

Design and Technology Long Term Plan

AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
YEAR 1/2 Cycle A					
	<p><u>Mechanical Components</u></p> <ul style="list-style-type: none"> ✓ Designing ✓ To use their knowledge of a wheel, chassis and axle to design a vehicle to carry a toy. ✓ Making ✓ To know how objects move by experimenting with construction kits. ✓ To know how to make an effective chassis with wheels using an axle with cotton reels and dowels. ✓ Evaluating ✓ To know and explain why a wheel and axle wobbles based on hole position. ✓ To be able to evaluate why their vehicle moves. ✓ To be able to make comparisons between their vehicle and another. ✓ Technical Knowledge ✓ To know the purpose of a wheel. ✓ To know the difference between fixed and freely moving axles. ✓ To know what a wheel, chassis and axle is. 		<p><u>Food and Nutrition</u></p> <ul style="list-style-type: none"> ✓ To know that food comes from plants and animals. ✓ To know which familiar foods come from plants and which come from animals. ✓ To know that it is healthy for people to eat at least five portions of fruit and vegetables every day. ✓ To know what texture means. ✓ To be able to describe the texture and taste of food when eating it. ✓ To use knowledge of colour, texture and taste to sort fruits and vegetables. ✓ To know which types of food make a healthy meal. ✓ To know that hands and utensils need to be washed before cooking. ✓ To know how to hold fruit and vegetables so that they can be cut safely with a knife. ✓ To know how to mix with a spoon. 		
YEAR 1/2 Cycle B					

Construction

- ✓ Design
- ✓ To know that Sir Christopher Wren was an architect who designed buildings.
- ✓ To use knowledge of construction and joining materials to select the most suitable to design a model house.
- ✓ To know that a mock-up is used by designers and architects to test how well a design will work.
- ✓ **Making**
- ✓ To use knowledge of 3D shapes to build simple freestanding structures.
- ✓ To use knowledge of 2D shapes and simple nets to build free-standing structures using Polydron.
- ✓ To know how to use scissors to cut card and paper accurately and safely.

Textiles

- ✓ Design
- ✓ [To know that a mock-up is used by designers to test how well a design will work.]
- ✓ To use appropriate vocabulary when planning and designing a textile product.
- ✓ **Making**
- ✓ To know the purpose of a template and how to draw around it on a textile.
- ✓ To know how to use pins to secure material and templates.
- ✓ To know how to use scissors to cut templates and fabric accurately and safely.
- ✓ **Evaluating**
- ✓ To use their knowledge of joining materials and aesthetic qualities to evaluate their product.
- ✓ To use their knowledge of different materials to evaluate which are best to print on.

- ✓ To use knowledge of materials to explain how easy or difficult they are to cut.
- ✓ To use knowledge of joining materials to select the most suitable for a purpose.
- ✓ To know how to layer materials as a finishing technique to make them more appealing for the intended user.
- ✓ To know how to use templates to create a net.
- ✓ To know how to use a straight edge to mark lines for cutting.
- ✓ **Evaluating**
- ✓ To evaluate their model using knowledge of stability, effectiveness of construction and joining materials and finishing techniques.
- ✓ To use knowledge of construction to make changes to their model as appropriate.
- ✓ **Technical Knowledge**
- ✓ To know what a free-standing structure is.
- ✓ To know that designers use a wide range of different equipment to join materials.
- ✓ To know what makes a stable free-standing structure.

- ✓ **Technical Knowledge**
- ✓ To know what a textile is.
- ✓ To know the purpose of a lining and which materials and joining can be used.
- ✓ To know how to sew using overstitch.
- ✓ To select a chosen fabric based on its properties.

Food and Nutrition

- ✓ To sort foods using knowledge of where they have come from (farmed, grown elsewhere or caught).
- ✓ To know what proportions of different food groups make up a healthy diet.
- ✓ To know foods relating to the Mexican culture.
- ✓ To know how to use a knife safely to peel fruit and vegetables and to discard pips/seeds.
- ✓ To know how to use a grater safely.
- ✓ To know how to use a measuring spoon to measure quantities.
- ✓ To know the steps to take to make sure that food is prepared hygienically.

YEAR 3/4 Cycle A

	<p>Construction</p> <p>Designing</p> <ul style="list-style-type: none"> ✓ To use research and previous learning to inform designs for a free-standing structure. ✓ To know that Ludwig Mies Van Der Rohe was an architect and furniture designer who created simple, but stable frames for furniture. ✓ To use knowledge of structures, buttresses, joins and materials to design a freestanding replica of an iron age house. ✓ Apply DT knowledge to add labels and instructions to their work. <p>Making</p> <ul style="list-style-type: none"> ✓ To know how to create a mock-up to test a structure support. ✓ To use knowledge of structures, buttresses, joins and materials to create a 	<p>Electrical Components</p> <p>Design</p> <ul style="list-style-type: none"> ✓ To know how some key <ul style="list-style-type: none"> ○ designs of engineers in design and technology have helped shape the world. ✓ To use scientific knowledge of circuits to design a motorised product including a labelled diagram and instructions. ✓ To know how safety features need to be considered in the design of electrical products. ✓ To know that advancements in technology influence design over time. <p>Making</p> <ul style="list-style-type: none"> ✓ To use scientific knowledge to make simple electrical systems. ✓ To use scientific knowledge of circuits to design a working model mining helmet 		<p>Mechanical Components</p> <p>Designing</p> <ul style="list-style-type: none"> ✓ To know that William Armstrong was an engineer who designed the modern-day crane. ✓ To be able to identify differences and similarities in Egyptian Shadufs and modern designs that use pulleys and levers. ✓ To use research and historical knowledge to inform designs for a Shaduf, including labelled sketches and instructions. <p>Making</p> <ul style="list-style-type: none"> ✓ To know how to adapt a lever and a pulley based on load weight. ✓ To know that varying the position of the fulcrum affects how a lever lifts a load. ✓ To know the difference between a lever and a pulley and how they are used to create movement. ✓ To know how levers and pulleys can be adapted to bear weight. <p>Evaluating</p>	<p>Food and Nutrition</p> <ul style="list-style-type: none"> ✓ To know that the Ancient Egyptians developed fermentation. ✓ To know some foods that contain gluten and yeast. ✓ To know how 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 know how to effectively disinfect surfaces. ✓ To know how to knead and why a floured surface is required. ✓ To know how to weigh dry ingredients using scales. ✓ To know how to use a measuring jug. ✓ To know how the bread recipe can be altered by adding additional ingredients.
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	<p>freestanding replica of an iron age house.</p> <ul style="list-style-type: none"> ✓ To know when it is appropriate to use hidden joints in a structure. ✓ To know when it is appropriate to use scoring in a structure. <p>Evaluating</p> <ul style="list-style-type: none"> ✓ To use knowledge of supporting structures to evaluate their mock-ups. ✓ To use knowledge of properties of materials to evaluate their suitability for a buttress. ✓ To know how to evaluate if a design meets needs or requires altering. ✓ To use their knowledge of structure to evaluate how effective their replica is in supporting weight. <p>Technical Knowledge</p> <ul style="list-style-type: none"> ✓ To know properties of construction materials. ✓ To know what a buttress is – that it is used to reinforce or make an item more stable. ✓ To know how to create a hidden joint. ✓ To know how to score using scissors. 	<p>including a labelled diagram and instructions.</p> <p>Evaluating</p> <ul style="list-style-type: none"> ✓ To know how designs have been adapted over time to meet and improve design briefs. ✓ To know what a design flaw is and how it might be resolved. ✓ To know an electrical system can be altered to improve efficiency and apply this to their own design. <p>Technical Knowledge</p> <ul style="list-style-type: none"> ✓ To know that electrical systems are used in the design of some products. ✓ To know how a motorised circuit functions electronically. ✓ To know that electrical systems have an input, process and output. 		<ul style="list-style-type: none"> ✓ To be able to identify differences and similarities in Egyptian Shadufs and their own design. ✓ To use their knowledge of pulleys, levers, wheel movement and fulcrum to evaluate how well their design lifts varying loads. ✓ To know how to improve efficiency of their product. <p>Technical Knowledge</p> <ul style="list-style-type: none"> ✓ To know that pulleys and levers are used to lift, move and carry. ✓ To know what a fulcrum is. 	
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YEAR 3/4 Cycle B

<p>Construction and CAD</p> <p>Designing</p> <ul style="list-style-type: none"> ✓ To know that Robert Gair designed the folding carton. ✓ To know how to apply knowledge of techniques to a design brief. <p>Making</p> <ul style="list-style-type: none"> ✓ To use scissors to score joining flaps. ✓ To draw joining flaps accurately so that they can't be seen on the finished product. ✓ To use IT knowledge to create the net using CAD and evaluate the positions of where best to join the shell structure. <p>Evaluating</p> <ul style="list-style-type: none"> ✓ To use knowledge of the nets and joins to evaluate the strengths and limitations of existing packaging. 				<p>Textiles</p> <p>Designing</p> <ul style="list-style-type: none"> ✓ To know that Oswald Boateng is a British designer who mainly designs tailored clothing. ✓ To use their knowledge of back stitch and running stitch to annotate sketches to record differences in technique. ✓ To know how to apply knowledge of techniques to a design brief. ✓ To use knowledge of sewing techniques to create annotated sketches for a design brief. ✓ [To know what a mock up is and create one.] ✓ [To know how to create a prototype] and apply this to creating prototypes for knife pleats and gathers. 	<p>Construction</p> <p>Designing</p> <ul style="list-style-type: none"> ✓ To use knowledge of reinforcing techniques to annotate sketches for a frame structure. ✓ To know what diagonal braces and butt joints are and use this knowledge to create prototypes. ✓ [To know how to apply knowledge of techniques to a design brief.] <p>Making</p> <ul style="list-style-type: none"> ✓ To use a saw to cut wood safely. ✓ To measure wood accurately. ✓ To know how to, and explain, how a frame can be made stable and supported. <p>Evaluating</p> <ul style="list-style-type: none"> ✓ [To use subject specific language to compare and
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<ul style="list-style-type: none"> ✓ To use subject specific language to compare and contrast their design with their peers. <p>Technical Knowledge</p> <ul style="list-style-type: none"> ✓ To know that a shell structure has a solid outer layer which is flat or curved and it is hollow on the inside. ✓ To know where flaps can be drawn onto nets to join them to create a shell structure. ✓ To know how to use CAD to model and explain ideas. ✓ To know how to strengthen a structure using corrugating, laminating and ribbing. 	<p style="text-align: center;">✓</p>			<p>Making</p> <ul style="list-style-type: none"> ✓ To know how fabric can be cut in different ways to prevent fraying and to create different aesthetic results. ✓ To know how to create a prototype and apply these to hems. ✓ To apply mathematical knowledge of measurement ratios to create a template that is to scale. ✓ [To know how to use pins to join materials before stitching.] <p>Evaluating</p> <ul style="list-style-type: none"> ✓ To use knowledge of back stitch, catch stitch and running stitch to identify strengths and limitations of these as joining techniques. ✓ To use subject specific language to compare and contrast their design with their peers. <p>Technical Knowledge</p> <ul style="list-style-type: none"> ✓ To know how to thread a needle. ✓ To sew using back stitch, running stitch and catch stitch. ✓ To know that a hem should be hidden. ✓ To know different ways of folding material (e.g., knife pleat and gathers). 	<ul style="list-style-type: none"> ✓ contrast their design with their peers.] <p>Technical Knowledge</p> <ul style="list-style-type: none"> ✓ To know how a frame can be supported and made stable. ✓ To know which materials are suitable for reinforcing corners of wood. ✓ To know how to strengthen a frame using gussets and diagonal braces.
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YEAR 5/6 Cycle A

			<p style="text-align: center;"><u>Mechanical Components</u></p> <p>Design</p> <ul style="list-style-type: none"> ✓ To know that James Dyson is a designer and engineer who designs household products. ✓ To know how to use a survey to research intended users' wants and needs to inform the design process. ✓ To know how exploded diagrams can demonstrate the separate parts of a design and how they fit together. ✓ To know how prototypes can be used to test mechanical components in an initial design. <p>Making</p> <ul style="list-style-type: none"> ✓ To know that changing the length of rope on a fixed pulley affects 		
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the number of turns of the wheel needed to lift a load.
 To know how meshing gears at right angles can alter movement.

- ✓ To use knowledge of gears to create a functional product with mechanical components for an intended user.

Evaluating

- ✓ To use knowledge of gears to analyse and evaluate mechanical components in everyday objects.
- ✓ To use their knowledge of gears to evaluate their own and their peers' designs.

Technical Knowledge

- ✓ To know that fixed pulleys lift a load using a wheel, axle and rope.
- ✓ To know the mechanical differences between fixed, moveable and compound pulleys.
- ✓ To know that a gear is a rotating part of a machine that creates movement.
- ✓ To know how to calculate simple gear ratios.
- ✓ To know that gear ratio affects the rotational speed and direction of gears in a gear train.
- ✓ To know that coaxial gears are gears on the same axle.

YEAR 5/6 Cycle B

Electrical Components

Designing

- ✓ To know how to draw diagrams to scale.

Evaluating

- ✓ To know that Tim Berners-Lee changed everyday life with the invention of the World Wide Web.
- ✓ To know that developments in D&T have helped shape the world.
- ✓ To use knowledge of electrical systems to evaluate and improve the design and functionality of electrical circuits.

Technical Knowledge

- ✓ To know how to use a computer control program to enable an electrical product to work automatically in response to changes in the environment.
- ✓ To apply knowledge of electrical systems to design a circuit within a product for a purpose and intended user.

Food and Nutrition

- ✓ To know that food is grown, reared and caught in the UK, Europe and the wider world. To know that the seasons affect food availability, and this is called seasonality.
- ✓ To know that Rachel Green is a farmer and chef focussed on seasonality.
- ✓ To use knowledge of a healthy and varied diet to plan and evaluate meals for different lifestyles. To know that different varieties of the same type of food can vary in terms of cost,

				<p>convenience, nutritional value and taste.</p> <ul style="list-style-type: none">✓ To know the difference between cage-reared and free-range eggs.✓ To use knowledge of cooking, nutrition and seasonality to adapt recipes for different lifestyles and diets.✓ To know how to accurately scale a recipe up or down.
				<ul style="list-style-type: none">✓ To know what cross contamination is, and how to maintain a high level of hygiene when preparing raw and cooked food to prevent this.✓ To know how to remove bones from cooked fish so it is safe to eat.✓ To know how to use a heat source safely to prepare savoury dishes.✓ To know how to use a knife safely to peel, chop, dice and slice fresh ingredients for a savoury dish.