Design and Technology Progression of skills – **Electrical systems (KS2 only)**

		Year 1		Year 2		Year 3	Year 4	Year 5	Year 6
						Electric poster	Torches	Electronic greetings cards	Steady hand game
Skills	Design					• Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas • Generate a final design for the electric poster with consideration to the client's needs and design criteria • Design an electric poster that fits the	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas	• Designing an electronic greetings card with a copper track circuit and components • Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery • Writing design criteria for an electronic greeting card • Compiling a moodboard relevant	• Designing a steady hand game - identifying and naming the components required • Drawing a design from three different perspectives • Generating ideas through sketching and discussion • Modelling ideas through prototypes

						requirements of a given brief • Plan the positioning of the bulb (circuit component) and its purpose		to my chosen theme, purpose and recipient	• Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'
	Make					• Create a final design for the electric poster • Mount the poster onto corrugated card to improve its strength and withstand the weight of the circuit on the rear • Measure and mark materials out using a template or ruler • Fit an electrical component (bulb) • Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge)	• Making a torch with a working electrical circuit and switch • Using appropriate equipment to cut and attach materials • Assembling a torch according to the design and success criteria	• Making a functional series circuit • Creating an electronics greeting card, referring to a design criteria • Mapping out where different components of the circuit will go	• Constructing a stable base for a game • Accurately cutting, folding and assembling a net • Decorating the base of the game to a high quality finish • Making and testing a circuit Incorporating a circuit into a base

	Evaluate					• Learning to give and accept constructive criticism on own work and the work of others • Testing the success of initial ideas against the design criteria and justifying opinions • Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs	• Evaluating electrical products • Testing and evaluating the success of a final product and taking inspiration from the work.	• Evaluating a peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component • Stating what Sir Rowland Hill invented and why it was important for greeting cards • Analysing and evaluating a range of existing greeting cards	• Testing own and others finished games, identifying what went well and making suggestions for improvement • Gathering images and information about existing children's toys • Analysing a selection of existing children's toys

Design and Technology Progression of Knowledge - **Electrical systems (KS2 only)**

		Year 1		*Year 2*		*Year 3*	*Year 4*	*Year 5*	*Year 6*
Knowl						Electric poster	Torches	Electronic greetings cards	Steady hand game

	Technical					• To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit • To understand common features of an electric product (switch, battery or plug, dials, buttons etc.) • To list examples of common electric products (kettle, remote control etc.) • To understand that an electric product uses an electrical system to work (function) • To know the name and appearance of a bulb, battery, battery holder and crocodile	• To understand that electrical conductors are materials which electricity can pass through • To understand that electrical insulators are materials which electricity cannot pass through • To know that a battery contains stored electricity that can be used to power products • To know that an electrical circuit must be complete for electricity to flow • To know that a switch can be used to complete and break an electrical circuit	• To know the key components used to create a functioning circuit • To know that copper is a conductor and can be used as part of a circuit • To understand that breaks in a circuit will stop it from working • To understand that a series circuit only has one path for the electrical current to flow from positive to negative • To know that we use symbols to represent components in a circuit diagram • To know the names of the components in a basic series circuit: crocodile wires, LED (light-emitting diode), battery holder, battery, cell	• To know that batteries contain acid, which can be dangerous if they leak • To know the names of the components in a basic series circuit including a buzzer

						wire to build simple circuits			
	Additional					• To understand the importance and purpose of information design • To understand how material choices (such as mounting paper to corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached).	• To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison	• To know that product analysis is critiquing the strengths and weaknesses of a product • To know that 'mass production' is when a product is made in large quantities by a machine, usually in a factory • To know that one-off production is when only one of a product is made by hand • To know that 'bespoke' means a product was made for a particular reason or person • To understand the development of personal message exchange through to the invention of the Penny Black stamp,	•To know that 'form' means the shape and appearance of an object •To know the difference between 'form' and 'function' •To understand that 'fit for purpose' means that a product works how it should and is easy to use • To know that form over purpose means that a product looks good but does not work very well To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind

								and exchanging of greeting cards • To know that a moodboard may include words, sketches, textures, colours, material samples etc. and can act as inspiration when designing	• To understand the diagram perspectives 'top view', 'side view' and 'back'