

Electrical Systems

		Year 4 – Torches	
		Kapow Skills and Knowledge Progression	National Curriculum
Skills	Design	Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
	Make	<ul style="list-style-type: none"> • Making a torch with a working electrical circuit and switch. 	<p>Select from and use a wider range of tools and equipment to perform practical tasks (e.g., cutting, shaping, joining, and finishing) accurately.</p> <p>Understand and use electrical systems in their products (e.g., series circuits incorporating switches, bulbs, buzzers, and motors).</p>
		<ul style="list-style-type: none"> • Using appropriate equipment to cut and attach materials. 	Select from and use a wider range of tools and equipment to perform practical tasks (e.g., cutting, shaping, joining, and finishing) accurately.
		<ul style="list-style-type: none"> • Assembling a torch according to the design and success criteria. 	<p>Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design.</p> <p>Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.</p>
	Evaluate	<ul style="list-style-type: none"> • Evaluating electrical products. 	Investigate and analyse a range of existing products
		<ul style="list-style-type: none"> • Testing and evaluating the success of a final product. 	Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Knowledge	Technical Knowledge	<ul style="list-style-type: none"> • To understand that electrical conductors are materials which electricity can pass through. 	Understand and use electrical systems in their products (e.g., series circuits incorporating switches, bulbs, buzzers, and motors)
		<ul style="list-style-type: none"> • To understand that electrical insulators are materials which electricity cannot pass through. 	Understand and use electrical systems in their products (e.g., series circuits incorporating switches, bulbs, buzzers, and motors)
		<ul style="list-style-type: none"> • To know that a battery contains stored electricity that can be used to power products. 	Understand and use electrical systems in their products (e.g., series circuits incorporating switches, bulbs, buzzers, and motors)
		To know that an electrical circuit must be complete for electricity to flow.	Understand and use electrical systems in their products (e.g., series circuits incorporating switches, bulbs, buzzers, and motors)
		<ul style="list-style-type: none"> • To know that a switch can be used to complete and break an electrical circuit. 	Understand and use electrical systems in their products (e.g., series circuits incorporating switches, bulbs, buzzers, and motors)

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	Additional	<ul style="list-style-type: none"> To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. 	<p>Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p> <p>Investigate and analyse a range of existing products</p>
		<ul style="list-style-type: none"> To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. 	<p>Understand how key events and individuals in design and technology have helped shape the world</p>

		Year 5 – Doodlers	
		Kapow Skills and Knowledge Progression	National Curriculum
Skills Knowledge	Design	<ul style="list-style-type: none"> Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. 	<p>Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p> <p>Investigate and analyse a range of existing products</p>
		<ul style="list-style-type: none"> Developing design criteria based on findings from investigating existing products. 	<p>Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p>
		<ul style="list-style-type: none"> Developing design criteria that clarifies the target user. 	<p>Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p>
	Make	Altering a product's form and function by tinkering with its configuration.	Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design
		Making a functional series circuit, incorporating a motor.	Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors]
		Constructing a product with consideration for the design criteria.	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups

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		Breaking down the construction process into steps so that others can make the product.	Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately
	Evaluate	Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.	Investigate and analyse a range of existing products
		Determining which parts of a product affect its function and which parts affect its form.	Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design
		Analysing whether changes in configuration positively or negatively affect an existing product.	Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
		Peer evaluating a set of instructions to build a product.	Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
Knowledge	Technical Knowledge	To know that series circuits only have one direction for the electricity to flow.	Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors]
		To know when there is a break in a series circuit, all components turn off.	Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors]
		To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.	Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors]
		To know a motorized product is one which uses a motor to function.	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
	Additional	To know that product analysis is critiquing the strengths and weaknesses of a product.	Investigate and analyze a range of existing products
		To know that 'configuration' means how the parts of a product are arranged.	Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers, and linkages]