

Beaufront First School Long-Term Plan: Design Technology

Intent	Implementation	Impact
The Design Technology Curriculum at Beaufront meets the requirements of the National Curriculum, is informed by planning from Kapow, and is enriched by teacher-knowledge, by following children's interests, with whole-school termly 'Take One Picture' weeks and with STEM weeks throughout the year. This curriculum ensures that children can: • Design and make products in creative and imaginative ways. • Design and make products that solve real and relevant problems. • Acquire and apply broadening subject knowledge and draw on other knowledge and skills from across the curriculum to design, make, and evaluate products. • Evaluate past and present design technology to critically understand the impact of design technology on daily life and in the wider context. • Understand and apply the principles of nutrition, and learn how to cook. Children will develop their skills through processes of: • Design • Make • Evaluate • Technical Knowledge They will develop their knowledge and skills through the strands of: • Cooking and Nutrition • Mechanisms/ Mechanical Systems • Structures	All children will engage in weekly Design Technology lessons for 3 half-terms per year, which will be supplemented and complemented by the Art Curriculum, focused 'Take One Picture' weeks once per term, STEM weeks, and cross-curricular themed weeks and days. Our inclusive and enriched curriculum enables all children to experience and engage with Design Technology through: • Carefully planned sequences of lessons including theoretical and practical learning opportunities, designed to develop the knowledge, understanding and skills needed to design and make their own products through a process of design, make and evaluate. • Carefully planned, varied and appropriate resources and enriched learning experiences, which will include visits to places of significance in the world of design technology, visits from designers and creators, access to a range of resources for exploration and use, and exposure to existing creations and products for evaluation. Children's progress in Design Technology will centre around the interplay between practical, theoretical, and disciplinary knowledge and is closely related to Art as well as to other subjects such as Mathematics, Science, and Computing. Children will also build skills in relation to: - Listening - Speaking	Through a focused, inspiring, and enriched Design Technology Curriculum, children can: • Explore and use a wide range of materials with which it design and make for different purposes. • Explore and use a widening range of tools to design and make products. • Develop creative, technical, and practical skills at a high level to participate fully in everyday tasks, including those of a technological nature. • Build and apply broadening knowledge, understanding, and skills to design and make high-quality prototypes and products for a wide range of users and uses. • Test the prototypes and products (their own and those of others) and critically evaluate them to identify how they work or could be improved. • Learn to cook and understand nutrition and cooking processes. • Know about famous inventors and their inventions and creations, and how they impact daily life. • Recognise the different needs for, and uses of, design technology in our ever-changing world.

• Textiles • Electrical Systems • Digital World Through a rich, challenging and engaging Design Technology Curriculum closely linked to the Art Curriculum, children will therefore build: a) Substantive knowledge - Practical: Methods and techniques; Media and materials; Formal elements: Line, tone, shape, colour, form, pattern, texture - and Theoretical: Knowledge of artists; Interpreting works of art; Materials and processes. b) Disciplinary knowledge - What?; Why?; How? This will enable all pupils to be engaged, inspired, and challenged. All pupils will enjoy high-quality creative learning and exploration opportunities, enabling them to experiment, to be inventive and innovative, and to design and make their own products, exploring existing products and following design briefs to create their own products. Pupils will also develop their critical thinking skills to be able to analyse and evaluate products, and to consider the significance and impact of design and technology now and in the past.	- Problem Solving - Creativity - Planning - Adapting - Leadership - Teamwork	
Design Technology Curriculum Objectives		
EYFS (Nursery & Reception)	KS1 (Year 1 & 2)	KS2 (Year 3 & 4)
ELGs <i>Communication and Language</i> • Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.	National Curriculum <i>Design</i> • Design purposeful, functional, appealing products for themselves and other users based on design criteria.	National Curriculum <i>Design</i> • Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose,

- Express their ideas and feelings about their experiences using full sentences, including use of past, present, and future tenses, and making use of conjunctions, with modelling and support from their teacher. <i>Personal, Social and Emotional</i> - Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions. - Be confident to try new activities and show independence, resilience, and perseverance in the face of challenge. <i>Physical Development</i> - Use a range of small tools, including scissors, paint brushes, and cutlery. - Begin to show accuracy and care when drawing. - Manage their own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices. <i>Understanding the World</i> - Know some similarities and differences between things in the past and now, drawing on their experiences and what has been read in class. - Understand the past through settings, characters, and events encountered in books read in class and storytelling. - Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts, and – when	- Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. <i>Make</i> - Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. - Select from and use a wide range of materials and components, including construction materials, textiles, and ingredients, according to their characteristics. <i>Evaluate</i> - Explore and evaluate a range of existing products evaluate their ideas and products against design criteria. <i>Technical Knowledge</i> - Build structures, exploring how they can be made stronger, stiffer, and more stable. - Explore and use mechanisms [for example, levers, sliders, wheels, and axles] in their products. Specific Objectives <i>Structures (Technical)</i> - Understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses)→ Know that shapes and structures with wide, flat bases or legs are the most stable → Understand that the shape of a structure affects its strength. - Understand that axles are used in structures and mechanisms to make parts turn in a	aimed at particular individuals or groups. - Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces, and computer-aided design. <i>Make</i> - Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. - Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities <i>Evaluate</i> - Investigate and analyse a range of existing products, evaluate their ideas and products against their own design criteria, and consider the views of others to improve their work. - Understand how key events and individuals in design and technology have helped shape the world. <i>Technical knowledge</i> - Apply their understanding of how to strengthen, stiffen, and reinforce more complex structures. - Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers, and linkages]. - Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and
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appropriate – maps. ● Explore the natural world around them, making observations and drawing pictures of animals and plants. ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. <i>Expressive Arts and Design</i> ● Safely use and explore a variety of materials, tools, and techniques, experimenting with colour, design, texture, form, and function. ● Share their creations, explaining the process they have used. ● Make use of props and materials when role-playing characters in narratives and stories. Specific Objectives <i>Structures (Technical)</i> ● Know that there are a range to different materials that can be used to make a model and that they are all slightly different. ● Make simple suggestions to fix their junk model. ● Know that ‘waterproof’ materials are those which do not absorb water. ● Know that some objects float and others sink. ● Know and name the different parts of a boat. <i>Cooking and Nutrition</i> ● Know that soup is ingredients (usually vegetables and liquid) blended together. ● Know that vegetables are grown. ● Recognise and name some common vegetables.	circle. ● Begin to understand that different structures are used for different purposes. ● Know that a structure is something that has been made and put together. ● Know that the sails or blades of a windmill are moved by the wind. ● Know that a structure is something built for a reason → Know that a structure is something that has been formed or made from parts. ● Know that stable structures do not topple. ● Know that adding weight to the base of a structure can make it more stable → Know that a ‘stable’ structure is one that is firmly fixed and unlikely to change or move. ● Know that materials can be manipulated to improve strength and stiffness → Know that a ‘stiff’ structure or material is one that does not bend easily. ● Know that a ‘strong’ structure is one that does not break easily. ● Know that design criteria is a list of points to ensure the product meets the client’s needs and wants. ● Know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. ● Know that windmill turbines use wind to turn and make the machines inside work. ● Know that a windmill is a structure with sails that are moved by the wind. ● Know the three main parts of a windmill are the turbine, axle, and structure. ● Know that windmills are used to generate power and were used for grinding flour.	motors]. ● Apply their understanding of computing to program, monitor, and control their products. Specific Objectives <i>Structures (Technical)</i> ● Understand that wide and flat based objects are more stable. ● Understand the importance of strength and stiffness in structures. ● Understand what a frame structure is. ● Know that a ‘free-standing’ structure is one that can stand on its own. ● Know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge, and gatehouse - and their purpose. ● Know that a façade is the front of a structure. ● Understand that a castle needed to be strong and stable to withstand enemy attack. ● Know that a paper net is a flat 2D shape that can become a 3D shape once assembled. ● Know that a design specification is a list of success criteria for a product. ● Know that a pavilion is a decorative building or structure for leisure activities. ● Know that cladding can be applied to structures for different effects. ● Know that aesthetics are how a product looks. ● Know that a product’s function means its purpose. ● Understand that the target audience means the person or group of people a product is designed for.
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• Know that different vegetables taste different. • Know that eating vegetables is good for us. • Be able to discuss why different packages might be used for different foods. <i>Textiles</i> • Know and understand that a design is a way of planning our idea before we start. • Know that threading is putting one material through an object. •	• Know that natural structures are those found in nature. • Know that man-made structures are those made by people. <i>Mechanisms/ Mechanical Systems (Technical)</i> • Know that a mechanism is the parts of an object that move together → Know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • Know that a slider mechanism moves an object from side to side. • Know that a slider mechanism has a slider, slots, guides, and an object. • Know that bridges and guides are bits of card that purposefully restrict the movement of the slider. • Know that in Design and Technology we call a plan a 'design'. • Know that wheels need to be round to rotate and move. • Understand that for a wheel to move, it must be attached to a rotating axle. • Know that an axle moves within an axle holder, which is fixed to the vehicle or toy → Know the features of a ferris wheel include the wheel, frame, pods, a base, and an axle holder. • Know that the frame of a vehicle (chassis) needs to be balanced. • Know that different materials have different properties and are therefore suitable for different uses. • Know that it is important to test my design as I go along so that I can solve any problems	• Know that architects consider light, shadow, and patterns when designing. <i>Mechanisms/ Mechanical Systems</i> • Understand how pneumatic systems work. • Understand that pneumatic systems can be used as part of a mechanism. • Know that pneumatic systems operate by drawing in, releasing, and compressing air. • Understand that all moving things have kinetic energy. • Understand that kinetic energy is the energy that something (object/person) has by being in motion. • Know that air resistance is the level of drag on an object as it is forced through the air. • Understand that the shape of a moving object will affect how it moves due to air resistance. • Understand how sketches, drawings, and diagrams can be used to communicate design ideas. • Know that exploded-diagrams are used to show how different parts of a product fit together. • Know that thumbnail sketches are small drawings to get ideas down on paper quickly. • Understand that products change and evolve over time. • Know that aesthetics means how an object or product looks in design and technology. • Know that a template is a stencil you can use to help you draw the same shape accurately. • Know that a birds-eye view means a view from a high angle (as if a bird in flight). • Know that graphics are images, which are
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	that may occur. ● Know that there is always an input and output in a mechanism. ● Know that an input is the energy that is used to start something working. ● Know that an output is the movement that happens as a result of the input. ● Know that a lever is something that turns on a pivot. ● Know that a linkage mechanism is made up of a series of levers. ● Know some real-life objects that contain mechanisms. <i>Cooking and Nutrition</i> ● Know that a blender is a machine, which mixes ingredients together into a smooth liquid. ● Know that a fruit has seeds. ● Know that fruits grow on trees or vines. ● Know that vegetables can grow either above or below ground. ● Know that vegetables is any edible part of a plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). ● Know that 'diet' means the food and drink that a person or animal usually eats. ● Understand what makes a balanced diet. ● Know that the five main food groups are: ● Carbohydrates, fruits and vegetables, protein, dairy, and foods high in fat and sugar. ● Understand that I should eat a range of different foods from each food group, and roughly how much of each food group. ● Know that 'ingredients' means the items in a mixture or recipe.	designed to explain or advertise something. ● Know that it is important to assess and evaluate design ideas and models against a list of design criteria. <i>Electrical Systems (Technical)</i> ● Understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. ● Understand common features of an electric product (switch, battery or plug, dials, buttons etc.). ● List examples of common electric products (kettle, remote control etc.). ● Understand that an electric product uses an electrical system to work (function). ● Know the name and appearance of a bulb, battery, battery holder, and crocodile wire to build simple circuits. ● Understand that electrical conductors are materials, which electricity can pass through. ● Understand that electrical insulators are materials, which electricity cannot pass through. ● Know that a battery contains stored electricity that can be used to power products. ● Know that an electrical circuit must be complete for electricity to flow. ● Know that a switch can be used to complete and break an electrical circuit. ● Understand the importance and purpose of information design. ● Understand how material choices (such as mounting paper to corrugate card) can
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	<i>Textiles</i> ● Know that 'joining technique' means connecting two pieces of material together → Know that sewing is a method of joining fabric. ● Know that there are various temporary methods of joining fabric by using staples, glue or pins. ● Understand that different techniques for joining materials can be used for different purposes. ● Understand that a template (or fabric pattern) is used to cut out the same shape multiple times. ● Know that drawing a design idea is useful to see how an idea will look. ● Know that different stitches can be used when sewing. ● Understand the importance of tying a knot after sewing the final stitch. ● Know that a thimble can be used to protect my fingers when sewing.	improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached). ● Know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. ● Know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. <i>Cooking and Nutrition</i> ● Know that not all fruits and vegetables can be grown in the UK. ● Know that climate affects food growth. ● Know that vegetables, and fruit grow in certain seasons. ● Know that cooking instructions are known as a 'recipe'. ● Know that imported food is food, which has been brought into the country. ● Know that exported food is food, which has been sent to another country.. ● Know that eating seasonal foods can have a positive impact on the environment. ● Know that similar coloured fruits and vegetables often have similar nutritional benefits. ● Know that the appearance of food is as important as taste. ● Know that the amount of an ingredient in a recipe is known as the 'quantity'. ● Know that safety and hygiene are important when cooking. ● Know the following cooking techniques: sieving, measuring, stirring, cutting out, and shaping. ● Understand the importance of budgeting
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		while planning ingredients for biscuits. ● Know that products often have a target audience. <i>Textiles</i> ● Know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. ● Know that when two edges of fabric have been joined together it is called a seam → Know that a fastening is something which holds two pieces of material together, for example, a zipper, toggle, button, press stud, and velcro. ● Know that it is important to leave space on the fabric for the seam. ● Understand that some products are turned inside out after sewing so that the stitching is hidden. ● Know that different fastening types are useful for different purposes. ● Know that creating a mock-up (prototype) of their design is useful for checking ideas and proportions. <i>Digital World (Technical)</i> ● Understand that, in programming, a 'loop' is code that repeats something again and again until stopped. ● Know that a Microbit is a pocket-sized, codeable computer. ● Know that a simulator is able to replicate the functions of an existing piece of technology. ● Understand what variables are in programming. ● Know some of the features of a Microbit. ● Know that an algorithm is a set of
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		instructions to be followed by the computer. • Know that it is important to check my code for errors (bugs). • Know that a simulator can be used as a way of checking your code works before installing it onto an electronic device. • Know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. • Understand what is meant by 'point of sale display.' • Know that CAD stands for 'Computer-aided design'. • Know what a focus group is by taking part in one. • Understand the terms 'ergonomic' and 'aesthetic'. • Know that a prototype is a 3D model made out of cheap materials that allows us to test design ideas and make better decisions about size, shape, and materials. • Know that an exhibition is a way for companies to showcase products, meet potential new customers, and gather feedback from users.
Big Questions		
Why is Design Technology important? What makes a good designer/ what are the characteristics of a good designer? What is the impact on the environment? How can this be improved? Why do we need to reduce, reuse and recycle? How does this impact the processes in Design Technology? What is the impact if we do not think environmentally? How does it affect/ improve quality of life?		

Programme of Study - Overview			
	EYFS	KS1	KS2
Autumn 1A			
Autumn 2A	Textiles: Bookmarks	Textiles: Puppets	(Painting and Mixed Media: Prehistoric Art) Mechanical Systems: Making a Slingshot Car
Spring 1A			
Spring 2A	Structures: Junk Modelling	Structures: Constructing a Windmill	Nutrition and Cooking: Eating Seasonally
Summer 1A			
Summer 2A	Textiles: Camouflage	Mechanisms: Making a Moving Monster	Electrical Systems: Torches
Autumn 1B	Structures: Junk Modelling	Structures: Baby Bear's Chair	Structures: Constructing a Castle
Autumn 2B			
Spring 1B	Cooking and Nutrition: Soup	Mechanisms: Fairground Wheel	Structure: Pavillions
Spring 2B			
Summer 1B	Structures: Boats	Nutrition and Cooking: Smoothies	Digital World: Wearable Technology
Summer 2B			