
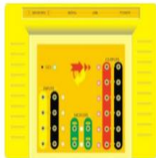
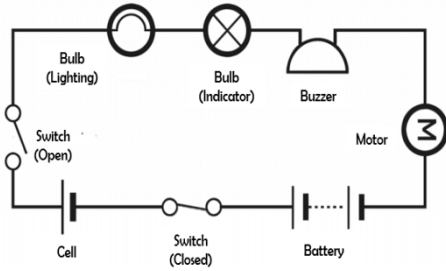
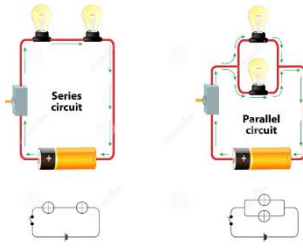


Lunt's Heath Primary School - Knowledge Organiser			
Design Technology Focus	Electrical Systems	Year 6	Term Summer Term

What? (Key Knowledge)	
More Complex Switches and Circuits	
<p>Electricity is a type of energy. It is used to power lots of things</p> <ul style="list-style-type: none"> -Electricity can flow through circuits. A circuit is the path the electric current follows. It must have no breaks in it (a closed circuit) for electricity to flow. The symbols for different objects in electrical circuits are shown on the right. -The electricity flowing through a circuit is known as the current. It can be used to power an output device. -Switches can be positioned so that electrical currents can flow through them (closed switch) or cannot flow through them (open switch). This alters the way that output devices function. -In a series circuit, two output devices are controlled by one switch. In a parallel circuit, two output devices can be controlled separately by switches. <p>Switches can be used alongside control boxes, to set up timed systems (e.g. traffic lights) and monitoring systems (e.g. alarms)</p>	
Practical Examples	
Thomas Edison	Thomas Edison was a famous American inventor, who is best known for inventing the domestic lightbulb and the electrical power system that enables them to work. He investigated new materials for filament that allowed immediate and long-lasting lighting. He also invented safety fuses and on/ off switches for light sockets.
Traffic Lights	The most basic types of traffic lights work on a timer system (e.g. giving a minute of green light in each direction) to ensure that there is a consistent flow of traffic in all directions. This works best in places where there is a consistently busy flow of traffic. In some quieter areas, sensor-based traffic signals use monitoring to detect when there are vehicles. Sometimes this is done with 'inductive loop' systems (a coil in the ground that detects the weight of a car), or sometimes with LDR or video camera systems.
Burglar Alarm	Burglar alarms are another example of a monitoring system. They generally work using micro-switch, LDR, laser, or video camera systems, and can be controlled to act in certain ways (e.g. sounding a buzzer) via a control box.
Designing	
You need to think about who your product is for - what is its purpose and who is going to use it?	
<p><u>Control systems are used in many aspects of modern housing to keep us safe and secure and allow us to monitor our surroundings. You need to design something for the 'House of the Future' to allow the owner to control a system based on the information provided to keep their family safe.</u></p> <p>Consider which type of circuits you will need to use.</p> <p>In a series circuit, there is only one path which the electricity follows. The electricity flows from the input source, around one path (on which the components are positioned) and returns to complete a closed circuit. In a parallel circuit, the components are positioned on different branches of the wire. If one component breaks or becomes disconnected, the other components can still work.</p> <p>In designing you should be able to sketch and annotate different ideas, and should also be able to create either a making checklist, a storyboard, or a flowchart.</p>	

What? (Key Vocabulary)
Equipment Used (Key Vocabulary)
Consider which type of circuits you will need to use!
Micro-switch: a small switch that is extremely sensitive to motion, used in automatic monitoring systems.
Reed Switch: a switch that is operated by a magnet.
Light Dependent Resistor: operates when light is shined on it. As the light increases, the resistance of the device decreases.
Push-to-Make Switch: on when switch is pressed.
Push-to-Break Switch: off when the switch is pressed.
Tilt Switch: A switch that works when held at angle.
Toggle Switch: works when a lever is pressed.
Making
You will need to learn how to write a sequence of instructions using a control program.
This 'control language' or flowchart enables the system to act in a particular way e.g. when a switch is pressed.
You will develop an understanding of using standalone/ interface control boxes:
 
Evaluating
<p>How well does your electrical system work?</p> <p>Does it work as planned?</p> <p>Does it meet its purpose?</p> <p>What would your audience think about your product?</p> <p>What would they like about it?</p> <p>What would they not like?</p> <p>What type of switch did you choose to use? Why?</p> <p>What are the pros and cons of this type of switch?</p> <p>What instructions did you input into your control box?</p> <p>How did this work?</p> <p>What could you still improve about your product?</p> <p>How would you do things differently next time?</p>
Diagrams and Symbols


<p>Example control program</p> <pre> graph TD Start([Start]) --> Input{Is Input 1 on} Input -- No --> Input Input -- Yes --> Output1[Turn Output 1 on] Output1 --> Delay[Delay 8] Delay --> Output2[Turn Output 1 off] Output2 --> Input </pre>

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