Year group: Year 6
Term: Autumn
Subject: Design Technology – Electrical Systems

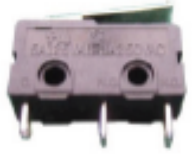
Prior learning

Year 4 Spring Term

Select from and use tools and equipment to cut, shape, join and finish with some accuracy. Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.

Switches and sensors

Latching switch



Micro-switch

Light-dependent resistor (LDR)

Push-to-make switch
When you push, the electricity flows through the circuit, but when you release it the circuit is broken and the switch is off.

Push-to-break switch
The switch is off while the button is pushed, but returns to its 'on' position when button is released.

- Micro-switch – a switch that can operate as push-to-break switch or a push-to-make switch.
- Push-to-break switch – a switch turned off by pressing it.
- Push-to-make switch – a switch turned on by pressing it.
- Reed switch – a switch operated by a magnet.
- Tilt switch – a switch that works when tilted at an angle.
- Toggle switch – a switch operated when a lever is pressed.
- Light dependent resistor (LDR) – a sensor that operates when light is shined on it.

Notes and guidance

Through teacher demonstration and explanation, recap measuring, marking out, cutting and joining skills with construction materials that children will need to create their electrical products.

Drawing on science understanding, ask the children to explore a range of electrical systems that could be used to control their products, including a simple series circuit where a single output device is controlled, a series circuit where two output devices are controlled by one switch and, where appropriate, parallel circuits where two output devices are controlled independently by two separate switches.

Drawing on related computing activities, ensure that children can write computer control programs that include inputs, outputs and decision making. Test out the programs using electrical components connected to Crumble or Micro:bit.

Teach children how to avoid making short circuits.

Children can use a range of skills to design and make a Christmas Toy with an electrical component.

Key vocabulary

Input devices Output devices Function Design Specification

Substantive Knowledge

I know the components of an electrical circuit.
I know how a switch controls a circuit.
I know a range of design technology tools and techniques and how to use them to fulfil the design brief.
I know the technical vocabulary associated with the design.

Disciplinary Knowledge

I know that famous inventors developed ground-breaking electrical systems and components.

Procedural Knowledge

I can formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.
I can competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.

Links to other curriculum areas

Science - electricity

End Points

- To be able to use creativity and imagination to create high quality products.
- To master the use of a range of design technology tools and techniques.
- To be able to design, make and evaluate their products referring to whether it is fir for purpose and meets the design criteria.

Key vocabulary definition.

- **Input devices** – Tools or equipment that let you put information into a computer or system, like a keyboard, mouse, or microphone.
- **Output devices** – Tools or equipment that show or give you the result from a computer or system, like a screen, printer, or speaker.
- **Function** – What something is made to do or what it is used for.
- **Design Specification** – A detailed list of requirements a product must meet, including what it should do, how it should look, and what materials to use.