



Electrical Systems

More Complex Switches and Circuits

Y6

In this unit, we will design, make and evaluate an alarm system for residents to use during a natural disaster.

Knowing More Remembering More:

Remembering previous learning

What is a Push-to-break switch? A push-to-break switch is turned off by pressing it.

What is a push-to-make switch? A push-to-make switch is a switch turned on by pressing it.

What is a toggle switch? A toggle switch is a switch operated when a lever is pressed.

(From science learning)

What is a series circuit? A series circuit is one in which all the components are connected in one continuous loop.

What is a circuit diagram? A circuit diagram is where every component within a circuit is represented by a symbol.

What is a complete circuit? For a circuit to be complete, all the components, including a cell, must be connected by wires and the switch must be closed.

What is an incomplete circuit? The current cannot flow in an incomplete circuit. It may have a break in the wires, a switch may be open or the cell may be in the holder the wrong way.

Skills

I will be able to:

Design:

- 6.2 Use exploded diagrams and cross-sectional diagrams to communicate ideas.
- 6.3 Sketch and model alternative ideas.
- 6.4 Decide which design idea to develop.

Make:

- 6.7 Use a wide range of materials using research to inform decisions.
- 6.8 Use a wide range of tools to measure, mark, cut and assemble accurately.
- 6.10 Refine my product - review and rework/improve.

Evaluate:

- 6.12 Investigate key events and individuals in D&T
- 6.13 Evaluate my product as I make and identify what needs to be improved.
- 6.14 Identify how well the finished product meets the design criteria of the user.

Vocabulary

Technical vocabulary

Series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart

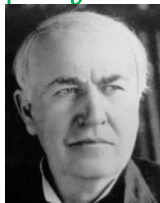
Process vocabulary

Function, innovative, design specification, design brief, user, purpose, names of tools, equipment and materials used

Inspiring Individuals



Edith Clarke



Thomas Edison



Lewis Howard Latimer

Techniques:

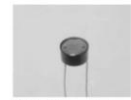
Switches and sensors



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 switch goes off.



Push-to-break switch

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



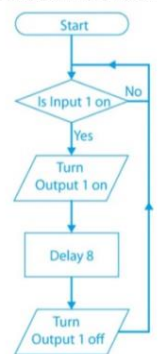
Reed switch
Activated by a magnet which closes the contacts.



Tilt switch
When tilted a ball bearing bridges the contacts inside, completing the circuit.

- 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.

Example control program

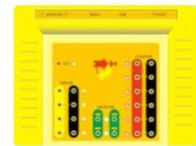


- Children need to learn how to write a sequence of instructions where a decision is made e.g. when a switch is pressed a buzzer is activated.
- They use a 'control language' or create a flowchart to produce a series of instructions.
- Children's computing knowledge and skills need to focus on using input and output devices connected to a standalone box or interface box.
- They use their learning in computing to control and monitor products they have designed and made e.g. alarm system.

Standalone Control Boxes



Interface Control Box



Knowing More Remembering More:

Knowing more in Y6

What is control technology? Control technology is used to operate and create systems and control actions and devices.

What is a reed switch? A reed switch is activated by a magnet which closes the contacts.

What is a tilt switch? A tilt switch completes the circuit when a ball bearing bridges the contacts inside.