Digital systems

Kapow objectives verbatim tweaked/additional objectives

	Y4	Y6
Term	Autumn 2	Summer 2
Topic or SA	Titanic – Link to Electricity Science Unit	Lighthouses
Unit title	**Electrical Systems** - Torches	Electrical Systems- Lighthouses
Design skills progression **COMMUNICATION** discussion, annotated sketches, cross-sectional and exploded diagrams.	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	Research the history of lighthouses and how their designs have changed and evolved Design a model/ prototype lighthouse which is functional and aesthetic, giving consideration to the design brief using an annotated sketch.
Make skills progression	• 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.	Make the model/ prototype lighthouse with a working electrical circuit including another input such as an LDR. Apply their understanding of computing to control their product.
Evaluation skills progression	• Testing and evaluating the success of a final product	Test and evaluate their model lighthouse against the design criteria and consider the views of others to improve their work (evaluated by the lighthouse attendant of Lizard Lighthouse)

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Technical knowledge progression	• 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.	how to strengthen, stiffen and reinforce more complex structures (including how to incorporate an electrical system into a structure) understand and use electrical systems in their products apply their understanding of computing to program, monitor and control their products.

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Sequence of lessons	1st = NC Science Electricity Unit to cover circuits and components e.g. a switch. 1 = Evaluate a range of different torches and identify the features of a torch: housing, reflector, circuit and switch. 2 = Create a success criteria and design for a torch. 3 = Make the torch. 4 = Evaluate the torch which includes testing it.	1 Research the design of lighthouses, what they are used for, what features they need and how they have changed over the years. 2. Find out more about John Smeaton and the significant impact he had on the history of lighthouse design 3. Use research to design a lighthouse using an annotated sketch and computer-aided design. Select construction materials according to their functional and aesthetic qualities. 4. Practise specific techniques such as turning boxes inside out and investigate how to cut and join materials effectively 5. Make the lighthouse and incorporate the electrical system. 5 Finishing techniques such as painting to make it look authentic. 6. Test and evaluate the lighthouse, listening to the ideas and suggestions of others.
vocabulary	torch, light bulb, LED, series circuit, battery, cell, wire, copper, switch, conductor, insulator, component, design, success criteria, target audience, evaluate, test, electricity, electrical item, electronic item, input, recyclable, theme	Design brief, functional, aesthetic, prototype, model, junk material cell, wires, sparkle, crumble controller, input, program, output, code, component, join, cut, finish. Light sequence, flash, occult, isophase.

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Tools/equipment	wires, bulbs, bulb holders, batteries, battery holders, foam, bubble wrap, tape, tissue paper, string, recyclable materials or objects, reflective material, card/cardboard, scissors, split pins, paper clips	Crumble sets, junk materials, glue guns, masking tape, staples., split pins, scissors, paper, card, match sticks.
Key events and/or individuals	Additional? To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison	To find out about John Smeaton and the influence he had on the design of lighthouses.