


Design and Technology					Unit of Work: Electrical Systems				
		Design Process				Technical Knowledge	Focused Tasks	Key Vocabulary	Meaningful Links
		Prior Learning	Designing	Making	Evaluating				
Y4	Focus: Simple circuits and switches Product: Hands free head lamp User: Ourselves / wider audience Purpose: To give safety and security in the dark	<ul style="list-style-type: none"> Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers. Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue. 	<ul style="list-style-type: none"> Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups. Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. 	<ul style="list-style-type: none"> Order the main stages of making. Select from and use tools and equipment to cut, shape, join and finish with some accuracy. Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities. 	<ul style="list-style-type: none"> Investigate and analyse a range of existing battery-powered products. Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work. 	<ul style="list-style-type: none"> Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. Apply their understanding of computing to program and control their products. Know and use technical vocabulary relevant to the project. 	<ul style="list-style-type: none"> Find a fault in a simple circuit and correct it Use a simple microcontroller program with an interface box or standalone control box to physically control output devices Make a variety of switches Avoid making short circuits 	Circuit Conductor Insulator Prototype Push-to-break switch Push-to-make switch Reed switch Toggle switch System Output devices Input devices	Science Computing Art & Design
Y5	Focus: Pulleys or gears Product: Design fastest car User: Younger children Purpose: Entertainment	<ul style="list-style-type: none"> Experience of axles, axle holders and wheels that are fixed or free moving. Basic understanding of electrical circuits, simple switches and components. Experience of cutting and joining techniques with a range of materials including card, plastic and wood. An understanding of how to strengthen and stiffen structures. 	<ul style="list-style-type: none"> Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. Develop a simple design specification to guide their thinking. Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. 	<ul style="list-style-type: none"> Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. 	<ul style="list-style-type: none"> Compare the final product to the original design specification. Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. Consider the views of others to improve their work. Investigate famous manufacturing and engineering companies relevant to the project. 	<ul style="list-style-type: none"> Understand that mechanical and electrical systems have an input, process and an output. Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. Know and use technical vocabulary relevant to the project. 	<ul style="list-style-type: none"> Investigate combinations of two different sized pulleys to learn about direction and speed of rotation. Explore combinations of two different size gears meshed together. Build a working circuit that incorporates a battery, a motor and a handmade switch, such as a reversing switch. Demonstrate the accurate use of tools and equipment including cutting and stripping wire, and making secure electrical connections. Draw a pictorial representation of the circuit or draw a circuit diagram using correct symbols. Develop measuring, marking, cutting, shaping and joining skills using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames, as appropriate. 	Pulley Gear Drive belt Gearing up or down Mechanical system Driver Follower Mesh Motor spindle	Science