

Design
and



Technology

Progression Document

Electrical Systems

EYFS

Key Stage 1

Key Stage 2

Nursery
N/A

Reception
N/A

Year 1
N/A

Year 2
N/A

Year 3

Electric Poster

Year 4

Torches

Year 5

Doodlers
Investigating and making
a functional series circuit,
incorporating a motor

Year 6

Steady hand held game

End Product

Design brief

Design



To create an electric poster using a basic circuit to develop a museum display about The Stone Age.

To design a torch for a particular person. User profiles given in planning.

To investigate an existing product, which uses a motor, to encourage pupils to problem-solve and work out how the product has been constructed, ready to develop their own.

To design a steady hand held game with a specific person in mind and therefore how challenging it will be. It must include a stable base and a working circuit.

- 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 requirements of a given brief
- Plan the positioning of the bulb (circuit

- Design a torch, creating both design and success criteria focusing on features of individual design ideas

- Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product
- Developing design criteria based on finding from investigating existing products
- Developing

- Design a steady hand game - identify and name the components required
- Draw a design from three different perspectives, generate ideas through sketching and discussion
- Model ideas through prototypes

Previous Skills Taught

						component) and its purpose		design criteria that clarifies the target user	
	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)	• Make a torch with a working electrical circuit and switch using design criteria • Using appropriate equipment to cut and attach materials	• Altering a product's form and function by tinkering with its configuration. • Making a functional series circuit, incorporating a motor • Constructing a product with consideration for the design criteria • Breaking down the construction process into steps so that others can make the product	• Construct a stable base for a game • Accurately cut, folding and assembling a net • Make and test a circuit Incorporating a circuit into a base
	Evaluation <i>Evaluate against the design criteria.</i>			•	•	• 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	• Evaluate electrical products • Test and evaluate the success of a final product and take inspiration from the work of peers	• Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses • Determining which parts of a product affect its function and which parts affect its form • Analysing whether changes in configuration positively or negatively affect an existing product • Peer evaluating a set of instructions to build a product	• 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
	Technical Knowledge			•	•	• To understand that an electrical system is a group of parts (components) that work together to transport	• To understand that electrical conductors are materials which electricity can pass	• To know that series circuits only have one direction for the electricity to flow • To	• To know that batteries contain acid, which can be dangerous if they leak • To know the names of the

						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 wire to build simple circuits	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	know when there is a break in a series circuit, all components turn off • To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin • To know a motorised product is one which uses a motor to function	components in a basic series circuit including a buzzer
	Additional knowledge					• 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 'configuration' means how the parts of a product are arranged	• 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 • To understand the diagram perspectives 'top view', 'side view' and 'back'