

**Term 4**

**Unit Overview: LKS2 DT**

**Electrical Systems**

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| <p><b><u>National Curriculum Links</u></b></p> <p>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).</p> <p>When designing and making, pupils should be taught to:</p> <p><b><u>Design</u></b></p> <ul style="list-style-type: none"><li>• Use research and develop design criteria to inform the design innovative, functional, appealing products that are fit for purpose, aimed at individuals or groups.</li><li>• Generate, develop, model and communicate their ideas through discussion, annotates sketches, cross-sectional and explored diagrams, prototypes, pattern pieces and computer-aided design.</li></ul> <p><b><u>Make</u></b></p> <ul style="list-style-type: none"><li>• Select form and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately.</li><li>• 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.</li></ul> | <p><b><u>Substantive Knowledge</u></b></p> <ul style="list-style-type: none"><li>❖ Use a wider range of materials and components than in KS1, including electrical components.</li><li>❖ To know electrical systems have an input, process and output.</li></ul> <p><b><u>Designing</u></b></p> <ul style="list-style-type: none"><li>❖ Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individual or groups.</li><li>❖ Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotate sketches, cross-sectional and exploded diagrams.</li></ul> <p><b><u>Making</u></b></p> <ul style="list-style-type: none"><li>❖ Order the main stages of making.</li><li>❖ Select from and use tools and equipment to cut, shape, join and finish with some accuracy.</li><li>❖ Select from and use materials and components, including constructions materials and electrical components according to their functional properties and aesthetic qualities.</li></ul> <p><b><u>Evaluating</u></b></p> <ul style="list-style-type: none"><li>❖ Investigate and analyse a range of existing battery powered products.</li><li>❖ Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.</li></ul> <p><b><u>Technical Knowledge</u></b></p> <ul style="list-style-type: none"><li>❖ Understand and use electrical system in their products, such as series circuits incorporating switches, bulbs and buzzers.</li></ul> | <p><b><u>Unit Outcomes</u></b></p> <p>Design, make and evaluate a torch for someone walking their dog at night.</p> <table><tr><td><p><b><u>Related Learning</u></b></p><p>Science – know how to construct simple series circuits and have a basic understanding of conductors, insulators and open and closed switches.</p><p>Spoken language – participate in discussion and evaluation of battery-powered products. Ask relevant questions to extend knowledge and understanding. Build their technical vocabulary.</p><p>Computing – design, write and debug programs that accomplish specific goals, including controlling physical systems.</p></td><td><p><b><u>Vocabulary</u></b></p><p>series circuit, fault, connection, toggle, switch, push-to-make, push-to-break, battery, bulb, wire, insulator, conductor, crocodile clip.</p><p><b><u>Intended Users</u></b></p><p>Themselves, younger children, older childr4en, people who work in the dark, friends.</p><p><b><u>Purpose of Products</u></b></p><p>Safety and security, utility, energy saving.</p><p><b><u>Key Competencies</u></b></p><p>problem-solving, teamwork, negotiation, consumer awareness, organisation, motivation, persuasion, leadership, perseverance</p></td></tr></table> | <p><b><u>Related Learning</u></b></p> <p>Science – know how to construct simple series circuits and have a basic understanding of conductors, insulators and open and closed switches.</p> <p>Spoken language – participate in discussion and evaluation of battery-powered products. 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| <p><u>Evaluate</u></p> <ul style="list-style-type: none"> <li>Investigate and analyse a range of existing products.</li> <li>Evaluate their ideas and products and products against their own design criteria and consider the views of others to improve their work.</li> <li>Understand how key events and individuals in design and technology have helped shape the world.</li> </ul> <p><u>Technical knowledge</u></p> <ul style="list-style-type: none"> <li>Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.</li> <li>Understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).</li> <li>Understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors).</li> <li>Apply their understanding of computing program, monitor and control their products.</li> </ul> | <ul style="list-style-type: none"> <li>❖ Apply their understanding of computing to program and control their products.</li> <li>❖ Know and use technical vocabulary relevant to the project.</li> </ul>  |  |  |
| <p><b><u>Prior learning</u></b></p> <ul style="list-style-type: none"> <li>❖ Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers.</li> <li>❖ Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue.</li> </ul>   | <p><b><u>Future application of skills</u></b></p> <p><u>UKS2:</u></p> <p>Electrical – Monitoring and Control Alarms</p> <ul style="list-style-type: none"> <li>- How more complex electrical circuits and components can be used to create functional products.</li> </ul> | <p><b><u>British Values</u></b></p> <p><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.</p> |  |

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|  |  | <p>Children must take the views and opinions of others into account but still have the right to make their own choices.</p> <p><u>Rule of Law</u>: Children understand the importance of safety rules when using tools.</p> <p><u>Individual Liberty</u>: 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.</p> <p><u>Tolerance</u>: 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.</p> <p><u>Mutual Respect</u>: 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.</p> |
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