**Year 4 Science Knowledge Organiser** **Topic: Electricity**

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| **Key questions:** |
| * What components are needed in a circuit in order for it to work properly? What everyday appliances need electricity in order to work? Why would you put a switch in a circuit? What do we notice about the materials that conduct electricity? What do we notice about the materials that insulate electricity?
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| **Key knowledge:** | In both circuits we can see they have a source of electricity (battery).**The circuit on the right is a closed circuit**, meaning the electric current will flow and therefore the bulb will light up. **The circuit on the left is an open circuit**, meaning the electric current cannot flow and the bulb will not light up. |
| * **Electricity** makes all sorts of **everyday appliances** (like computers, mobile phones and radios) work.
* In a **circuit** electricity flows through **wires** to make **components** like bulbs, buzzers and motors work. Electricity comes from a **power source** which is often known as a **cell.**
* A **circuit** will only work if there aren’t any **gaps** in it and everything is **connected properly.** Every circuit also needs a power source to work.
* For a **component to work** in a circuit, it needs to be part of a **complete loop** that starts and ends a cell.
* Using electricity can be **dangerous.** A shock from a mains socket could kill you. Take care and follow some safety guidelines to keep safe.
* A **switch** lets you turn a circuit **on and off.** When switches are closed, electricity can flow and the circuit is ‘on’. When the switches are open, electricity cannot flow and the circuit is ‘off’.
* If something is a good electrical **conductor** this means electricity passes through it easily. If something is a good electrical **insulator** electricity doesn't pass through it.
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| **Key vocabulary:** |
| **Electricity -** Electricity is an energy. This energy can be used to power electrical items such as toasters, kettles, cookers, televisions and computer tablets.**Circuit -** A circuit is a complete path around which electricity can flow**.****Electrical component -** A part in an electrical circuit, e.g. a switch**Switch -** Switches are used to control circuits. They can break a circuit - and so switch bulbs, motors and buzzers off - or complete a circuit - and so switch them on again.**Current -** This is the amount of electricity flowing through the circuit (basically a flow of electrons moving in a loop in the circuit).**Battery -** A battery is a source of energy which provides a push - a voltage - of energy to get the current flowing in a circuit.**Bulb -** A component of a circuit that will light up when connected properly.**Plug -** A device usually on a cord used to make an electrical connection by putting it into another part (as a socket)**Appliance -** A device, machine, or piece of equipment, powered by electricity.**Conductor-** Conductors are made of materials that electricity **can** flow through easily such as metals.**Insulator -** Insulators are made of materials that electricity **cannot** flow through easily such as rubber and plastics. Wires have a metal core and a plastic outer casing for this exact reason! |
| **Output and Working like a scientist:** |
| * To identify a range of circuits and explain whether they allow an electrical current to flow or not.
* To construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
* To construct a circuit and test to see how easily you can break and reconnect a circuit
* Test materials to investigate if they are insulators or conductors.
* Test different ways that we can make a lightbulb brighter.
* To record or results and findings from investigations in various ways e.g. Tables, bar graphs and line graphs.
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