

Design Technology Progression Map

"Our DREAM is for greatness in our learning. To BELIEVE, in our unique talents and gifts and ACHIEVE a better world, living life to the full."



Structures

		EYFS (Reception)	
		<u>Junk modelling</u>	<u>Boats</u>
Skills	Design	<ul style="list-style-type: none"> • Making verbal plans and material choices. • Developing a junk model. 	<ul style="list-style-type: none"> • Designing a junk model boat. • Using knowledge from exploration to inform design.
	Make	<ul style="list-style-type: none"> • Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together. 	<ul style="list-style-type: none"> • Making a boat that floats and is waterproof, considering material choices.
	Evaluate	<ul style="list-style-type: none"> • Giving a verbal evaluation of their own and others' junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model. 	<ul style="list-style-type: none"> • Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it moves.
Knowledge	Technical	<ul style="list-style-type: none"> • To know there are a range to different materials that can be used to make a model and that they are all slightly different. • Making simple suggestions to fix their junk model. 	<ul style="list-style-type: none"> • To know that 'waterproof' materials are those which do not absorb water.
	Additional		<ul style="list-style-type: none"> • To know that some objects float and others sink. • To know the different parts of a boat.

King/Queen Throne

Skills	Design	<ul style="list-style-type: none"> • Generating and communicating ideas using sketching and modelling.
	Make	<ul style="list-style-type: none"> • Making a structure according to design criteria. • Creating joints and structures from paper/card and tape. • Building a strong and stiff structure by folding paper.
	Evaluate	<ul style="list-style-type: none"> • Testing the strength of own structure. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of own structure.
Knowledge	Technical	<ul style="list-style-type: none"> • To understand that the shape of materials can be changed to improve the strength and stiffness of structures. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily. • To understand that cylinders are a strong type of structure
	Additional	<ul style="list-style-type: none"> • To know that a client is the person I am designing for. • To know that design criteria is a list of points to ensure the product meets the clients needs and wants.

		<u>Constructing a castle</u>	<u>Pavilions</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. • Designing and/or decorating a castle tower on CAD software. 	<ul style="list-style-type: none"> • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.
	Make	<ul style="list-style-type: none"> • Constructing a range of 3D geometric shapes using nets . • Creating special features for individual designs. • Making facades from a range of recycled materials. 	<ul style="list-style-type: none"> • Creating a range of different shaped frame structures. • Making a variety of free standing frame structures of different shapes and sizes. • Selecting appropriate materials to build a strong structure and cladding. • Reinforcing corners to strengthen a structure. • Creating a design in accordance with a plan. • Learning to create different textural effects with materials.
	Evaluate	<ul style="list-style-type: none"> • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • Suggesting points for modification of the individual designs. 	<ul style="list-style-type: none"> • Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs.
Knowledge	Technical	<ul style="list-style-type: none"> • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. 	<ul style="list-style-type: none"> • To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own.
	Additional	<ul style="list-style-type: none"> • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack. • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. • To know that a design specification is a list of success criteria for a product. 	<ul style="list-style-type: none"> • To know that a pavilion is a decorative building or structure for leisure activities. • To know that cladding can be applied to structures for different effects. • To know that aesthetics are how a product looks. • To know that a product's function means its purpose. • To understand that the target audience means the person or group of people a product is designed for. • To know that architects consider light, shadow and patterns when designing.

Bridges

Skills	Design	<ul style="list-style-type: none"> • Designing a stable structure that is able to support weight. • Creating a frame structure with a focus on triangulation.
	Make	<ul style="list-style-type: none"> • Making a range of different shaped beam bridges. • Using triangles to create truss bridges that span a given distance and support a load. • Building a wooden bridge structure. • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks. • Using the correct techniques to saw safely. • Identifying where a structure needs reinforcement and using card corners for support. • Explaining why selecting appropriate materials is an important part of the design process. • Understanding basic wood functional properties.
	Evaluate	<ul style="list-style-type: none"> • Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. • Suggesting points for improvements for own bridges and those designed by others.
Knowledge	Technical	<ul style="list-style-type: none"> • To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood.
	Additional	<ul style="list-style-type: none"> • To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.

Mechanisms / mechanical systems		KS1		
		<u>Wheels and axles</u>	<u>Fairground wheel</u>	<u>Making a moving monster</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. • Creating clearly labelled drawings that illustrate movement. 	<ul style="list-style-type: none"> • Selecting a suitable linkage system to produce the desired motion. • Designing a wheel. 	<ul style="list-style-type: none"> • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.
	Make	<ul style="list-style-type: none"> • Adapting mechanisms, when: <ul style="list-style-type: none"> • they do not work as they should. • to fit their vehicle design. • to improve how they work after testing their vehicle. 	<ul style="list-style-type: none"> • Selecting materials according to their characteristics. • Following a design brief. 	<ul style="list-style-type: none"> • Making linkages using card for levers and split pins for pivots. • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. • Cutting and assembling components neatly.
	Evaluate	<ul style="list-style-type: none"> • Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move. 	<ul style="list-style-type: none"> • Evaluating different designs. • Testing and adapting a design. 	<ul style="list-style-type: none"> • Evaluating own designs against design criteria. • Using peer feedback to modify a final design.
Knowledge	Technical	<ul style="list-style-type: none"> • To know that wheels need to be round to rotate and move. • To understand that for a wheel to move it must be attached to a rotating axle. • To know that an axle moves within an axle holder which is fixed to the vehicle or toy. • To know that the frame of a vehicle (chassis) needs to be balanced. 	<ul style="list-style-type: none"> • To know that different materials have different properties and are therefore suitable for different uses. 	<ul style="list-style-type: none"> • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers.
	Additional	<ul style="list-style-type: none"> • To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles. 	<ul style="list-style-type: none"> • To know the features of a ferris wheel include the wheel, frame, pods, a base axle and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur. 	<ul style="list-style-type: none"> • To know some real-life objects that contain mechanisms.

Mechanisms / mechanical systems		KS2
		<u>Pop up book</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a pop-up book which uses a mixture of structures and mechanisms. • Naming each mechanism, input and output accurately. • make Storyboarding ideas for a book.
	Make	<ul style="list-style-type: none"> • Following a design brief to a pop up book, neatly and with focus on accuracy. • Making mechanisms and/or structures using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.
	Evaluate	N/A
Knowledge	Technical	<ul style="list-style-type: none"> • To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms.
	Additional	<ul style="list-style-type: none"> • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.

Electrical System		LKS2
		<u>Torches</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.
	Make	<ul style="list-style-type: none"> • Making a torch with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a torch according to the design and success criteria.
	Evaluate	<ul style="list-style-type: none"> • Evaluating electrical products. • Testing and evaluating the success of a final product.
Knowledge	Technical	<ul style="list-style-type: none"> • To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit.
	Additional	<ul style="list-style-type: none"> • To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.

Electrical System		KS2
		<u>Steady hand game</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a steady hand game - identifying and naming the components required. • Drawing a design from three different perspectives. • Generating ideas through sketching and discussion. • Modelling ideas through prototypes.
	Make	<ul style="list-style-type: none"> • Constructing a stable base for a game. • Accurately cutting, folding and assembling a net. • Decorating the base of the game to a high quality finish. • Making and testing a circuit. • Incorporating a circuit into a base.
	Evaluate	<ul style="list-style-type: none"> • Testing own and others finished games, identifying what went well and making suggestions for improvement.
Knowledge	Technical	<ul style="list-style-type: none"> • To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer.
	Additional	<ul style="list-style-type: none"> • To understand the diagram perspectives 'top view', 'side view' and 'back'.

Fruit and vegetables

Skills	Design	<ul style="list-style-type: none"> • Designing smoothie carton packaging by-hand or on ICT software.
	Make	<ul style="list-style-type: none"> • Chopping fruit and vegetables safely to make a smoothie. • Identifying if a food is a fruit or a vegetable. • Learning where and how fruits and vegetables grow.
	Evaluate	<ul style="list-style-type: none"> • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging.
Knowledge		<ul style="list-style-type: none"> • Understanding the difference between fruits and vegetables. • To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and a vegetable does not. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).

Eating seasonally

Skills	Design	<ul style="list-style-type: none"> • Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.
	Make	<ul style="list-style-type: none"> • Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. • Following the instructions within a recipe.
	Evaluate	<ul style="list-style-type: none"> • Establishing and using design criteria to help test and review dishes. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement when making a seasonal tart.
Knowledge		<ul style="list-style-type: none"> • To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country.. • To understand that imported foods travel from far away and this can negatively impact the environment. • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. • To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health. • To know safety rules for using, storing and cleaning a knife safely. • To know that similar coloured fruits and vegetables often have similar nutritional benefits.

What could be healthier?

Skills	Design	<ul style="list-style-type: none"> Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Writing an amended method for a recipe to incorporate the relevant changes to ingredients. Designing appealing packaging to reflect a recipe.
	Make	<ul style="list-style-type: none"> Cutting and preparing vegetables safely. Using equipment safely, including knives, hot pans and hobs. Knowing how to avoid cross-contamination. Following a step by step method carefully to make a recipe.
	Evaluate	<ul style="list-style-type: none"> Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups.
Knowledge		<ul style="list-style-type: none"> To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues. To know that I can adapt a recipe to make it healthier by substituting ingredients. To know that I can use a nutritional calculator to see how healthy a food option is. To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.

Textiles		EYFS: Reception	KS1
		<u>Bookmarks</u>	<u>Puppets</u>
Skills	Design	<ul style="list-style-type: none"> • Discussing what a good design needs. • Designing a simple pattern with paper. • Designing a bookmark. • Choosing from available materials. 	<ul style="list-style-type: none"> • Using a template to create a design for a puppet.
	Make	<ul style="list-style-type: none"> • Developing fine motor/cutting skills with scissors. • Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. • Using a prepared needle and wool to practise threading. 	<ul style="list-style-type: none"> • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction.
	Evaluate	<ul style="list-style-type: none"> • Reflecting on a finished product and comparing to their design. 	<ul style="list-style-type: none"> • Reflecting on a finished product, explaining likes and dislikes.
Knowledge		<ul style="list-style-type: none"> • To know that a design is a way of planning our idea before we start. • To know that threading is putting one material through an object. 	<ul style="list-style-type: none"> • To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples, glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look.

Textiles		LKS2
		<u>Fastenings</u>
Skills	Design	<ul style="list-style-type: none"> • Writing design criteria for a product, articulating decisions made. • Designing a personalised book sleeve.
	Make	<ul style="list-style-type: none"> • Making and testing a paper template with accuracy and in keeping with the design criteria. • Measuring, marking and cutting fabric using a paper template. • Selecting a stitch style to join fabric, working neatly by sewing small, straight stitches. • Incorporating fastening to a design.
	Evaluate	<ul style="list-style-type: none"> • Testing and evaluating an end product against the original design criteria. • Deciding how many of the criteria should be met for the product to be considered successful. • Suggesting modifications for improvement. • Articulating the advantages and disadvantages of different fastening types.
Knowledge		<ul style="list-style-type: none"> • To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. • To know that different fastening types are useful for different purposes. • To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.

Textiles		LKS2
		<u>Bunting</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a bunting in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions.
	Make	<ul style="list-style-type: none"> • Using a template when cutting fabric to ensure they achieve the correct shape. • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design. • Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating a bunting, attaching features (such as appliqué) using thread. • Finishing the bunting with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches.
	Evaluate	<ul style="list-style-type: none"> • Reflecting on their work continually throughout the design, make and evaluate process.
Knowledge		<ul style="list-style-type: none"> • To understand that it is important to design clothing with the client/ target customer in mind. • To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches.

Digital World		LKS2
		Electronic charm
Skills	Design	<ul style="list-style-type: none"> • Problem solving by suggesting potential features on a Micro: bit and justifying my ideas. • Developing design ideas for a technology pouch. • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.
	Make	<ul style="list-style-type: none"> • Using a template when cutting and assembling the pouch. • Following a list of design requirements. • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch. • Applying functional features such as using foam to create soft buttons.
	Evaluate	<ul style="list-style-type: none"> • Analysing and evaluating an existing product. • Identifying the key features of a pouch.
Knowledge	Technical	<ul style="list-style-type: none"> • To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. • To know that a Micro:bit is a pocket-sized, codeable computer.
	Additional	<ul style="list-style-type: none"> • To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. • To know that in Design and technology the term 'smart' means a programmed product. • To know the difference between analogue and digital technologies. • To understand what is meant by 'point of sale display.' • To know that CAD stands for 'Computer-aided design'.

Digital World		KS2
		<u>Navigating the world</u>
Skills	Design	<ul style="list-style-type: none"> • Writing a design brief from information submitted by a client. • Developing design criteria to fulfil the client's request. • Considering and suggesting additional functions for my navigation tool. • Developing a product idea through annotated sketches. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD.
	Make	<ul style="list-style-type: none"> • Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). • Explaining material choices and why they were chosen as part of a product concept. • Programming an N, E, S, W cardinal compass.
	Evaluate	<ul style="list-style-type: none"> • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Developing an awareness of sustainable design. • Identifying key industries that utilise 3D CAD modelling and explaining why. • Describing how the product concept fits the client's request and how it will benefit the customers. • Explaining the key functions in my program, including any additions. • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch. • Demonstrating a functional program as part of a product concept pitch.
Knowledge	Technical	<ul style="list-style-type: none"> • To know that accelerometers can detect movement. • To understand that sensors can be useful in products as they mean the product can function without human input.
	Additional	<ul style="list-style-type: none"> • To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request. • To know that 'multifunctional' means an object or product has more than one function. • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.