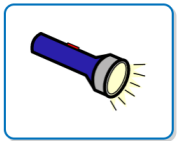
Year 4: Autumn

Electrical Systems: Torches



Enquiry Question	How can we make an object light up using an electrical circuit and switch?	
	Required Prior Knowledge	**Knowledge to be taught**
Substantive Knowledge	• Name the components in a circuit. • Make a simple circuit. • Control a circuit using a switch. • Name some conductors and insulators. • Use drawings to represent their circuits. • Describe how a circuit works. • Name some appliances that run on battery/mains. • Know how to make a bulb brighter. (Y4 Science Electricity)	• Electrical conductors are materials which electricity can pass through. • Electrical insulators are materials which electricity cannot pass through. • A battery contains stored electricity that can be used to power products. • An electrical circuit must be complete for electricity to flow. • A switch can be used to complete and break an electrical circuit. • The features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.
Disciplinary Knowledge		
Design	• Design a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	
Make	• Make a torch with a working electrical circuit and switch. • Use appropriate materials to cut and attach materials. • Assemble a torch according to the design and success criteria.	
Evaluate	• Test and evaluate the success of a final product.	
Vocabulary	**battery, bulb, buzzer, conductor, circuit, circuit diagram, electricity, insulator, series circuit, switch, component, design, design criteria, diagram, evaluation, LED, model, shape, target audience, input, recyclable, theme, aesthetics, assemble, equipment, ingredients, packaging, properties, sketch, test**	

Teaching Sequence				
• *Explore examples* • *Make connections to previous*	• *Model key techniques for children to try*	• *Design own project*	• *Apply skills and knowledge learned to own project*	***ASSESSMENT***

	• *learning* *Make closer observations through sketching*	• *Practise techniques/make a prototype*			*Evaluate own work*
Learning Questions	**What is an electrical system?**	**How does a torch work?**	**Can I design a torch to fit a set of specific user needs?**	**Can I construct the torch that I have designed?**	**Can I evaluate the torch that I designed and made?**
Mastery Keys	➢ Can make a functioning object which lights up and switches on and off.				

Year 4: Spring

Food: Adapting a Recipe

Enquiry Question	How can we adapt a recipe to create a biscuit for a target audience?	
	Required Prior Knowledge	**Knowledge to be taught**
Substantive Knowledge	• Diet means the food and drink that a person or animal usually eats. • What makes a balanced diet • The five main food groups are: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads. • We should eat a range of different foods from each food group, and roughly how much of each food group. • Ingredients means the items in a mixture or recipe (Y2 Food)	• The amount of an ingredient in a recipe is known as the 'quantity'. • Why safety and hygiene are important when cooking. • How to sieve, measure, mix/stir, cut out and shape. • Why budgeting is important while planning ingredients for a recipe. • Products often have a target audience.
Disciplinary Knowledge		
Design	• Evaluate and compare a range of products. • Design a biscuit within a given budget. • Identify a target audience and conduct market research.	
Make	• Follow a baking recipe. • Understand safety and hygiene rules. • Adapt a recipe to meet the requirements of a target audience. • Use a cuboid net to create packaging.	
Evaluate	• Evaluate a recipe, considering: taste, smell, texture and appearance. • Describe the impact of the budget on the selection of ingredients. • Evaluate and compare a range of food products. • Suggest modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).	
Vocabulary	**adapt, addition, appearance, budget, buttery, combine, comment, compare, construct, cream, crunchy, cuboid, cut, design, evaluate, fold, hygiene, ingredients, layout, market research, modify, multiplication, opinion, pounds, sieve, sift, target audience, taste, texture, unique, wooden spoon**	

Teaching Sequence	• *Explore examples* • *Make connections to previous learning* • *Make closer observations through sketching*	• *Model key techniques for children to try* • *Practise techniques/make a prototype*	• *Design own project*	• *Apply skills and knowledge learned to own project*	***ASSESSMENT*** *Evaluate own work*
Learning Questions	**How are biscuits the same and different?**	**How are biscuits made?**	**Can I design a biscuit and stick to a budget?**	**Can I bake the biscuit that I have designed?**	**Can I evaluate the biscuit that I designed and baked?**
Mastery Keys	➢ Can adapt a recipe and create a biscuit that is appealing to a target audience.				

Year 4: Summer Digital World: Mindful Moments Timer

Enquiry Question	How can we program a micro:bit to create a timer?	
	Required Prior Knowledge	**Knowledge to be taught**
Substantive Knowledge	• Selection is a term used in computer programming. • If statements are used to create selection in 2Code • Coordinates are used in computer programming to determine the position of a point, sha • pe or object. • Repeat until is a control block and that blocks of code will repeat until a condition is met. • If/else statements are a conditional command that tests a statement. (Y4 Computing Coding)	• Understand what variables are in programming. • Some features of a micro:bit. • An algorithm is a set of instructions to be followed by the computer. • It is important to check code for errors (bugs). • A simulator can be used as a way of checking code works before installing it onto an electronic device. • What is meant by the terms 'ergonomic' and 'aesthetic'. • A prototype is a 3D model made out of cheap materials that allows us to test design ideas and make better choices about size, shape and materials.
Disciplinary Knowledge		
Design	• Write design criteria for a programmed timer (micro:bit). • Apply the results of research to further inform design criteria. • Develop a prototype case for a mindful moment timer. • Use and manipulate shapes and clipart by using computer-aided design (CAD) to produce a logo.	
Make	• Program a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press. • Test a program for bugs (errors in the code). • Find and fix bugs (debug) in code.	
Evaluate	• Document and evaluate a project. • Gather feedback to make suggested improvements to a product. • Evaluate a program against points on a design criteria and amend them to include any changes made.	
Vocabulary	**advantage, annotate, assemble, aesthetic, block, brand, brand identity, bug, computer-aided design (CAD), clipart, coding, criteria, debug, design, develop, disadvantage, display, ergonomic, evaluate, exhibition, feedback, form, function, join, logo, loop, mindfulness, model, net, program, prototype, research, script, sketchpad, test, timer, user, variable**	

Teaching Sequence	• *Explore examples* • *Make connections to previous learning* • *Make closer observations through sketching*	• *Model key techniques for children to try* • *Practise techniques/make a prototype*	• *Design own project*	• *Apply skills and knowledge learned to own project*	***ASSESSMENT*** *Evaluate own work*
Learning Questions	**How are a product's form and function linked?**	**How is a design brief created?**	**Can I communicate my ideas?**	**Can I program a product to control it?**	**Can I suggest changes to my design based on feedback?**
Mastery Keys	➢ Can program a micro:bit to create a timer and adapt the program according to feedback.				