

St John & St James' C of E Primary School

Electrical Systems - Skills and Knowledge Progression Document



Nursery			
ELG – Expressive Art and Design: Creating with Materials Physical Development: Fine motor skills, Gross Motor Skills			
<p>Child initiated exploration of a range of construction and design opportunities through continuous provision construction area and separate block play area.</p> <p>Explore different materials freely, in order to develop their ideas about how to use them and what to make.</p> <p>Develop their own ideas and then decide which materials to use to express them.</p> <p>Beginning to develop control with single-handed utensils or writing implements and growing control of simple constructions.</p>			
Reception			
ELG – Expressive Art and Design: Creating with Materials Physical Development: Fine motor skills, Gross Motor Skills			
<p>A construction area in each classroom throughout the year and a separate block area for construction buildings.</p> <p>Free choice junk modelling with a range of connecting including tape, glue, string</p> <p>Make a plan for a project and communicate that plan to others.</p> <p>Explore different materials freely, in order to develop their ideas about how to use them and what to make.</p> <p>Develop their own ideas and then decide which materials to use to express them.</p> <p>Three Little Pigs Ogden Trust experiment. Building bridges using simple materials (lollipop stick and pinch pegs)</p> <p>Refine ideas and develop their ability to represent them.</p> <p>Create collaboratively, sharing ideas, resources and skills.</p>			
Year 4			
Project: Design, Make and Evaluate an electronic game using simple circuits and switches (Electrical Systems)			
Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific users. • Produce annotated sketches, prototypes, final product sketches and pattern pieces. • Make design decisions based on design criteria. 	<ul style="list-style-type: none"> • Plan the main stages of making. • Select and use a range of appropriate tools e.g. cutting, joining and finishing. • Explain your choice of tools and equipment • Include the components needed within a simple circuit. • Consider the use of conductors and insulators within your product design. 	<ul style="list-style-type: none"> • Test their product against the original design criteria • Use design criteria to evaluate their completed products • Use evaluation to suggest improvements in design for future products. 	<ul style="list-style-type: none"> • Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Know and use technical vocabulary relevant to the product • Understand how electricity is generated, travels around a circuit and how to troubleshoot.

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- Investigate and analyse a range of existing battery-powered products.

Key Vocabulary: Series circuit Fault Connection Switch Component Battery Bulb Insulator Conductor

Equipment: Wires, bulb, split pins, crocodile clips, batteries, cardboard, tinfoil, safety pins,

Year 6

Project: Design, Make and Evaluate an alarm system to warn about Tsunamis. (Electrical Systems)

Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • Develop, model and communicate ideas through drawing, templates, mock-ups and prototypes • Design products that are fit for purpose based on a design specification. Understand the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product. 	<ul style="list-style-type: none"> • Formulate and follow step-by-step plans • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished • Accurately assemble, join and combine materials and components. • Understand that circuits must be complete for the current to flow 	<ul style="list-style-type: none"> • Compare the final product to the original design specification. • Test products and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve your work. 	<ul style="list-style-type: none"> • Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Know and use technical vocabulary relevant to the product • Understand how electricity is generated, travels around a circuit and how to troubleshoot. • Understand what a circuit is and what components are needed to create a flow of current.

Key Vocabulary: Series circuit Parallel circuit Switches Cell Current Monitor Circuit break Output Devices Input Devices

Equipment: batteries, crocodile leads, bulbs, bulb holders, buzzers, switches, wires, masking tape, construction materials