



South Gosforth First School
Design & Technology – Year 4 Long Term Plan



Purpose of Study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

In line with the National Curriculum for Design Technology it is our aim to ensure that all pupils:

- Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- Critique, evaluate and test their ideas and products and the work of others
- Understand and apply the principles of nutrition and learn how to cook.



Autumn	Electric Posters (Electrical Systems)		
Character Culture Creativity Challenge	Prior Learning Pupils will be carrying out this unit alongside their science learning on electricity. They are familiar joining materials and will have learned which materials can conduct electricity and which can't. They will have already completed their history unit on the Romans in Britain and so will be able to apply that subject knowledge.		
	Key Learning Intentions (Skills) Design: To generate a final design for the electric poster with consideration to the client's needs and design criteria. To plan the position of the circuit and its purpose. Make: To mount the poster on corrugated card to improve strength. To measure and mark materials using template or ruler. To fit electrical component. Evaluate: To give and accept constructive criticism. To test the success of initial ideas and justify opinions. To revisit the requirements of the design brief to review design ideas.		
	Key Learning Intentions (Knowledge) To know... • an electrical system is a group of parts (components) that work together to transport electricity around a circuit. • common features of an electric product (switch, battery or plug, dials, buttons etc.). • examples of common electric products (kettle, remote control etc.). • an electric product uses an electrical system to work (function). • the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits.	Key Vocabulary design criteria, self assessment, peer assessment, feedback, research, initial ideas, sketch, develop, final design, electrical system	
	Overview of outcomes Children will understand what 'information design' is and understand its impact, considering what could happen if we had no signage, posters, or written communication in public places of interest. They will use their subject knowledge from their Ancient Roman history unit on which to base their initial poster ideas. They will complete design criteria based on a client's request, roughly sketching four initial poster ideas, indicating where a bulb will be located for each. They will review their initial ideas against the design criteria and peer feedback, developing a final design. They will assemble an electric poster, including a functional simple circuit with a bulb, mounting the poster using corrugated card. Finally, they will evaluate their electric posters in a letter to a client.		
	Milestones of Learning		
	Information design	Children will: name examples of information design, explain the purpose of information design, describe or explain the importance of information design.	
	Topic research	Children will: research and select a topic to inform the design ideas, write a paragraph about the chosen topic, sketch initial ideas for the electric poster that meet the design criteria.	



	Design development	Children will: review their initial ideas against the design criteria, provide and respond to peer feedback, develop an initial idea into a final design, evaluate the final design against the design criteria.
	Electric poster assembly	Children will: mount the final design to make it stiffer and stronger, build a simple circuit that includes a bulb, test and evaluate my electric display board, name and identify simple circuit components (bulb, battery and wires).
	Enhancements Visit to Arbeia for first-hand experience of information design. History unit – Roman Britain. Science unit – electricity	

Spring	Pavilions (Structures)	
Character Culture Creativity Challenge	Prior Learning In year 3 pupils learned that wide, flat based structures are more stable and they developed their understanding that 3D shapes are made up of 2D shapes nets. They increased their cutting and joining skills and learned about scoring lines in nets to create 3D shapes.	
	Key Learning Intentions (Skills) Design: To design a stable structure that is aesthetically pleasing and select materials to create a desired effect. Make: To build free standing frame structures designed to support weight. To select appropriate materials to build a strong structure. To create a design in accordance with a plan. Evaluate: To give and accept constructive criticism. To test the success of initial ideas and justify opinions. To revisit the requirements of the design brief to review design ideas.	
	Key Learning Intentions (Knowledge) To know... • What a frame structure is • That a ‘free-standing’ structure is one that stands on its own • A pavilion is a decorative building or structure for leisure activities • That cladding can be applied to structures for different effects • Aesthetics are how a product looks	Key Vocabulary 3D shapes cladding design criteria innovative natural reinforce structure
	Overview of outcomes Children will produce a range of free-standing frame structures of different shapes and sizes. They will design a pavilion that is strong, stable and aesthetically pleasing. They will be able to select appropriate materials and construction techniques to create a stable, free-standing frame structure and then select appropriate materials and techniques to add cladding to their pavilion.	



Milestones of Learning		
	To create a range of different shaped frame structures.	Children will: make a variety of different frame structures and know what a pavilion is used for.
	To design a structure	Children will: understand that different materials can create different effects, know how to make a stable structure and design a structure that is stable and aesthetically pleasing.
	To build a frame structure.	Children will: build a free standing structure, select appropriate materials to build a strong structure, reinforce corners to strengthen structures and use their design sheet to create their pavilion.
	To add cladding to a frame structure	Children will: select appropriate materials for the cladding, add cladding which reflects the design and create different textural effects with that material.
	Enhancements History unit: Ancient Greece (buildings) Art: Architecture	

Summer	Pneumatic Toys (Mechanical)	
Character Culture Creativity Challenge	Prior Learning In key stage 1, pupils have made slider mechanisms that have a slider, slots and guides to allow objects to move up and down or side to side. They are also familiar with the mechanisms of wheels and axels.	
	Key Learning Intentions (Skills) Design: To design a toy that uses a pneumatic system. To develop design criteria from a design brief. To generate ideas using thumbnail sketches and exploded diagrams. Make: To create a pneumatic system to created a desired motion. To build a secure housing for a pneumatic system. To use syringes and balloons to create different types of pneumatic systems. Evaluate: To use the views of others to improve designs. To test and modify the outcome, suggesting improvements.	
	Key Learning Intentions (Knowledge) To know... - How a pneumatic system works - That pneumatic systems can be used as part of a mechanism - That pneumatic systems operate by drawing in, releasing and compressing air.	Key Vocabulary mechanism lever component thumbnail sketch pivot linkage system pneumatic system input output research adapt properties reinforce motion
	Overview of outcomes Children will draw accurate diagrams with correct labels, arrows and explanations and identify definitions for key terms. They will communicate two ideas using thumbnail sketches and then develop one idea using an exploded diagram. They will select appropriate equipment and materials to build a working pneumatic system and	



	assemble their pneumatic system within the housing to create the desired motion. They will create a finished pneumatic toy that fulfils the design brief.		
	Milestones of Learning		
	To know how a pneumatic system works	Children will: know that pneumatic systems are part of a mechanism, used in a range of everyday objects and can force air over a distance to create movement.	
	To design a toy that uses a pneumatic system	Children will: develop design criteria from a design brief, generate ideas using thumbnail sketches and exploded diagrams, design a toy and use recycled household objects to make it.	
	To build make a pneumatic system	Children will: create a pneumatic system to create the desired motion and build secure housing for the system.	
	To add test and finalise ideas against a design criteria	Children will: know that materials are selected for their functional and aesthetic characteristics and recall how to manipulate materials to create different effects by cutting, creasing, folding and weaving.	
	Enhancements		
N/A			