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| **Year:** 4 **Program of Study:** Electrical systems – Simple circuits and switches.**N.C POS:*** *Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.*
* *Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams and prototypes.*
* *Select from tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] accurately.*
* *Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.*
* *Investigate and analyse a range of existing products.*
* *Evaluate their ideas and products against their own design criteria.*
* *Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].*

**Concept:** technology, impact, legacy, change, inventions, innovation, application, cause and effect.**Key Vocabulary:** series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device, user, purpose, function, prototype, design criteria, innovative, appealing, design brief.**Prior Learning:** 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.Future learning – More complex circuits Y6 DT |
| **Core Knowledge- non-negotiable****Exploring*** Discuss, investigate and, where practical, disassemble different examples of relevant battery-powered products, including those which are commercially available e.g. Where and why they are used? How does the product work? What are its key features and components? How does the switch work? Is the product manually controlled or controlled by a computer? What materials have been used and why? How is it suited to its intended user and purpose?
* Ask children to investigate examples of switches, including those which are commercially available, which work in different ways e.g. push-to-make, push-to-break, toggle switch. Let the children use them in simple circuits e.g. How might different types of switches be useful in different types of products?

**Designing*** Gather information about needs and wants and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups (Torch, Lamp, Lighthouse)
* Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.
* Mock up – draw design/use IT to explore shapes. Cross section diagram to show internal and external components.

**Making*** Order the main stages of making.
* Elect 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 (bulb/buzzer, wires, battery, container shape/size)

**Evaluating*** Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work (include user and purpose across evaluation – what is effective to your audience? Would they buy this product? Why? If not, how could you improve it?
* Predict what could happen with additional batteries
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| **Wider Influences*** Homes – light switch, tv remotes, chargers, torch
* Travel and holidays
* Cities – street lights, power lines,
* Emergency vehicles – sirens, flashing lights
* School – classroom lights, school bell (if applicable), Smartboard
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| **Enduring Understanding*** Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.
* Apply their understanding of computing to program and control their products.
* Know and use technical vocabulary relevant to the project.
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