

Design and Technology Long Term Plan

AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
<b>YEAR 1</b>					
	<p><b><u>Mechanical Components</u></b></p> <ul style="list-style-type: none"> <li>✓ To talk about the purpose of a wheel.</li> <li>✓ To talk about their own experience of vehicles with wheels.</li> <li>✓ To talk about designs for vehicles to carry a toy.</li> <li>✓ To make a drawing of a design for a four-wheel vehicle to carry a toy.</li> <li>✓ To experiment with construction kits to make an object that moves.</li> <li>✓ To attach wheels to a chassis using an axle with cotton reels and dowels.</li> <li>✓ To attach wheels to a chassis using an axle with straws and paper wheels/ circles.</li> <li>✓ To suggest reasons why a wheel and axle wobbles based on hole position.</li> <li>✓ To talk about why their vehicle moves.</li> <li>✓ To say what is similar about their and another vehicle.</li> <li>✓ To recognise the different between fixed and freely moving axles. To understand what a wheel, chassis and axle is.</li> </ul>		<p><b><u>Food and Nutrition</u></b></p> <ul style="list-style-type: none"> <li>✓ To understand that food comes from plants and animals.</li> <li>✓ To sort fruits and vegetables based on colour, texture and taste.</li> <li>✓ To understand that everyone should eat at least five portions of fruit and vegetables every day.</li> <li>✓ To understand what a healthy meal is.</li> <li>✓ To understand that hands and utensils need to be washed before cooking.</li> <li>✓ To use a knife to cut fruit and vegetables into smaller pieces.</li> <li>✓ To understand how to hold fruit and vegetables so that they can be cut safely. To use a spoon to mix.</li> </ul>		
<b>YEAR 2</b>					
	<p><b><u>Construction</u></b></p> <ul style="list-style-type: none"> <li>✓ To talk about existing structures.</li> <li>✓ To use pictures and words to plan and design a free-standing structure linked to London.</li> <li>✓ To make and use templates.</li> <li>✓ To make simple mock-ups of structures.</li> <li>✓ To experiment with building free-standing structures using Polydron.</li> <li>✓ To use folding as a strengthening technique.</li> <li>✓ To use scissors to cut card and paper accurately.</li> <li>✓ To use a straight edge to mark lines for cutting.</li> <li>✓ To select suitable equipment to join materials (glue, tape, staples).</li> <li>✓ To layer materials as a finishing technique to make them more</li> </ul>		<p><b><u>Textiles</u></b></p> <ul style="list-style-type: none"> <li>✓ To talk about existing textile designs and print patterns.</li> <li>✓ To use pictures and words to plan and design a textile product.</li> <li>✓ To use IT to plan and design a textile product.</li> <li>✓ To make and use templates.</li> <li>✓ To use pins as a way of securing material and templates.</li> <li>✓ To use chalk to draw around a template.</li> <li>✓ To use scissors to cut templates and material accurately.</li> <li>✓ To use a straight edge to mark lines for cutting.</li> <li>✓ To select suitable equipment to join different parts of materials (glue, sewing, staples, pins).</li> <li>✓ To say what they like and dislike about joining with sewing, gluing and pinning based on comfort and aesthetic choices.</li> <li>✓ To evaluate different fabrics.</li> <li>✓ To sew using overstitch.</li> </ul>		

	<ul style="list-style-type: none"> <li>appealing for the intended user.</li> <li>✓ To learn about the designer Sir Christopher Wren and describe his work.</li> <li>✓ To learn about designers of influential London landmarks.</li> <li>✓ To say what they like and dislike about existing free-standing structures, referring to suitability of materials and stability.</li> <li>✓ To recognise the intended user of a free-standing structure.</li> <li>✓ To talk about what they have constructed and the techniques involved.</li> <li>✓ To describe what they like about their own and partners' structure.</li> <li>✓ To suggest one way the structure could have been changed by using a different construction material or joining technique.</li> <li>✓ To talk about different construction materials.</li> <li>✓ To describe how stable a structure is.</li> <li>✓ To understand how a free-standing structure can be made more stable, stiffer and stronger.</li> </ul>		<ul style="list-style-type: none"> <li>✓ To understand the purpose of a template.</li> <li>✓ To select a chosen fabric based on its properties.</li> <li>✓ To apply finishing techniques of stencil printing and gluing.</li> </ul> <p style="text-align: center;"><b><u>Food and Nutrition</u></b></p> <ul style="list-style-type: none"> <li>✓ To state foods that come from plants and animals.</li> <li>✓ To recognise foods relating to the Mexican culture.</li> <li>✓ To sort foods based on where they have come from (farmed, grown elsewhere or caught).</li> <li>✓ To suggest ways that at least five portions of fruit and vegetables can be eaten every day.</li> <li>✓ To understand what a varied and healthy diet is, using the Eatwell Guide.</li> <li>✓ To describe steps to take so that food is prepared hygienically.</li> <li>✓ To use a knife to peel fruit and vegetables and to discard pips/seeds.</li> <li>✓ To understand how to use a grater safely.</li> <li>✓ To use a spoon to measure quantities.</li> </ul>		
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**YEAR 3**

	<p style="text-align: center;"><b><u>Construction</u></b></p> <ul style="list-style-type: none"> <li>✓ To use research and previous learning to inform designs for a free-standing structure.</li> <li>✓ To use labelled sketches and instructions to plan a design for a functional free-standing structure linked to the Iron Age.</li> <li>✓ To test simple mock-ups of structure supports (including buttresses)</li> <li>✓ To build free-standing structures that are supported by a buttress.</li> <li>✓ To use scissors to score construction material.</li> <li>✓ To draw accurate cutting lines using a ruler.</li> <li>✓ To select suitable joining materials that provide hidden joins (glue, double-sided tape).</li> <li>✓ To compare designs and support structures of chairs created by Ludwig Mies Van Der Rohe.</li> </ul>	<p style="text-align: center;"><b><u>Electrical Components</u></b></p> <ul style="list-style-type: none"> <li>✓ To use research and historical knowledge to inform designs for a mining helmet circuit.</li> <li>✓ To use labelled sketches and instructions to plan a design for a mining helmet circuit.</li> <li>✓ To test different circuit components</li> <li>✓ To make different electrical systems.</li> <li>✓ To evaluate how some key designs of engineers in design and technology have helped shape the world.</li> <li>✓ To suggest ways mining helmets could change in the future.</li> <li>✓ To evaluate different designs of mining helmet and how they meet the intended design purpose.</li> <li>✓ To talk about ways their mining helmet functions electronically.</li> </ul>		<p style="text-align: center;"><b><u>Mechanical Components</u></b></p> <ul style="list-style-type: none"> <li>✓ To use research and historical knowledge to inform designs for a Shaduf.</li> <li>✓ To use labelled sketches and instructions to plan a design for a Shaduf.</li> <li>✓ To test different levers and pulleys for weight bearing.</li> <li>✓ To make levers and pulleys that can lift different loads from a surface.</li> <li>✓ To vary the position of the fulcrum to lift a load using a lever.</li> <li>✓ To strengthen structures using previous learning.</li> <li>✓ To compare Egyptian Shaduf designs with their own.</li> <li>✓ To contrast Egyptian Shadufs with modern designs that use pulleys and levers.</li> <li>✓ To evaluate how well their design lifts varying loads.</li> </ul>	<p style="text-align: center;"><b><u>Food and Nutrition</u></b></p> <ul style="list-style-type: none"> <li>✓ To understand that the Ancient Egyptians developed fermentation.</li> <li>✓ To state some foods that contain gluten and yeast.</li> <li>✓ To discuss about the way in which food processing can affect the taste, appearance, texture and colour of bread.</li> <li>✓ To understand the need for covering dough to maintain hygiene during benching and proofing.</li> <li>✓ To effectively disinfect surfaces.</li> <li>✓ To develop kneading techniques and understand why a floured surface is required.</li> <li>✓ To weigh dry ingredients using scales.</li> <li>✓ To use a measuring jug.</li> </ul>
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	<ul style="list-style-type: none"> <li>✓ To evaluate different ways of supporting a free-standing structure.</li> <li>✓ To evaluate how well a design is functional.</li> <li>✓ To talk about ways their free-standing structure is supported and can hold weight.</li> <li>✓ To suggest ways a structure could be altered whilst still meeting the intended user's needs.</li> <li>✓ To talk about the suitable properties of construction materials.</li> <li>✓ To explain what a buttress is.</li> </ul>	<ul style="list-style-type: none"> <li>✓ To suggest ways their mining helmet could be altered to improve efficiency.</li> <li>✓ To understand that electrical systems have an input, process and output.</li> <li>✓ To know that electrical circuits and components can be used to create functional products.</li> <li>✓ To understand what components a circuit requires.</li> <li>✓ To recognise designs that require electrical circuits to be functional.</li> <li>✓ To understand how to construct a circuit.</li> </ul>		<ul style="list-style-type: none"> <li>✓ To suggest ways their Shaduf could be altered to improve efficiency with the support of their peers.</li> <li>✓ To recognise the difference between a lever and a pulley.</li> <li>✓ To understand how to adapt a lever and a pulley based on load weight.</li> <li>✓ To understand how pulleys and levers create movement.</li> </ul>	
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**YEAR 4**

<p style="text-align: center;"><b><u>Construction</u></b></p> <ul style="list-style-type: none"> <li>✓ To use evaluation of previous construction to design a shell-structure.</li> <li>✓ To gather information about a user's wants and needs.</li> <li>✓ To use CAD (computer-aided design) to model and explain ideas.</li> <li>✓ To experiment with the construction of nets and domed shell-structures.</li> <li>✓ To understand that corrugating, laminating and ribbing can be used to strengthen shell-structures.</li> <li>✓ To use scissors to score joining flaps.</li> <li>✓ To use computer-aided finishing techniques.</li> <li>✓ To give strengths and limitations of existing packaging and domed shell-structures.</li> <li>✓ To evaluate the positions of where to join a shell-structure.</li> <li>✓ To evaluate how well a design protects the intended object.</li> <li>✓ To compare and contrast their design with their peers.</li> <li>✓ To deconstruct nets and domed shell-structures.</li> <li>✓ To understand how to strengthen a structure using corrugation, ribbing and lamination.</li> </ul>				<p style="text-align: center;"><b><u>Textiles</u></b></p> <ul style="list-style-type: none"> <li>✓ To gather information about a user's wants and needs.</li> <li>✓ To create annotated sketches of sewing techniques for a textile creation.</li> <li>✓ To generate prototypes of knife pleats, hems and gathers.</li> <li>✓ To use pins to join materials before stitching.</li> <li>✓ To use measurement ratios to create a template that is to scale.</li> <li>✓ To experiment with different ways of cutting fabric for aesthetic reasons and to prevent fraying.</li> <li>✓ To experiment with and select different ways of gathering material as a finishing technique.</li> <li>✓ To give strengths and limitations of back stitch, catch stitch and running stitch as joining techniques.</li> <li>✓ To compare and contrast ways of folding material (e.g. knife pleat and gathers)</li> <li>✓ To compare and contrast their design with their peers.</li> <li>✓ To sew using back stitch, running stitch and catch stitch.</li> <li>✓ To understand that a hem should be hidden.</li> <li>✓ To use folding of material (e.g. hems and pleats) as a finishing technique.</li> </ul>	<p style="text-align: center;"><b><u>Construction</u></b></p> <ul style="list-style-type: none"> <li>✓ To create annotated sketches of reinforcing techniques for a frame structure.</li> <li>✓ To generate prototypes of diagonal braces, gussets and butt joints.</li> <li>✓ To use a saw to cut wood safely.</li> <li>✓ To measure wood accurately.</li> <li>✓ To select suitable materials for reinforcing corners of wood</li> <li>✓ To explain ways their frame is supported and stable.</li> <li>✓ To compare and contrast their design with their peers.</li> <li>✓ To understand how to strengthen a frame using gussets and diagonal braces.</li> </ul>
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**YEAR 5**

			<p style="text-align: center;"><b><u>Mechanical Components</u></b></p> <ul style="list-style-type: none"> <li>✓ To use previous learning and scientific context to inform designs</li> </ul>		
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			<p>for a functional product with mechanical components.</p> <ul style="list-style-type: none"> <li>✓ To collect data on a user's wants and needs via a survey or interview.</li> <li>✓ To use exploded diagrams to demonstrate design ideas.</li> <li>✓ To create prototypes to evaluate an initial design.</li> <li>✓ To use construction kits with gears to mesh gears at right angles.</li> <li>✓ To make mechanical systems that involve the correct ratio (in gears: teeth to spin; in pulleys: length of pulley to frequency of turn).</li> <li>✓ To analyse and evaluate current designs that use mechanical components relating to intended user and purpose.</li> <li>✓ To evaluate their own and their peers' designs relating to efficiency and smoothness of movement at different points in the design process.</li> <li>✓ To recognise the mechanical differences between fixed, moveable and compound pulleys.</li> <li>✓ To understand how pulleys that are joined in different ways create movement</li> <li>✓ To understand how gear systems that are joined in different ways create movement.</li> </ul>	
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**YEAR 6**

		<p style="text-align: center;"><b><u>Electrical Components</u></b></p> <ul style="list-style-type: none"> <li>✓ To use previous learning and historical context to inform designs for a functional product with an electrical component linked to WWII (e.g. air raid siren).</li> <li>✓ To create detailing drawings and plans drawn to scale.</li> <li>✓ To make different series circuits comprising of different numbers of cells, buzzers and bulbs.</li> <li>✓ To apply scientific knowledge to alter a circuit for its functionality.</li> <li>✓ To use a computer control program to enable an electrical product to work automatically in response to changes in the environment.</li> <li>✓ To understand developments in D&amp;T and its impact on individuals and society.</li> <li>✓ To evaluate different electrical components and circuits and explain fully how electrical input and output is affected.</li> <li>✓ To know how more complex electrical circuits and components can be used to create functional products.</li> <li>✓ To know how to program a computer to control products.</li> <li>✓ To understand how circuit design affects output and functionality.</li> </ul>		<p style="text-align: center;"><b><u>Food and Nutrition</u></b></p> <ul style="list-style-type: none"> <li>✓ To know that food is grown, reared and caught in the UK, Europe and the wider world.</li> <li>✓ To recognise food products that are imported from South America.</li> <li>✓ To understand seasonality.</li> <li>✓ To understand that seasons affect food availability.</li> <li>✓ To understand the difference between cage-reared and free-range eggs.</li> <li>✓ To understand that different food and drink contain different substances (nutrients, water and fibre) that are needed for health.</li> <li>✓ To use knowledge of cooking and nutrition to adapt recipes.</li> <li>✓ To maintain a high level of hygiene when preparing food, including the use of different cloths for different surfaces to prevent cross-contamination.</li> </ul>
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				<ul style="list-style-type: none"><li>✓ To use a knife to peel, chop, dice and slice fresh ingredients for a savoury dish.</li><li>✓ To demonstrate safety measures when using a heat source.</li><li>✓ To accurately scale a recipe up or down.</li><li>✓ To accurately measure ingredients using standard units of measurement.</li></ul>
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