Design and Technology at Boundary Primary School

“Design and Technology should be the subject where mathematical brainboxes and science whizzkids turn their bright ideas into useful products”

- James Dyson

What is Design and Technology?

“Design and Technology is an inspiring, rigorous and practical subject. Using creative 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.”

-National Curriculum

What is the aim of Design and Technology?

1. Master practical skills; develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
2. Design, make, evaluate and improve
3. Take inspiration from design throughout history

Intent

To encourage children to learn to think and work creatively to solve problems; both as individuals and collaboratively as members of a team. At Boundary, we encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. Where possible, we encourage children to make connections to other subjects, such as Mathematics, Science, Computing and Art. The children are also given opportunities to reflect upon and evaluate past and present technology and its usefulness.

Implementation

Through a variety of creative and practical activities, we teach the knowledge, understanding and skills needed to engage in the process of designing and making. Using a clear learning journey, children are able to show a clear process of research, design, make, improve and evaluate. At Boundary, we deliver a range of Design and Technology projects with a clear structure, which includes challenging students at all levels. Children are able to explore a range of existing products and formulate opinions on these, in order to make design decisions for their own products.

Impact

1. Children will become more resourceful, creative and capable citizens.
2. Through the evaluation of past and present Design and Technology, they will develop an understanding of its impact on the world.
3. Build and apply a range of knowledge, understanding and skills in order to design and make high-quality products and for a range of users and evaluate and test their ideas and products.
4. Children learn to take risks and produce high-quality products.

Design and Technology Curriculum Overview:
Revised March 2021

	Autumn 1	*Autumn 2*	*Spring 1*	*Spring 2*	*Summer 1* All year groups Nursery to Year 6 will take part in a D&T food day!	*Summer 2*
Year 1	**Food** – one day		**Mechanisms** Slides and Levers			**Structures** Freestanding structures
Year 2	**Mechanisms** Wheels and axles			**Textiles** Templates and joining techniques		
Year 3					**Construction** Shell structures	**Textiles** 2D shape to 3D shape product
Year 4		**Electrical Systems** Simple circuits and switches (including programming and control) **Food –**one day			**Mechanical Systems** Levers and linkages	
Year 5			**Construction** Frame structures		**Electrical Systems** More complex switches and circuits (including programming and control)	
Year 6						**Textiles** Using CAD **Mechanical Systems** Pulleys or gears

Progression of skills

Children's skills progress on a two-year cycle. In the first year of the cycle, for example in Year 1 they learn brand new skills. Then in the second year of the cycle, for example in Year 2, they develop and master these skills.

Progression of skills in Design and Technology							
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Master practical skills	*Food*	• Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients.		• Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).		• Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures.	
	Materials	• Cut materials safely using tools provided. • Measure and mark out to the nearest centimetre. • Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). • Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).		• Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). • Select appropriate joining techniques.		• Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).	
	Textiles	• Shape textiles using templates. Join textiles using running stitch. • Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).		• Understand the need for a seam allowance. • Join textiles with appropriate stitching. • Select the most appropriate techniques to decorate textiles.		• Create objects (such as a cushion) that employ a seam allowance. • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration). • Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion).	

	Electricals and electronics	• Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).	• Create series and parallel circuits	• Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).
	Computing	• Model designs using software.	• Control and monitor models using software designed for this purpose.	• Write code to control and monitor models or products.
	Construction	• Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.	• Choose suitable techniques to construct products or to repair items. • Strengthen materials using suitable techniques.	• Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).
	Mechanics	• Create products using levers, wheels and winding mechanisms.	• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	• Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs.
Design, make, evaluate and improve		• Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Use software to design.	• Design with purpose by identifying opportunities to design. • Make products by working efficiently (such as by carefully selecting materials). • Refine work and techniques as work progresses, continually evaluating the product design. • Use software to design and represent product designs.	• Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.
Take inspiration from design throughout history		• Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created.	• Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work.	• Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. • Create innovative designs that improve upon existing products. • Evaluate the design of products so as to suggest improvements to the user experience.

Assessment

Teachers assess progress by making observations during lessons and discussions, marking books and evaluating end products. Teachers also make progress judgments against learning objectives (progression of skills) and success criteria (given to the children on their LOs).

At the end of a unit, children review their own and each other's work, focusing on an evaluation of the finished product and how effectively it meets the learning objective and agreed design criteria.

What does Design and Technology look like in EYFS?

There are many opportunities for carrying out Design and Technology related activities in all areas of learning in EYFS.

By the end of the EYFS, most children should be able to:

- Construct with a purpose in mind, using a variety of resources.
- Use simple tools and techniques competently and appropriately.
- Build and construct with a wide range of objects, selecting appropriate resources and adapting their work when necessary.
- Select the tools and techniques they need to shape, assemble and join materials they are using.