DOWN AMPNEY PRIMARY SCHOOL

Term 4
Unit Overview: UKS2 DT
Electrical Systems

National Curriculum Links

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts (for example, the home, school, leisure, culture, enterprise, industry and the wider environment).

When designing and making, pupils should be taught to:

Design

- Use research and develop design criteria to inform the design innovative, functional, appealing products that are fit for purpose, aimed at individuals or groups.
- Generate, develop, model and communicate their ideas through discussion, annotates sketches, cross-sectional and explored diagrams, prototypes, pattern pieces and computer-aided design.

Make

- Select form 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.

Substantive Knowledge

Know how more complex electrical circuits and components can be used to create functional products.

Designing

- ❖ Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost.
- ❖ Generate and develop innovative ideas and share and clarify these through discussion.
- ❖ Communicate ideas through annotates sketches, pictorial representations of electrical circuits or circuit diagrams.

Making

- ❖ Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.
- ❖ Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.

Evaluating

- ❖ Continually evaluate and modify the working features of the product to match the initial design specification.
- ❖ Tell the system to demonstrate its effectiveness for the intended user and purpose.
- ❖ Investigate famous inventors who developed ground-breaking electrical systems and components.

Technical Knowledge

- ❖ Understand and use electrical system in their products, such as series circuits incorporating switches, bulbs and buzzers.

Unit Outcomes

Design, make and evaluate an electric game for friends to play.

Related Learning

Science – apply knowledge and understanding of circuits, switches, conductors and insulators.

Mathematics – apply understanding and skill to carry out accurate measuring using standard units.

Vocabulary

series circuit, fault, connection, toggle, switch, push-to-make, push-to-break, battery, bulb, wire, insulator, conductor, crocodile clip.

Intended Users

Themselves, younger children, older children, friends

Purpose of Products

Safety and security, utility, energy saving.

Key Competencies

problem-solving, teamwork, negotiation, consumer awareness, organisation, motivation, persuasion, leadership, perseverance

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<u>Evaluate</u>

- Investigate and analyse a range of existing products.
- Evaluate their ideas and products 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.

<u>Technical knowledge</u>

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- Understand and use mechanical systems in their products (for example, gears, pullets, cams, levers and linkages).
- Understand and use electrical systems int heir products (for example, series circuits incorporating switches, bulbs, buzzers and motors).
- Apply their understanding of computing program, monitor and control their products.

❖ Apply their understanding of computing to program and control their products.
❖ Know and use technical vocabulary relevant to the project.

<u>Prior learning</u>

❖ Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.

<u>Future application of skills</u>

KS3 : understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]

<u>British Values</u>

<u>Democracy</u>: Children work together to support each other in lessons and children that are more able can be given the opportunity to lead with their own examples of their work. Children take turns both in speech and practically with others. Children understand that it is not always possible or right to have their own way and understand the value of compromise.

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		Children must take the views and opinions of others into account but still have the right to make their own choices. Rule of Law: Children understand the importance of safety rules when using tools. Individual Liberty: Children are taught that DT is a very subjective and personal subject which provides an opportunity to express themselves. The children are encouraged to make decisions with their own design choices, style and sometimes media choice. Children are expected to take responsibility for all of the equipment used when working in DT. Tolerance: Children understand that many great design ideas originate from other cultures. When completing the food and nutrition units, food from different cultures are discussed as well as food that is accepted in different faiths. Mutual Respect: Children are given many opportunities to critique each other's work in a positive and constructive manner whilst showing respect for the opinions and beliefs of their peers which may differ from their own.