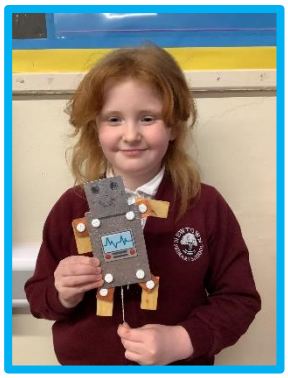
Design and Technology at Newtown Community Primary School

Excellence in Learning for Excellence in Life












Intent: What we want for children at Newtown

We want children to experience a design technology curriculum that inspires them, challenges them and makes them think creatively. Design and technology at Newtown is progressive and structured through key milestones and end points. It provides children with a multitude of opportunities to design and make a variety of products that solve real world problems, enabling them to consider carefully how design is influenced by others' needs, wants and values. It is organised to develop an explicit understanding that design is a process and that each stage of the design process matters and is influential on final products. Children experience design and technology in a range of different contexts including nutrition and learning how to cook, which allow them to transfer their understanding of enduring design and technology principles across different contexts.

The Newtown Curriculum enables children to develop Design Technology subject knowledge, understanding and skills though an explicit approach to the learning process.

At all ages children develop their ability to:

- Ask relevant questions about what they are learning,
- Find out information that will help them answer their questions,
- Make sense of the information that they find out,
- Use and apply the information they have found within Design Technology but also within the broader curriculum.

Thinking Like a Designer

Implementation: How we deliver the Design and Technology Curriculum, and what it looks like in practice

Curriculum planning	The national curriculum and EYFS is the starting point for the design technology curriculum. Our translation of these starting points is through a progressively sequenced curriculum that builds towards explicit, age-appropriate yearly end points. Each unit sequence of design and technology learning is planned to build coherently across a series of sessions, where children learn the component knowledge, skills and understanding necessary to build towards composite outcomes.
For example:	*In Year 6 children build component knowledge of pneumatic systems, which they use to create a composite outcome of a lifting platform building on prior learning about levers and pivots.* *In Year 4 they use a Lego coding app to understand how and why different coding components are used. They then use this knowledge through a composite outcome to build a vehicle that uses code to navigate safely an obstacle course.*
Build on prior learning, embedding most useful content	'Golden Threads'; the most useful content within design and technology has been identified and the curriculum is structured to enable regular revisiting of this content throughout the curriculum progression and within other subject areas.
For example:	*Children revisit levers, linkages and pivots through projects on building a Dutch parallel motion bridge in Year 2, a wooden puppet with moving parts in Year 4 and a pneumatic lifting platform in Year 6.*
Relevant contexts for learning	Contexts for design and technology learning are identified and planned for as they are purposeful, relevant and engaging for children.
For example:	*Children build bridges in Year 2 when they study Isambard Kingdom Brunel. They build longboats in Year 5 when they study Vikings. They build moving toys in Year 1 when they study Victorians.*
Teaching	Children learn how to use the design process to investigate, plan, make and evaluate products. Design technology at Newtown is a practical subject and children learn how to use tools and resources safely from reception year onwards. All design and technology sequences of learning work towards a 'real' final product being created. Children also incorporate maths, science and computing understanding within their design technology learning.
For example:	*In Year 2 when building bridges, the children research well known bridges, they then test different structures and identify what makes a strong bridge. They then build a Dutch bridge that uses principles that they have learned about in their research and testing.*
Vocabulary and language use	Children learn relevant vocabulary because it is explicitly included within the sequenced curriculum end points, unit learning sequences and through knowledge organisers used to deepen children's disciplinary knowledge.
For example:	*In Year 1 the children design and build a wooded care. They learn the definitions for and use vocabulary such as: mechanism, vehicle, chassis, wheel, axle, movement, rotate.*
Assessment	Authentic assessment is used to enable, both children and teachers to understand success. In all year groups a blend of product self-assessment criteria and low stakes quizzes are used.
For example:	*In Year 5 when building their boats children assess how well they have used measurement skills learned in Maths to support them with their design drawing and tool use. They will also assess the quality of manufacture by evaluating the quality of joins and how much this contributed to the success of their products.*
Reading culture	Where possible teachers capitalise on opportunities to embed reading as a technical skill and for enjoyment within the design and technology curriculum.
For example:	*In Year 4 children read the 'Iron Man' by Ted Hughes, alongside designing and making a moving wooden puppet that uses linkages and levers.* *In Year 1 children reinforce and apply phonics knowledge by reading and understanding instructions during design technology lessons.*

Design Technology

Think and work like a designer – the design process (Disciplinary Knowledge)

Asking questions	Finding things out	Making sense of what you found out	Using what you found out
Disassemble Disassembly, research and analysis of existing products Know the function of the design. Know what makes a design successful. Use secondary sources to gather evidence of different types of design. Compare different designs that have the same function. Establish a design brief for a new design. Research a designer/s and legacy and impact.	**Develop** Respond to a design brief. Investigate different design concepts. Identify, test and record different design ideas. Understand and evaluate different techniques for construction a design idea. Develop final product design.	**Make and evaluate** Accurate and safe tool use Select and use materials according to function and aesthetics. Evaluate own designs against the brief. Evaluate structure, purpose, mechanisms and materials Use different techniques. Build bridges incorporating manipulated materials, a mechanism and appropriately secure joining. Compare their bridges to those looked at in research. Are any structural, purpose, mechanical or material characteristics shared? Evaluate finished product against the design brief.	**Apply** **Retrieval opportunity** Retrieving and applying learning on structure, purpose, mechanisms, and materials in the /Puppet/Boat/Pneumatics projects. Retrieving and applying learning on structure and materials in shelter building. Retrieving and applying learning on materials in science. States of matter, properties, and changes of materials.

Design Technology: Most useful content

	Essential knowledge, understanding and skills. (substantive Knowledge)	This means children will know and understand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Children will know, understand and explain that:	**Materials and purpose**	Materials are selected and used because they have functional properties.	Materials are used to create different objects. Some materials are soft and some are hard. Children explore different materials freely, in order to develop their ideas about how to use them and what to make.	**Wooden Toy Car** Square section wood has intrinsic stiffness. It can be finished e.g. sanded.	**Bridges** Card and paper can be manipulated to change its properties. It can be painted	**Cam Toy** Wood is a rigid material that can be shaped and is suitable to be used in some mechanisms.	**Robot Puppet** Wood is a rigid material that can be shaped and is suitable to be used in some mechanisms.	**Paddle Boat** Card can be waterproofed. Elastic bands can convert energy.	**Pneumatics** Air can be compressed, change shape and flow. Flat materials can have tensile and compressive strength.
					Shelters Some materials provide better protection than others.		**Shelters** Some materials provide better protection than others.		**Shelters** Some materials provide better protection than others.
	Materials and Structures	To create strong, stiff and stable structures we can: • fasten, fold, roll, shape and treat materials, • combine different materials.	**Joining materials** Materials can be joined together in different way. Cardboard can be joined using glue and tape. **Threading and textiles** Fabric can be sewn together using a needle and thread.	**Wooden Toy Car** Some materials naturally make strong structures. Triangles can be used to strengthen and stiffen a frame. (Jinx frame)	**Bridges** Sheet materials can be made stronger and stiffer by folding and rolling to create spans, beams and trusses. Fasteners improve the strength and	**Cam Toy** Some materials have intrinsic structural strength. 3D frames can be strengthened and made stable by using faces. (sides/diaphragm)		**Paddle Boat** A flexible material can be shaped to stiffen and strengthen a structure. Trusses can be used to strengthen flexible materials.	

					stability of a structure.					
					Shelters		**Shelters**		**Shelters**
	Mechanisms, mechanical systems and components	A mechanism enables a function to happen. Generally, there is an input and output with a mechanism.	Children explore items that have mechanisms during their play. They use words like: roll, move, axle, join,	**Wooden Toy Car**	**Bridges**	**Cam Toy**	**Robot Puppet**	**Paddle Boat**	**Pneumatics**
				Rolling: An axle and wheels can be used to allow a vehicle to roll smoothly.	Lifting: A winch and hinge can be used to create a moving mechanism that raises a span.	Rotating and rising: A cam mechanism can be used to change and combine the direction of movements.	Linkages: A series of linkages can enable several movements to happen simultaneously.	Propulsion: A material's properties can be used to store energy and create movement.	Pneumatic systems: Levers, linkages and pneumatics create coordinated and controlled movement.
						Rover - Lego We Do		**Climate - Lego We Do**	
						Rotational movement can be transferred using a pulley.		Gears and linkages can be combined to create a range of different movements.	
	Electrical systems and components	To understand that electrical systems and components can be incorporated into the function of a design.	Children explore items that have electrical systems and components during their play. They use words like: light, move, electric, sound, noise.			**Rover - Lego We Do**	**Science Link**	**Climate - Lego We Do**	**Science Link**
						Programming can control an electrical system.	Science Link Design a game that uses a variety of components	Programming can control an electrical system.	Science Link Design a switching system/b
	Computing systems and components	Using computing to program, monitor and control a product.	Bee bots: Using programming to control the movement and responses of mechanisms.			**Rover - Lego We Do**		**Climate - Lego We Do**	
						Computing: Using programming to control the movement and responses of mechanisms.		Computing: Using programming to control the movement and responses of mechanisms.	
	Design and Technology has shaped the world.	Some designs have dramatically changed how we live.		**Wooden Toy Car**	**Bridge**	**Cam Toy**	**Robot Puppet**	**Paddle Boat**	**Pneumatics**
				Henry Ford	Isambard Kingdom Brunel	Combustion engine.	Automation of processes once done by people.	How and why construction materials have changed through history.	Robotics and AI are changing our lives right here, right now.
	Cooking and nutrition	Three times each year all children take part in the 'Foodies' programme, where they: • Understand and apply the principles of a healthy and varied diet, • Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques, • Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed.							
	Equality	Not all groups of people are as fairly represented in the design industry.	Children learn about different designers both historical and contemporary who are diverse groups of people.						