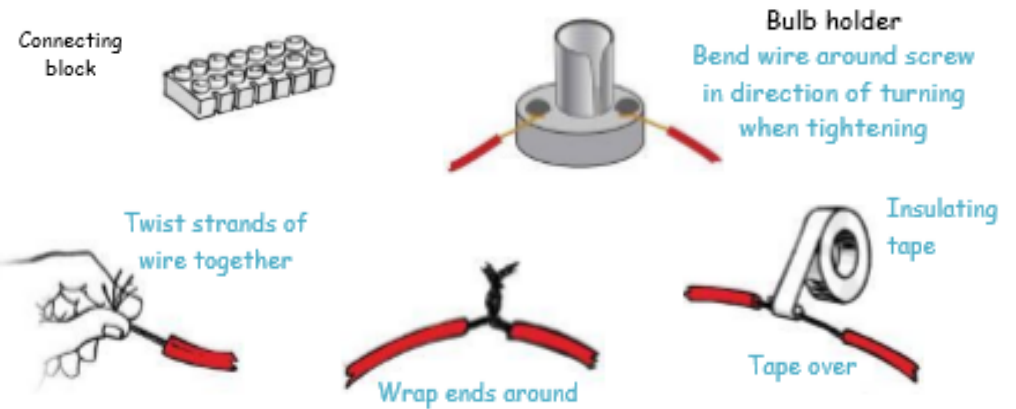## Year 4

Design Brief:

What should I already know?

- Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers.
- Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue.
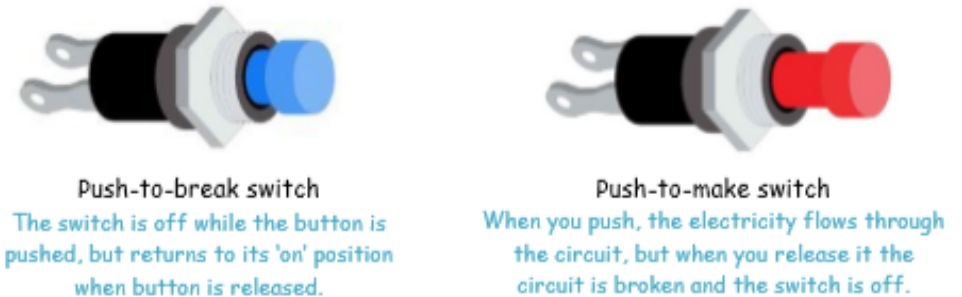
Vocabulary

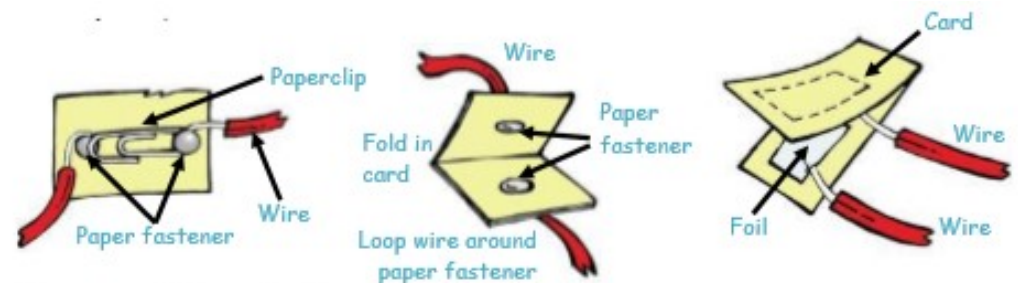|	
Circuit	path through which electricity passes.
Conductor	A material which allows an electric current to pass through it.
Insulator	A material which does not easily allow electric current to pass through it.
Prototype	A model made to test whether a design will work.
Push-to-break switch	A switch turned off by pressing it.
Push-to-make switch	A switch turned on by pressing it.
Reed switch	A switch operated by a magnet.
Toggle switch	A switch operated when a lever is pressed.
System	A set of related parts or components that together achieve a desired outcome.
Output devices	Components that produce an outcome e.g. bulbs and buzzers.
Input devices	Components that are used to control an electrical circuit e.g. switches

Making secure connections:

Connecting block

Bulb holder
Bend wire around screw in direction of turning when tightening

Twist strands of wire together

Insulating tape

Wrap ends around

Tape over

Commercial Switches:

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

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.

Handmade switches:

Paperclip

Wire

Card

Paper fastener

Fold in card

Paper fastener

Wire

Paper fastener

Wire

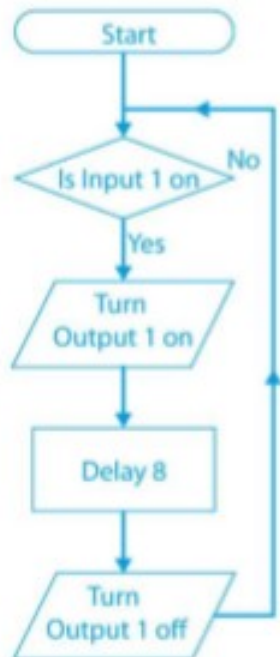Loop wire around paper fastener

Foil

Wire

Year 6

Design Brief:

What should I already know?

- Understanding of the essential characteristics of a series circuit and experience of creating a battery powered, functional, electrical product. (Revised from YR4/5)
- • Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off. (Revised from YR4/5)

Cross curricular

Computing – Design, write and debug programs that accomplish specific goals, including controlling physical systems. Use sequence, selection, and repetition in programs. Work with variables and various forms of input and output.

Key Skills:

problem–solving   teamwork   negotiation

consumer awareness   organisation   motivation

persuasion   leadership   perseverance

other – specify

Example control program:

Control Boxes:

Standalone Control Boxes

Interface Control Box

Vocabulary:

Modelling (revised)	To realise and manipulate ideas in a tangible form
Open switch (revised)	When a switch is positioned such that electricity cannot flow through it.
Closed switch (revised)	When a switch is positioned such that electricity can flow through it.
Normally open (revised)	The term used to describe when a switch is in the off position, i.e. the switch is open and no electricity can flow when the button on not pressed.
Normally closed (revised)	The term used to describe when a switch is in the on position i.e. the switch is closed and electricity can flow when the button is not pressed
Computer control input	When a switch, such as a micro switch, sends a signal to a computer control box to activate a sequence of events such as a buzzer or light being used to attract attention or alert people.
Output devices -	Components that produce an outcome e.g. bulbs and buzzers.
Input devices -	Components that are used to control an electrical circuit e.g. switches or sensors.