St Bernadette's Catholic Primary Voluntary Academy

Design and Technology Medium Term Planning - LKS2 Term - Lent Cycle A Topic: Incredible Inventions

Prior Knowledge

Year 3 Children's Prior Knowledge

EYFS	KS1
• Cut and join paper and card	• Cut and join a range of construction materials

Cross Curricular Prior Knowledge

Science: Construct a simple series electrical circuit, in science, using bulbs, switches and buzzers

Year 4 Children's Prior Knowledge

EYFS	KS1
• Cut and join paper and card	• Cut and join a range of construction materials

Cross Curricular Prior Knowledge

Science: Construct a simple series electrical circuit, in science, using bulbs, switches and buzzers

	Learning Objective	Activity	Key Knowledge (By the end of the lesson)		Vocabulary (Tier 3)
			Substantive	Disciplinary	
Lesson 1	L.O. 5 To be able to investigate a range of existing products. Evaluate existing products.	Discuss, investigate and, where practical, disassemble different examples of relevant battery powered products. Noise making toys and a mix of real life board games and self made board games (e.g. wire loop game). Questions Where and why are they used? How does the product work? What are its key features and components? How does the switch work? Is the product manually controlled or controlled by a computer? What materials have been used and why?	• Know that different materials are used depending on their properties.	• Investigate the materials that have been used in making a range of existing products.	Existing product Board game Electrical circuit Design Colours

		How is it suited to its intended user and purpose? Investigate existing products and identify the components they use (e.g. bulb, buzzer, battery, switch) and record on existing products investigation sheet. Write down their likes and dislikes of the games giving reasons for some.			
Lesson 2	L.O. 10 To begin to understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]. Practise making switches	Children to experiment how to make manually controlled, simple series circuits with batteries and different types of switches, bulbs and buzzers. Types of switch to explore - toggle switch, push switch and pressure switch. Discuss which of the components in the circuit are input devices e.g. switches, and which are output devices e.g. bulbs and buzzers. Demonstrate how to find a fault in a simple circuit and correct it, giving pupils opportunities to practise. Use a simple computer control program with an interface box or standalone control box to physically control output devices e.g. bulbs and buzzers. Ask the children to make a variety of switches by using simple classroom materials e.g. card, corrugated plastic, aluminium foil, paper fasteners and paper clips. Encourage children to make switches that operate in different ways e.g. when you press them, when you turn them, when you push them from side to side. Ask the children to test their switches in a simple series circuit. Teach children how to avoid making short circuits.	• Know the difference between input (switches)/ output (buzzers and bulbs) devices. • Know that a simple circuits need a power source (battery), an energy receiver (eg lightbulb) and an energy pathway (eg wire)	• Use a range of equipment to build a simple circuit. • Make different switches using a variety of materials.	Switches Bulbs Battery Wires Buzzers

Lesson 3	L.O. 2 To be able to generate, develop, model and communicate their ideas through discussion, annotated sketches, pattern pieces and computer-aided design. Design a game	Introduce the design brief: To make a Light Up Game for KS1 children to keep them entertained at wet playtimes. Discuss the product, user and it's purpose to develop design criteria. Children to develop a plan of their game. Record their ideas as annotated sketches and cross sectional drawings. Design a front cover for their game.	•	• Develop and follow simple design criteria. • Design innovative, functional and appealing products that are fit for purpose and aimed at a target market. • Use annotated sketches and cross-sectional drawings to develop and communicate their ideas.	Design Criteria Annotated Sketches Purpose Audience Safety features
Lesson 4	L.O. 11 To begin to apply their understanding of computing to program, monitor and control their products. Use CAD to create a circuit	Children to create their electrical circuit on Tinkercad to demonstrate how the electrical components will come together. The design will be printed and stuck into their books. Designs must contain a switch, a buzzer or a bulb. HA children will aim to use more than one of at least one of the above.	• To Know how to design a circuit on a computer..	• Use a computer program to design products.	Program Monitor Control
Lesson 5	L.O. 10 To begin to understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]. Construct the final product	Children create their game using materials brought in from home. Cardboard to be used as the foundation for the game and tin foil to be used as the conductor. Children follow their design criteria created in Lesson 3 or make amendments where they deem necessary. A buzzer or a switch to be included as part of the final product	• Know what their design criteria is (Lesson 3) and ensure they follow it. • Know the steps of how to make a simple circuit to make a game.	• Use a range equipment safely, appropriately and accurately to complete their game. • To follow the design criteria.	Create Conductor Switches Bulbs Motors

Lesson 6	L.O. 6 To be able to evaluate their ideas and products against their own design criteria and begin to consider the views of others to improve their work. Evaluate the game	Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.	• Know what their design criteria was. • Know the importance of evaluating their final product.	• Identify the strengths and areas for development in their products. • Consider the views of others, including intended users, to improve their work. • Use their design criteria to evaluate their completed products.	Evaluate Design Criteria Assess