

Long Term Plan for Design and Technology

		EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design	Skills		<p>NC Reference:</p> <ul style="list-style-type: none"> design purposeful, functional, appealing products for themselves and other users based on design criteria generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology 		<p>NC Reference:</p> <ul style="list-style-type: none"> use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, 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 			
		<p>Generate ideas based on simple design criteria and their own experiences, explaining what they could make.</p> <p>Work confidently within a range of contexts, such as imaginary, story-based, home and school.</p> <p>Describe what their products are for.</p> <p>Develop and communicate ideas by talking and drawing.</p> <p>State what products they are designing and making.</p>	<p>Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.</p> <p>Work confidently within a range of contexts, such as the home, school, leisure, culture</p> <p>Describe the purpose of their products</p> <p>Use annotated sketches, prototypes, final product sketches and pattern pieces; communication technology, to develop and communicate ideas.</p>	<p>Generate and clarify ideas through discussion with peers to develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups.</p> <p>Work confidently within a range of contexts, such as the culture, enterprise, industry and the wider environment</p> <p>Use annotated sketches and appropriate information and communication technology, to develop and communicate ideas.</p> <p>Generate, develop, model and communicate realistic ideas through discussion and, as</p>	<p>Generate innovative ideas through research including surveys, interviews and questionnaires and discussion with peers to develop a design brief and criteria for a design specification.</p> <p>identify the needs, wants, preferences and values of particular individuals and groups.</p> <p>Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.</p> <p>Develop and communicate ideas through discussion,</p>	<p>Research using surveys, interviews, questionnaires and web-based resources. to develop a design specification for a range of functional products.</p> <p>Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.</p> <p>Generate and develop innovative ideas and</p>		

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	<p>Say whether their products are for themselves or other users.</p>	<p>Say how they will make their products suitable for their intended users.</p> <p>Use simple design criteria to help develop their ideas.</p> <p>Use knowledge of existing products to help come up with ideas.</p> <p>Model ideas by exploring materials, components and construction kits and by making templates and mock-ups.</p> <p>Use information and communication technology, where appropriate, to develop and communicate their ideas.</p>	<p>Indicate the design features of their products that will appeal to intended users</p> <p>Explain how particular parts of their products work</p> <p>Gather information about the needs and wants of particular individuals and groups</p>	<p>appropriate, annotated sketches, cross-sectional and exploded diagrams.</p> <p>Develop their own design criteria and use these to inform their ideas</p>	<p>annotated drawings, exploded drawings and drawings from different views. and, where appropriate, computer-aided design</p>	<p>share and clarify these through discussion.</p> <p>Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams. (E.g. cross-section / cutaway)</p>

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NC Reference

- 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

NC Reference

- 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

Select and use simple utensils, tools and equipment to perform a job e.g. peel, cut, slice, squeeze, grate and chop safely; marking out, cutting, joining and finishing; cut, shape and join paper and card.

Select from a range of ingredients and materials according to their characteristics to create a chosen product.

Select and use tools, equipment, skills and techniques to perform practical tasks, explaining their choices.

Select new and materials, components, reclaimed materials and construction kits to build and create their products. Use simple finishing techniques, including those from art and design, suitable for the products they are creating.

Plan by suggesting what to do next.

Select from and use a range of appropriate utensils, tools and equipment with some accuracy related to their product.

Select from and use finishing techniques suitable for the product they are creating.

Plan the main stages of making.

Select and use appropriate tools to measure, mark out, cut, score, shape and combine with some accuracy related to their products.

Select and use materials and components, including ingredients, construction and electrical components according to their function and properties. Explain their choice of materials according to functional properties and aesthetic qualities.

Order the main stages of making.

Select from and use, a range of appropriate utensils, tools and equipment accurately to measure and combine appropriate ingredients, materials and resources.

Use finishing and decorative techniques, which are suitable for the product they are designing and making.

Produce detailed lists of equipment and fabrics relevant to their tasks

Write a step-by-step plan, including a list of resources required.

Competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials, and securely connect electrical components to produce reliable, functional products.

Use finishing and decorative techniques, with a number of steps, which are suitable for the product they are designing and making.

Demonstrate resourcefulness when tackling practical problems.

Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components

Making

Skills

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NC Reference

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

NC Reference

- 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

Taste, explore and evaluate a range of products to determine the intended user's preferences for the product.

Evaluate their ideas throughout and finished products against design criteria, including intended user and purpose

Explore a range of existing products related to their design criteria explaining:
 -what they are
 -Who they are for
 -How they work
 -How they are used
 -Where they would be used
 -What they are made of
 -What they like and dislike about them

Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.

Explain how their product could be improved.

Investigate a range of 3-D textile products, ingredients and lever and linkage products relevant to their project using the following questions:
 - How well have they been designed and made?
 - How well they work?
 - Who designed them?
 - When were they designed and made?

Test their product against the original design criteria and with the intended user.

Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.

Investigate and evaluate a range of products including the ingredients, materials, components and techniques that are used.

Test and evaluate their own products against design criteria and the intended user and purpose.

Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.

Investigate and analyse products linked to their final product using the following questions:
 - Why have materials been chosen?
 - What methods of construction have been used and why?
 - How well does the product achieve its purpose?
 - How well does the product meet the user needs and wants?

Compare the final product to the original design specification and record the evaluations.

Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.

Consider the views of others to improve their work.

Continually evaluate and modify the working features of the product to match the initial design specification. Evaluate:
 How much products cost to make
 How innovative products are
 How sustainable the materials in the products are
 What impact products have beyond their intended purpose

Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.

Test the system to demonstrate its effectiveness for the intended user and purpose.

Evaluating

Skills

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			<p>NC Reference:</p> <ul style="list-style-type: none"> • 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. 		<p>NC Reference:</p> <ul style="list-style-type: none"> • 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 motors] • apply their understanding of computing to program, monitor and control their products. 			
Structures	<i>Technical Knowledge</i>		<p>Know how to make freestanding structures stronger, stiffer and more stable.</p>	<p>Develop and use knowledge of how to construct strong, stiff shell structures.</p>	<p>Understand which parts of a structure may be weaker and design methods to overcome this.</p>	<p>Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.</p>	<p>Design a stable structure that is able to support weight.</p> <p>Understand how to strengthen, stiffen and reinforce 3-D frameworks.</p> <p>Learn about engineers, and designers who have developed ground-breaking products.</p>	<p>Create a frame structure with a focus on triangulation.</p> <p>Design a scenario featuring a variety of different structures, considering how the structures will be used, and what are effective and ineffective designs based on prior knowledge and experience.</p>

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Textiles

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	<p>Begin to identify different forms of textiles/fabric e.g. felt, velvet, cotton.</p> <p>Continue to develop understanding weaving techniques.</p> <p>Use different fabrics and materials in collages.</p>	<p>Understand how simple 3-D textile products are made, using a template to create two identical shapes.</p> <p>Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling.</p> <p>Measure and cut textiles accurately</p> <p>Join who pieces of material together.</p>	<p>Sew a simple running stitch, taking a needle up and down through fabric.</p> <p>Begin to thread a needle independently.</p> <p>Continue to use a running stitch and introduce an over stitch with greater accuracy.</p> <p>Apply decoration using beads, buttons, feathers etc.</p> <p>Begin to modify threads and fabrics, knotting, fraying, fringing, pulling threads, twisting, plaiting.</p>	<p>Thread a needle independently.</p> <p>Introduce a cross stitch.</p> <p>Apply decoration using needle and thread: buttons, sequins.</p> <p>Gain experience in applying colour by printing and using fabric crayons/ paints.</p> <p>Change and modify threads and fabrics with greater precision to create a desired effect.</p>	<p>Introduce a cross stitch in embroidery.</p> <p>Use a variety of techniques, e.g. printing, dyeing, weaving and stitching to create different textural effects.</p> <p>Demonstrate experience in combining techniques to produce an end piece.</p> <p>Show awareness of the skills involved in aspects such as knitting, lace making.</p> <p>Continue to change and modify threads and fabrics,</p>	<p>Produce a 3-D textile product from a combination of accurately made pattern pieces, fabric shapes and different fabrics.</p> <p>Understand how fabrics can be strengthened, stiffened and reinforced where appropriate.</p> <p>Design, plan and decorate a fabric piece.</p> <p>Use a number of different stitches creatively to produce different patterns and textures.</p> <p>Recognise different forms of textiles and express opinions on them.</p> <p>Learn about designers who have developed ground-breaking products.</p>

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Mechanisms/Mechanical Systems		<p>Explore and use sliders and levers.</p> <p>Understand that different mechanisms produce different types of movement.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Explore and use wheels, axles and axle holders.</p> <p>Distinguish between fixed and freely moving axles.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Accurately use wheels, axles and axle holders to create a moving vehicle.</p> <p>Know and use technical vocabulary relevant to the project.</p>	<p>Design and make a Roman catapult using levers. (The catapult needs to move so will need axels and wheels recapped from vehicles in Y3.)</p> <p>Understand and use lever and linkage mechanisms.</p> <p>Distinguish between fixed and loose pivots.</p> <p>Learn about inventors and manufacturers who have developed ground-breaking products.</p>	<p>Understand that mechanical and electrical systems have an input, process and an output.</p> <p>Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</p> <p>Know and use technical vocabulary relevant to the project.</p>	
Electrical Systems					<p>Understand and use electrical systems in their products linked to science coverage.</p> <p>Apply their understanding of computing to program and control their products.</p> <p>Know and use technical vocabulary relevant to the project.</p>		<p>Understand and use electrical systems in their products linked to science coverage.</p> <p>Apply their understanding of computing to program, monitor and control their products.</p> <p>Know and use technical vocabulary relevant to the project.</p>

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Cooking and Nutrition

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	<p>NC Reference:</p> <ul style="list-style-type: none"> use the basic principles of a healthy and varied diet to prepare dishes understand where food comes from. 		<p>NC Reference:</p> <ul style="list-style-type: none"> 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. 			
	<p>Understand that all food comes from plants or animals and can name where some foods come from in the UK.</p> <p>Describe the texture of foods</p>	<p>Sort food into groups depending on if it is farmed, grown elsewhere or caught</p> <p>Identify some fruits or vegetables from the countries that I am studying – Australia and the UK</p>	<p>Start to know that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world.</p> <p>Name some of the foods that are grown, reared or caught in the countries of study - Europe.</p> <p>Grow plants such as cress and herbs from seed with the intention of using them for their food product. <i>(egg and cress sandwiches)</i></p>	<p>Name some of the foods that are grown, reared or caught in the countries of study – North and South America</p>	<p>Understand how food is processed into ingredients that can be eaten or used in cooking.</p> <p>Name some of the foods that are grown, reared or caught in the countries of study (e.g. polar regions)</p> <p>Explain how seasons and weather/climate may affect the choice of foods available.</p>	<p>Understand that the seasons affect the foods that are available.</p> <p>Name some of the foods that are grown, reared or caught in the countries of study (Food from around the world as we focus on Natural Disasters.)</p> <p>Grow my own products with a view to preserving these, taking account of time required to grow different foods?)</p>
	<p>Recognise healthy and unhealthy foods.</p> <p>Know that everyone should eat at least five portions of fruit and vegetables every day.</p>	<p>Understand how to name and sort foods into the five groups in 'The Eat well plate'</p>		<p>Know that to be active and healthy, food and drink are needed to provide energy for the body.</p>	<p>Select appropriate foods for a high calorie diet.</p>	

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	<p>Know how to prepare simple dishes safely and hygienically, without using a heat source.</p> <p>Know what needs to happen to make us ready to prepare food (wash hands – clean apron – long hair tied back)</p>	<p>Know how to prepare yourself and your environment to prepare food (wash hands – clean apron – long hair tied back / clear and clean surfaces and tables)</p>	<p>Know how to prepare yourself and your environment to prepare food and what needs to happen to clear up afterwards?</p>	<p>Demonstrate my knowledge of safe and hygienic food preparation?</p> <p>Choose the right ingredients for a product.</p> <p>Select a healthy drink to accompany my product.</p> <p>Present my product in an interesting way</p>	<p>Demonstrate my knowledge of safe and hygienic food preparation?</p>	<p>Can I identify risks in order to ensure I am hygienic and safe?</p> <p>Can I explain how a product should be stored with reasons?</p> <p>Prepare a food item for storing (Link to WWII)</p> <p>Identify some of the ingredients within a dish and how they have been processed.</p>
	<p>Know how to cut food safely. (soft foods / claw grip / serrated knife)</p>	<p>Know how to cut, peel and grate safely. (hard foods / bridge hold / serrated knife)</p> <p>Mix, knead and shape bread</p> <p>Combine, measure and roll pastry mixture and cut into shape.</p>	<p>Describe how my combined ingredients come together (e.g. <i>mashing / mixing / spreading</i>)</p> <p>Make sure that my product looks attractive.</p>	<p>Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.</p> <p>Mix, knead and shape bread, cutting and spreading. <i>(eg grilled cheese sandwich / avocado on toast to link with Americas using homemade bread)</i></p>	<p>Appropriately identify how to prepare a selection of vegetables and use a range of techniques accurately to prepare these.</p> <p>Create hot meals using a hob and an oven safely.</p>	<p>Experiment with using a range of techniques to create aesthetically pleasing dishes.</p> <p>Know that recipes can be adapted to change the appearance, taste, texture and aroma.</p>
			<p>Learn about chefs who have developed ground-breaking products.</p>			