Year 4 - DT Knowledge Organiser

Electrical Systems: Torches

Electrical Products

Electricity is a type of energy used to power electrical items. Electricity occurs naturally in lightning and that it took a long time for people to discover how to capture it and use it for electrical items such as hairdryers and computers. In fact, for a long time, people lived without any electricity.

If it uses mains electricity this might be obvious because it plugs into the wall, but with battery powered devices they may need to pick out other features, such as switches, batteries, bulbs, screens.

Torches

Housing – The main body of the torch, which should be made from a sturdy material as it needs to hold the circuit inside.

Reflector – A reflective surface which lines the head of the torch, making the most of the light from the bulb.

Circuit – You will need to think about how they will keep the circuit safe inside the housing.

Switch – A way to turn the torch on and off.

Design

Think about who the torch is for.
Consider how the circuit would be kept safe inside the main body of the object.
Foam? Bubblewrap? Tying down wires, using string or cable ties?

Make

Start by creating the body for the torch, which should include the handle and the head. The head of the torch should show as much light as possible.

Attaching a paper clip will help you to turn your switch on and off.

The circuit shouldn't just rattle around inside, either use another material to pad out the main body so that the circuit fits snugly inside or attach it to the inside of the handle using something like string or pipe cleaners.

Evaluate

Think carefully about what was successful and what you could improve on next time.
Did you have to change any features of your initial design? If so, why?

What I will know by the end of this topic

- How do I make an electrical circuit?
- How can we draw an electrical circuit?
- How is a switch used in a circuit?
- What was your design criteria?
- How do I combine components together to make a torch?
- What is the importance of conductors and insulators when using electrical circuits?
- Why is it important to plan, annotate diagrams and evaluate a product when designing a DT

Vocabulary	
Battery	Two or more cells put together to provide electrical energy to power a circuit.
Bulb	A circuit part, made from glass or plastic, which gives out light when electricity passes through it.
Buzzer	A circuit part which will make a buzzing noise when electricity is passed through it.
Cell	A single unit that provides electrical energy to power a circuit.
Conductor	A material that allows electricity to flow through it e.g. metal.
Design criteria	A set of rules to help designers focus their ideas and test the success of them.
Electrical item	Objects that need electricity to work, such as hair dryers, toasters and kettles.
Electricity	A type of energy, that is usually invisible, that can made or stored and used to make objects work (for example to move things or to heat them up).
Electronic item	Electrical items that have an element of computer processing in them such as mobile phones and laptops.
Insulator	A material that does not allow electricity to flow through it e.g. plastic.
Series circuit	A closed circuit where the current follows one path.
Switch	A circuit part that you can open or close to allow electricity to flow through or to stop it flowing through. For example, in a house, an electric light switch lets you turn the lights on or turn the lights off.)
Test	To find out whether something works as it should.
Torch	A battery-powered electric lamp.
Wire	A thin piece of copper thread which conducts electricity to connect circuit components together.