Year Group: 6	Unit: Electrical Systems
National Curriculum Aims The national curriculum for design and technology aims to ensure that all pupils: ➢ develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world ➢ build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users ➢ critique, evaluate and test their ideas and products and the work of others	**Technical knowledge** ➢ understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] **Product Outcome** To design and make an intruder alarm.

Prior Learning: Understanding of the essential characteristics of a series circuit and experience of creating a batterypowered, functional, electrical product. • 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.

Curriculum	Learning Intention/possible activities	Knowledge and Key Vocabulary
Investigate and Evaluate ➢ investigate and analyse a range of existing products ➢ understand how key events and individuals in design and technology have helped shape the world	What are alarm systems and how do they work? Explore the purpose of various alarms and record on a mind map. What are the similarities/differences? E.g. sound, light etc. Investigate a range of alarm systems, including how different types of switches are activated (push-to-make, push-to-break)	**Knowledge:** – An open switch is when a switch is positioned such that electricity cannot flow through it. – A closed switch is when a switch is positioned such that electricity can flow through it. – An output device is a component that produces an outcome e.g. bulb or buzzer. – An input device is a component that is used to control an electrical circuit e.g. switches or sensors. – Push-to-break switch is a switch turned off by pressing it. – Push-to-make switch is a switch turned on by pressing it.
Design ➢ use research and develop design criteria to inform the design of innovative, functional,	Which components are appropriate for the purpose of my alarm? Children decide on the purpose of their alarm and consider which switch and components are appropriate.	**Vocabulary:** series circuit, parallel circuit, input device, output device, micro-switch, push-to-break-switch, read switch, tilt switch, toggle switch, LDR (light dependent resistor)

➢ 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, prototypes, pattern pieces and computer-aided design	Design an alarm, including using technical diagrams to represent the required circuit. Make a prototype of their required switch.	system, monitor, control, program, flowchart function, innovative, design specification, design brief, user, purpose
Make ➢ select from and use a wider range of 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	Which tools and equipment are necessary to make my design? Make casing for the product, this could include links to 3D nets in mathematics where appropriate for individual designs. Make circuits and attach them effectively to their casing.	
Evaluate ➢ evaluate their ideas and products against their own design criteria and consider the views of others to improve their work ➢ understand how key events and individuals in design and technology have helped shape the world	How effective is my product? Review product against design criteria Offer and receive constructive criticism	

Thinking Deeper: How has property been protected over the years?

Links to other subjects:

- Subject Specific links- science – electricity, Maths – 3D shapes
- Personal Development – problem solving, resilience
- SMSC – social – working with others to overcome problems, giving and receiving constructive criticism
- Cultural Capital – how properties have been protected over the years
- Careers – electricians
- British Values – law
- Equality – everybody has the right to be safe and secure