**Progress in Design Technology – Electrical Systems**

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|  | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Electrical Systems** |  |  | **Example project:**  **Static Electricity Game**  **Content: Observe the effects of static electricity on different objects. Use static electricity for a project.**  **Design:**  Develop own design criteria.  Design for others and plan production.  Share and clarify ideas through discussion.  Generate realistic ideas.  **Make:**  Use electrostatic energy to move objects in isolation as well as part of a system.  Order the main stages of making.  Follow procedures for safety.  **Evaluate:**  Identify the strengths and areas for development in their ideas.  Consider the views of others.  Use the design criteria to evaluate their completed products.  **Technical knowledge:**  Understand what static electricity means and how to generate it.  Know what a target audience is. | **Example project:**  **Torches**  **Content: Simple circuits. Electrical safety.**  **Design:**  Design for others and plan production.  Use the views of others to improve designs.  Use annotated sketches, some cross-sectional drawings and computer-aided design packages to develop and communicate ideas.  Make design decisions that take account of the availability of resources.  **Make:**  Confidently select suitable tools, materials and equipment and explain their choices giving evidence.  Make a simple electrical circuit.  Order the main stages of making in logical steps.  Follow procedures for safety and hygiene.  Measure, mark out, cut, shape, assemble, join and combine a range of materials and components with accuracy.  **Evaluate:**  Research existing products. Identify the strengths and areas for development in their own and other’s designs.  Refer to their design criteria as they design, make and evaluate.  Investigate and analyse how well products have been made and whether they achieved their purpose.  **Technical knowledge:**  Understand that electricity is energy.  Know that batteries are used to store electricity.  Use correct technical vocabulary – e.g. insulator, conductor, LED, coin cell battery. | **Example project:**  **Electrical greetings card**  **Content: Electrical circuits. Electrical safety.**  **Design:**  Identify target audience.  Apply knowledge to generate designs.  Use annotated sketches, cross-sectional drawings, exploded diagrams and computer-aided design packages to develop and communicate ideas.  Generate innovative ideas from prior research.  Make design decisions based on time, cost and resources constraints.  **Make:**  Make a simple electrical circuit that can be hidden.  Formulate step-by-step plans as a guide to making.  Measure, mark out, cut, shape, assemble, join and combine most materials and components with accuracy.  Accurately apply several finishing techniques including those from art and design sessions.  Be resourceful when tackling practical problems.  **Evaluate:**  Experiment with circuits to consolidate knowledge of function.  Critically evaluate the quality of the design, manufacture and fitness for purpose of their products.  Investigate and analyse how well products have been made and whether they achieved their purpose.  Consider cost and sustainability.  Consider whether materials can be recycled.  **Technical knowledge:**  Know that electrical systems have an input, process and output.  Be able to draw circuit diagrams.  Know the function of different components.  Understand the terminology: insulator, conductor, LED, battery. | **Example project:**  **Steady hand games.**  **Content: More complex electrical circuits. Electrical safety.**  **Design:**  Identify target audience.  Apply knowledge to generate designs using electrical circuits and electromagnetic motors.  Use annotated sketches, cross-sectional drawings, exploded diagrams and computer-aided design packages to develop and communicate ideas.  Model ideas using pattern pieces and prototypes.  Generate innovative ideas from prior research.  Make design decisions based on time, cost and resources constraints.  **Make:**  Measure, mark out, cut, shape, assemble, join and combine materials and components with accuracy.  Select materials for their aesthetic as well as functional properties.  Formulate step by-step plans as a guide to making.  Accurately apply several finishing techniques.  Use resourcefulness, resilience and innovation when tackling practical problems.  Explain next steps in learning drawing from prior experience.  **Evaluate:**  Adapt products during process to improve functionality.  Critically evaluate the quality of the design, manufacture and fitness for purpose of their products. Evaluate their ideas and products against their original design specification.  Investigate and analyse how well products have been made and whether they achieved their purpose.  **Technical knowledge:**  Creating and using electrical circuits in the design.  Know how to make electromagnetic motors. |