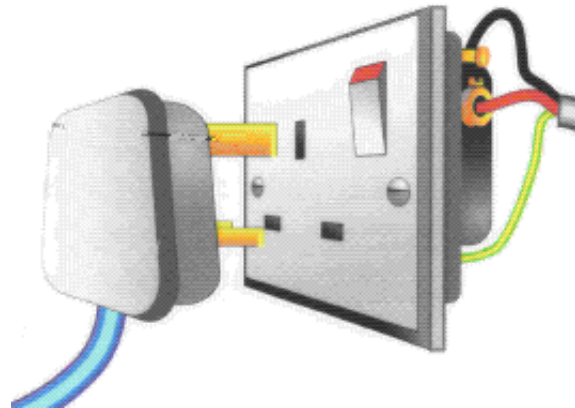
- There are certain items that work because electricity flows to them from the mains. They can be identified because they are plugged into the wall socket. Others work because electricity comes from batteries.

Activity: ask whether a particular device works using electricity and then how they know. This requires them firstly to observe to find the evidence and then to use the phrase 'because...' This is not easy at Year 2 level.

- Mains electricity (from wall sockets) is dangerous. People can be killed or badly burned if they touch plugs with wet hands because electricity can flow through water.

Activity: point out that the light switch for the bathroom is either a pull switch or outside the room and this is because they won't then touch the switch with wet hands and risk being electrocuted.

- Batteries supply electricity to things we want to be portable. These do not pose a risk of electrocution.



Activity: Many toys operate using batteries. (The scientific term is 'cell' but children do not need to use this word). Ask why they think it is a good idea to use batteries instead of mains electricity for their toys.

- For things to work you need a complete circuit for the electricity to flow round. A break in the circuit (such as a switch) stops the flow.

Activity: Children will be used to switching things off but they may not have thought about why the switch works. A switch simply opens a gap in the circuit so the electricity can't flow to the device. Able children will be able to relate the switches they use in school experiments to switches at home and realise they work in the same way.

Year 4

Useful Vocabulary

Electrical Conductor – material (usually metal) that electricity can flow through

Electrical insulator – material (often plastic or rubber) that electricity cannot flow through

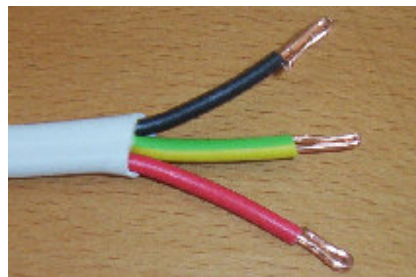
Basic Ideas



plastic coating on the outside and plugs are made of plastic to prevent us being electrocuted

Activity: The ability to observe and question is a very important one in all walks of life. Ask children why things are made of different materials such as plugs, wires, the metal base of a light bulb, the metal filament of a light bulb

and the glass covering. Again the ability to say what it is and explain why is a very important skill at this age.



- Electrical circuits have to be made of electrical conductor – materials that allow electricity to flow. This is why wires are made of metal (usually copper though gold would be better if a little expensive!)

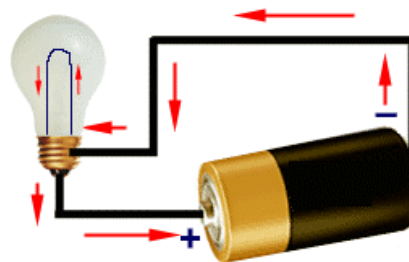
- Electrical insulators (usually plastic) can stop electricity. Wires have a

- Batteries have to be put into a device the right way round so that enough electricity (electric current) flows to the device to make it work. If the battery isn't powerful enough then the device won't work properly e.g. the bulb in a torch won't be bright enough.

Activity: Year 4 children will often have changed batteries in things which means they already identify the fact that the device doesn't work with the need for a new battery. Asking why it is important for the batteries to go the right way round emphasises that electricity flows out of the battery and round a circuit. If two batteries are put into the device in opposite directions the electric current can't flow anywhere because the batteries are pushing it in opposite directions.

Final Point

In primary school children will use standard components including batteries and bulbs to show electricity flowing round a complete circuit. They will also draw circuits. The most important idea they will need, to make sure they are able to understand the more advanced work at Key Stage 3, is the idea that something is moving round the circuit and, if it can't get through for some reason (switch open. Insulator in the way), then the whole thing won't work. At secondary school pupils are introduced to the idea that electric current is made up of electrons (tiny particles) running through wires. This may make it easier to visualise but is not used at KS1 and KS2 levels.



Web Resources

There is an enormous amount of material on the web. The site name may help give you an indication of the quality of the information. Sites ending in '.ac.uk' are usually UK universities, '.edu' are American (US) universities, whilst '.gov.uk', '.gov' and '.mil' are government or military organisations. You can find all sorts of things with a query to a search engine, but here are some to get you started:

<http://www.phys.soton.ac.uk/>

<http://www.chem.soton.ac.uk/>

<http://www.ecs.soton.ac.uk/>

<http://www.parents.dfes.gov.uk/discover/>

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