



In this unit, we will design, make and evaluate an alarm system for residents to use during a natural disaster. We will investigate and evaluate a range of existing battery-powered alarm systems and a variety of switches, and engage in focused practical tasks which will inform our designing and making. We will test and evaluate our alarms, linking this to the intended purpose. We will also research inspiring individuals in this field.

Electrical Systems Knowledge:

I will:

- Understand and use electrical systems in products.
- Apply understanding of computing to program, monitor and control products.
- Know and use technical vocabulary relevant to the project

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.

Techniques:

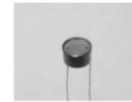
Switches and sensors



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.

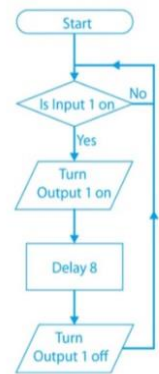


Tilt switch

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



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