Design and Technology Long Term Plan

AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 1					
	Mechanical Components ✓ To talk about the purpose of a wheel. ✓ To talk about their own experience of vehicles with wheels. ✓ To talk about designs for vehicles to carry a toy. ✓ To make a drawing of a design for a four-wheel vehicle to carry a toy. ✓ To experiment with construction kits to make an object that moves. ✓ To attach wheels to a chassis using an axle with cotton reels and dowels. ✓ To attach wheels to a chassis using an axle with straws and paper wheels/ circles. ✓ To suggest reasons why a wheel and axle wobbles based on hole position. ✓ To talk about why their vehicle moves. ✓ To say what is similar about their and another vehicle. ✓ To recognise the different between fixed and freely moving axles. To understand what a wheel, chassis and axle is.		Food and Nutrition ✓ To understand that food comes from plants and animals. ✓ To sort fruits and vegetables based on colour, texture and taste. ✓ To understand that everyone should eat at least five portions of fruit and vegetables every day. ✓ To understand what a healthy meal is. ✓ To understand that hands and utensils need to be washed before cooking. ✓ To use a knife to cut fruit and vegetables into smaller pieces. ✓ To understand how to hold fruit and vegetables so that they can be cut safely. To use a spoon to mix.		
YEAR 2					
	Construction ✓ To talk about existing structures. ✓ To use pictures and words to plan and design a free-standing structure linked to London. ✓ To make and use templates. ✓ To make simple mock-ups of structures. ✓ To experiment with building free-standing structures using Polydron. ✓ To use folding as a strengthening technique. ✓ To use scissors to cut card and paper accurately. ✓ To use a straight edge to mark lines for cutting. ✓ To select suitable equipment to join materials (glue, tape, staples). ✓ To layer materials as a finishing technique to make them more		**Textiles** ✓ To talk about existing textile designs and print patterns. ✓ To use pictures and words to plan and design a textile product. ✓ To use IT to plan and design a textile product. ✓ To make and use templates. ✓ To use pins as a way of securing material and templates. ✓ To use chalk to draw around a template. ✓ To use scissors to cut templates and material accurately. ✓ To use a straight edge to mark lines for cutting. ✓ To select suitable equipment to join different parts of materials (glue, sewing, staples, pins). ✓ To say what they like and dislike about joining with sewing, gluing and pinning based on comfort and aesthetic choices. ✓ To evaluate different fabrics. ✓ To sew using overstitch.		

	appealing for the intended user. ✓ To learn about the designer Sir Christopher Wren and describe his work. ✓ To learn about designers of influential London landmarks. ✓ To say what they like and dislike about existing free-standing structures, referring to suitability of materials and stability. ✓ To recognise the intended user of a free-standing structure. ✓ To talk about what they have constructed and the techniques involved. ✓ To describe what they like about their own and partners' structure. ✓ To suggest one way the structure could have been changed by using a different construction material or joining technique. ✓ To talk about different construction materials. ✓ To describe how stable a structure is. ✓ To understand how a free-standing structure can be made more stable, stiffer and stronger.		✓ To understand the purpose of a template. ✓ To select a chosen fabric based on its properties. ✓ To apply finishing techniques of stencil printing and gluing. **Food and Nutrition** ✓ To state foods that come from plants and animals. ✓ To recognise foods relating to the Mexican culture. ✓ To sort foods based on where they have come from (farmed, grown elsewhere or caught). ✓ To suggest ways that at least five portions of fruit and vegetables can be eaten every day. ✓ To understand what a varied and healthy diet is, using the Eatwell Guide. ✓ To describe steps to take so that food is prepared hygienically. ✓ To use a knife to peel fruit and vegetables and to discard pips/ seeds. ✓ To understand how to use a grater safely. ✓ To use a spoon to measure quantities.		
YEAR 3					
	Construction ✓ To use research and previous learning to inform designs for a free-standing structure. ✓ To use labelled sketches and instructions to plan a design for a functional free-standing structure linked to the Iron Age. ✓ To test simple mock-ups of structure supports (including buttresses) ✓ To build free-standing structures that are supported by a buttress. ✓ To use scissors to score construction material. ✓ To draw accurate cutting lines using a ruler. ✓ To select suitable joining materials that provide hidden joins (glue, double-sided tape). ✓ To compare designs and support structures of chairs created by Ludwig Mies Van Der Rohe.	**Electrical Components** ✓ To use research and historical knowledge to inform designs for a mining helmet circuit. ✓ To use labelled sketches and instructions to plan a design for a mining helmet circuit. ✓ To test different circuit components ✓ To make different electrical systems. ✓ To evaluate how some key designs of engineers in design and technology have helped shape the world. ✓ To suggest ways mining helmets could change in the future. ✓ To evaluate different designs of mining helmet and how they meet the intended design purpose. ✓ To talk about ways their mining helmet functions electronically.		**Mechanical Components** ✓ To use research and historical knowledge to inform designs for a Shaduf. ✓ To use labelled sketches and instructions to plan a design for a Shaduf. ✓ To test different levers and pulleys for weight bearing. ✓ To make levers and pulleys that can lift different loads from a surface. ✓ To vary the position of the fulcrum to lift a load using a lever. ✓ To strengthen structures using previous learning. ✓ To compare Egyptian Shaduf designs with their own. ✓ To contrast Egyptian Shadufs with modern designs that use pulleys and levers. ✓ To evaluate how well their design lifts varying loads.	**Food and Nutrition** ✓ To understand that the Ancient Egyptians developed fermentation. ✓ To state some foods that contain gluten and yeast. ✓ To discuss about the way in which food processing can affect the taste, appearance, texture and colour of bread. ✓ To understand the need for covering dough to maintain hygiene during benching and proofing. ✓ To effectively disinfect surfaces. ✓ To develop kneading techniques and understand why a floured surface is required. ✓ To weigh dry ingredients using scales. ✓ To use a measuring jug.

	✓ To evaluate different ways of supporting a free-standing structure. ✓ To evaluate how well a design is functional. ✓ To talk about ways their free-standing structure is supported and can hold weight. ✓ To suggest ways a structure could be altered whilst still meeting the intended user's needs. ✓ To talk about the suitable properties of construction materials. ✓ To explain what a buttress is.	✓ To suggest ways their mining helmet could be altered to improve efficiency. ✓ To understand that electrical systems have an input, process and output. ✓ To know that electrical circuits and components can be used to create functional products. ✓ To understand what components a circuit requires. ✓ To recognise designs that require electrical circuits to be functional. ✓ To understand how to construct a circuit.		✓ To suggest ways their Shaduf could be altered to improve efficiency with the support of their peers. ✓ To recognise the difference between a lever and a pulley. ✓ To understand how to adapt a lever and a pulley based on load weight. ✓ To understand how pulleys and levers create movement.	
YEAR 4					
<u>Construction</u> ✓ To use evaluation of previous construction to design a shell-structure. ✓ To gather information about a user's wants and needs. ✓ To use CAD (computer-aided design) to model and explain ideas. ✓ To experiment with the construction of nets and domed shell-structures. ✓ To understand that corrugating, laminating and ribbing can be used to strengthen shell-structures. ✓ To use scissors to score joining flaps. ✓ To use computer-aided finishing techniques. ✓ To give strengths and limitations of existing packaging and domed shell-structures. ✓ To evaluate the positions of where to join a shell-structure. ✓ To evaluate how well a design protects the intended object. ✓ To compare and contrast their design with their peers. ✓ To deconstruct nets and domed shell-structures. ✓ To understand how to strengthen a structure using corrugation, ribbing and lamination.				**<u>Textiles</u>** ✓ To gather information about a user's wants and needs. ✓ To create annotated sketches of sewing techniques for a textile creation. ✓ To generate prototypes of knife pleats, hems and gathers. ✓ To use pins to join materials before stitching. ✓ To use measurement ratios to create a template that is to scale. ✓ To experiment with different ways of cutting fabric for aesthetic reasons and to prevent fraying. ✓ To experiment with and select different ways of gathering material as a finishing technique. ✓ To give strengths and limitations of back stitch, catch stitch and running stitch as joining techniques. ✓ To compare and contrast ways of folding material (e.g. knife pleat and gathers) ✓ To compare and contrast their design with their peers. ✓ To sew using back stitch, running stitch and catch stitch. ✓ To understand that a hem should be hidden. ✓ To use folding of material (e.g. hems and pleats) as a finishing technique.	**<u>Construction</u>** ✓ To create annotated sketches of reinforcing techniques for a frame structure. ✓ To generate prototypes of diagonal braces, gussets and butt joints. ✓ To use a saw to cut wood safely. ✓ To measure wood accurately. ✓ To select suitable materials for reinforcing corners of wood ✓ To explain ways their frame is supported and stable. ✓ To compare and contrast their design with their peers. ✓ To understand how to strengthen a frame using gussets and diagonal braces.
YEAR 5					
			<u>Mechanical Components</u> ✓ To use previous learning and scientific context to inform designs		

			for a functional product with mechanical components. ✓ To collect data on a user's wants and needs via a survey or interview. ✓ To use exploded diagrams to demonstrate design ideas. ✓ To create prototypes to evaluate an initial design. ✓ To use construction kits with gears to mesh gears at right angles. ✓ To make mechanical systems that involve the correct ratio (in gears: teeth to spin; in pulleys: length of pulley to frequency of turn). ✓ To analyse and evaluate current designs that use mechanical components relating to intended user and purpose. ✓ To evaluate their own and their peers' designs relating to efficiency and smoothness of movement at different points in the design process. ✓ To recognise the mechanical differences between fixed, moveable and compound pulleys. ✓ To understand how pulleys that are joined in different ways create movement ✓ To understand how gear systems that are joined in different ways create movement.		
YEAR 6					
		<u>Electrical Components</u> ✓ 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). ✓ To create detailing drawings and plans drawn to scale. ✓ To make different series circuits comprising of different numbers of cells, buzzers and bulbs. ✓ To apply scientific knowledge to alter a circuit for its functionality. ✓ To use a computer control program to enable an electrical product to work automatically in response to changes in the environment. ✓ To understand developments in D&T and its impact on individuals and society. ✓ To evaluate different electrical components and circuits and explain fully how electrical input and output us affected. ✓ To know how more complex electrical circuits and components can be used to create functional products. ✓ To know how to program a computer to control products. ✓ To understand how circuit design affects output and functionality.		**<u>Food and Nutrition</u>** ✓ To know that food is grown, reared and caught in the UK, Europe and the wider world. ✓ To recognise food products that are imported from South America. ✓ To understand seasonality. ✓ To understand that seasons affect food availability. ✓ To understand the difference between cage-reared and free-range eggs. ✓ To understand that different food and drink contain different substances (nutrients, water and fibre) that are needed for health. ✓ To use knowledge of cooking and nutrition to adapt recipes. ✓ To maintain a high level of hygiene when preparing food, including the use of different cloths for different surfaces to prevent cross-contamination.

				✓ To use a knife to peel, chop, dice and slice fresh ingredients for a savoury dish. ✓ To demonstrate safety measures when using a heat source. ✓ To accurately scale a recipe up or down. ✓ To accurately measure ingredients using standard units of measurement.