



## Design Technology Progression of Knowledge and Skills

### Progression of Knowledge

		EYFS	Year 1/2	Year 3/4	Year 5/6
<b>Structures</b>	<b>Technical</b>	<ul style="list-style-type: none"> <li>To know that there are a range of different materials that can be used to make a model and they are all slightly different.</li> <li>Making simple suggestions to fix their junk model.</li> <li>To know that 'waterproof' materials are those which do not absorb water.</li> </ul>	<ul style="list-style-type: none"> <li>To understand that the shape of materials can be changed to improve the strength and stiffness of structures.</li> <li>To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).</li> <li>To understand that axles are used in structures and mechanisms to make parts turn in a circle.</li> <li>To begin to understand that different structures are used for different purposes.</li> <li>To know that a structure is something that has been made and put together</li> </ul>		<ul style="list-style-type: none"> <li>To know that structures can be strengthened by manipulating materials and shapes.</li> </ul>
	<b>Additional</b>		<ul style="list-style-type: none"> <li>To know that a client is the person I am designing for.</li> <li>To know that design criteria is a list of points to ensure the product meets the clients' needs and wants.</li> <li>To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.</li> </ul>		<ul style="list-style-type: none"> <li>To understand what a 'footprint plan' is.</li> <li>To understand that in the real world, design, can impact users in positive and negative ways.</li> <li>To know that a prototype is a cheap model to test a design idea</li> </ul>

			<ul style="list-style-type: none"> <li>To know that windmill turbines use wind to turn and make the machines inside work.</li> <li>To know that a windmill is a structure with sails that are moved by the wind.</li> <li>To know the three main parts of a windmill are the turbine, axle and structure.</li> </ul>		
Mechanisms and Mechanical Systems	Technical		<ul style="list-style-type: none"> <li>To know that a mechanism is the parts of an object that move together.</li> <li>To know that a slider mechanism moves an object from side to side.</li> <li>To know that a slider mechanism has a slider, slots, guides and an object.</li> <li>To know that bridges and guides are bits of card that purposefully restrict the movement of the slider</li> </ul>	<ul style="list-style-type: none"> <li>To understand how pneumatic systems work. <ul style="list-style-type: none"> <li>To understand that pneumatic systems can be used as part of a mechanism.</li> <li>To know that pneumatic systems operate by drawing in, releasing and compressing air.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>To know that mechanisms control movement.</li> <li>To understand that mechanisms can be used to change one kind of motion into another.</li> <li>To understand how to use sliders, pivots and folds to create paper-based mechanisms.</li> </ul>
	Additional		<ul style="list-style-type: none"> <li>To know that in Design and technology we call a plan a 'design'.</li> </ul>	<ul style="list-style-type: none"> <li>To understand how sketches, drawings and diagrams can be used to communicate design ideas.</li> <li>To know that exploded-diagrams are used to show how different parts of a product fit together.</li> <li>To know that thumbnail sketches are small drawings to get ideas down on</li> </ul>	<ul style="list-style-type: none"> <li>To know that a design brief is a description of what I am going to design and make.</li> <li>To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</li> </ul>

Electrical Systems (KS2 Only)	Technical			paper quickly.	
	Additional				

- To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit.
- To understand common features of an electric product (switch, battery or plug, dials, buttons etc.).
- To list examples of common electric products (kettle, remote control etc.).
- To understand that an electric product uses an electrical system to work (function).
- To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits.

- 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

- To understand the importance and purpose of information design.
- To understand how material choices (such as mounting paper to corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached).

- To know that 'form' means the shape and appearance of an object.
- To know the difference between 'form' and 'function'.
- To understand that 'fit for purpose' means that a product works how it should and is easy to use.
- To know that form over purpose means that a product looks good but does not work very well.

					<ul style="list-style-type: none"><li>• To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind.</li><li>• To understand the diagram perspectives 'top view', 'side view' and 'back'</li></ul>
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Cooking and Nutrition	<p><b>Technical</b></p>	<ul style="list-style-type: none"> <li>• To know that soup is ingredients (usually vegetables) blended together.</li> <li>• To know that vegetables are grown.</li> <li>• To recognise some common vegetables.</li> <li>• To know that different vegetables taste different.</li> <li>• To know that eating vegetables is good for us.</li> <li>• To discuss why different packages might be used for different foods.</li> </ul>	<ul style="list-style-type: none"> <li>• To know that 'diet' means the food and drink that a person or animal usually eats.</li> <li>• To understand what makes a balanced diet.</li> <li>• To know where to find the nutritional information on packaging.</li> <li>• To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar.</li> <li>• To understand that I should eat a range of different foods from each food group, and roughly how much of each food group.</li> <li>• To know that nutrients are substances in food that all living things need to make energy, grow and develop.</li> <li>• To know that 'ingredients' means the items in a mixture or recipe.</li> <li>• To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy.</li> <li>• To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'</li> </ul>	<ul style="list-style-type: none"> <li>• To know that not all fruits and vegetables can be grown in the UK.</li> <li>• To know that climate affects food growth.</li> <li>• To know that vegetables and fruit grow in certain seasons. To know that cooking instructions are known as a 'recipe'.</li> <li>• To know that imported food is food which has been brought into the country.</li> <li>• To know that exported food is food which has been sent to another country..</li> <li>• To understand that imported foods travel from far away and this can negatively impact the environment.</li> <li>• To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.</li> <li>• To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.</li> <li>• To know safety rules for using, storing and cleaning a knife safely.</li> <li>• To know that similar coloured fruits and vegetables often</li> </ul>	<ul style="list-style-type: none"> <li>• To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.</li> <li>• To know that I can adapt a recipe to make it healthier by substituting ingredients.</li> <li>• To know that I can use a nutritional calculator to see how healthy a food option is.</li> <li>• 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</li> </ul>
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				have similar nutritional benefits.	
Textiles		<ul style="list-style-type: none"> <li>To know that a design is a way of planning our idea before we start.</li> <li>To know that threading is putting one material through an object</li> </ul>	<ul style="list-style-type: none"> <li>To know that 'joining technique' means connecting two pieces of material together.</li> <li>To know that there are various temporary methods of joining fabric by using staples, glue or pins.</li> <li>To understand that different techniques for joining materials can be used for different purposes.</li> <li>To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.</li> <li>To know that drawing a design idea is useful to see how an idea will look.</li> </ul>	<ul style="list-style-type: none"> <li>To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. <ul style="list-style-type: none"> <li>To know that when two edges of fabric have been joined together it is called a seam.</li> </ul> </li> <li>To know that it is important to leave space on the fabric for the seam.</li> <li>To understand that some products are turned inside out after sewing so the stitching is hidden</li> </ul>	

**Progression of Skills**

		<b>EYFS</b>	<b>Year 1/2</b>	<b>Year 3/4</b>	<b>Year 5/6</b>
<b>Structures</b>	<b>Design</b>	<ul style="list-style-type: none"> <li>• Making verbal plans and material choices.</li> <li>• Developing a junk model.</li> </ul>	<ul style="list-style-type: none"> <li>• Learning the importance of a clear design criteria.</li> <li>• Including individual preferences and requirements in a design</li> </ul>		<ul style="list-style-type: none"> <li>• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.</li> </ul>
	<b>Make</b>	<ul style="list-style-type: none"> <li>• Improving fine/scissor control skills with a variety of materials.</li> <li>• Joining materials in a variety of ways (temporary and permanent).</li> <li>• Joining different materials.</li> <li>• Describing their junk model and how they intend to put it together.</li> </ul>	<ul style="list-style-type: none"> <li>• Making stable structures from card, tape and glue .</li> <li>• Learning how to turn 2D nets into 3D structures.</li> <li>• Following instructions to cut and assemble the supporting structure of a windmill.</li> <li>• Making functioning turbines and axles which are assembled into a main supporting structure</li> </ul>		<ul style="list-style-type: none"> <li>• Building a range of play apparatus structures drawing upon new and prior knowledge of structures.</li> <li>• Measuring, marking and cutting wood to create a range of structures.</li> <li>• Using a range of materials to reinforce and add decoration to structures</li> </ul>
	<b>Evaluate</b>	<ul style="list-style-type: none"> <li>• Giving a verbal evaluation of their own and others' junk models with adult support.</li> <li>• Checking to see if their model matches their plan.</li> <li>• Considering what they would do differently if they did it again.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't</li> <li>• Suggest points for improvements.</li> </ul>		<ul style="list-style-type: none"> <li>• Improving a design plan based on peer evaluation.</li> <li>• Testing and adapting a design to improve it as it is developed.</li> <li>• Identifying what makes a successful structure.</li> </ul>

<b>Mechanisms and Mechanical Systems</b>	<b>Design</b>		<ul style="list-style-type: none"> <li>Explaining how to adapt mechanisms, using bridges or guides to control the movement.</li> <li>Designing a moving story book for a given audience</li> </ul>	<ul style="list-style-type: none"> <li>Designing a toy which uses a pneumatic system.</li> <li>Developing design criteria from a design brief.</li> <li>Generating ideas using thumbnail sketches and exploded diagrams.</li> <li>Learning that different types of drawings are used in design to explain ideas clearly.</li> </ul>	<ul style="list-style-type: none"> <li>Designing a pop-up book which uses a mixture of structures and mechanisms.</li> <li>Naming each mechanism, input and output accurately.</li> <li>Storyboarding ideas for a book</li> </ul>
	<b>Make</b>		<ul style="list-style-type: none"> <li>Following a design to create moving models that use levers and sliders.</li> </ul>	<ul style="list-style-type: none"> <li>Creating a pneumatic system to create a desired motion.</li> <li>Building secure housing for a pneumatic system.</li> <li>Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.</li> <li>Selecting materials due to their functional and aesthetic characteristics.</li> <li>Manipulating materials to create different effects by cutting, creasing, folding and weaving.</li> </ul>	<ul style="list-style-type: none"> <li>Following a design brief to make a pop up book, neatly and with focus on accuracy.</li> <li>Making mechanisms and/or structures using sliders, pivots and folds to produce movement.</li> <li>Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.</li> </ul>
	<b>Evaluate</b>		<ul style="list-style-type: none"> <li>Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed.</li> <li>Reviewing the success of a product by testing it with its intended audience</li> </ul>	<ul style="list-style-type: none"> <li>Using the views of others to improve designs.</li> <li>Testing and modifying the outcome, suggesting improvements. Understanding the purpose of exploded-diagrams through the eyes of a designer and their</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating the work of others and receiving feedback on own work.</li> <li>Applying points of improvement to their toys.</li> <li>Describing changes they would make/do if they were to do the project again.</li> </ul>



				client.	
Electrical Systems	Design			<ul style="list-style-type: none"> <li>• Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas.</li> <li>• Generate a final design for the electric poster with consideration to the client's needs and design criteria.</li> <li>• Design an electric poster that fits the requirements of a given brief.</li> <li>• Plan the positioning of the bulb (circuit component) and its purpose</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a steady hand game - identifying and naming the components required.</li> <li>• Drawing a design from three different perspectives.</li> <li>• Generating ideas through sketching and discussion. <ul style="list-style-type: none"> <li>• Modelling ideas through prototypes.</li> <li>• Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'</li> </ul> </li> </ul>
	Make			<ul style="list-style-type: none"> <li>• Create a final design for the electric poster.</li> <li>• Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear.</li> <li>• Measure and mark materials out using a template or ruler.</li> </ul>	<ul style="list-style-type: none"> <li>• Constructing a stable base for a game.</li> <li>• Accurately cutting, folding and assembling a net.</li> <li>• Decorating the base of the game to a high quality finish.</li> <li>• Making and testing a circuit.</li> <li>• Incorporating a circuit into a base</li> </ul>

				<ul style="list-style-type: none"> <li>• Fit an electrical component (bulb).</li> <li>• Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).</li> </ul>	
	<b>Evaluate</b>			<ul style="list-style-type: none"> <li>• Learning to give and accept constructive criticism on own work and the work of others.</li> <li>• Testing the success of initial ideas against the design criteria and justifying opinions.</li> <li>• Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Testing own and others finished games, identifying what went well and making suggestions for improvement.</li> <li>• Gathering images and information about existing children's toys.</li> <li>• Analysing a selection of existing children's toys</li> </ul>
<b>Cooking and Nutrition</b>	<b>Design</b>	<ul style="list-style-type: none"> <li>• Designing a soup recipe as a class.</li> <li>• Designing soup packaging.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a healthy wrap based on a food combination which works well together</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish</li> </ul>	<ul style="list-style-type: none"> <li>• Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.</li> <li>• Writing an amended method for a recipe to incorporate the relevant changes to ingredients.</li> <li>• Designing appealing packaging to reflect a recipe</li> </ul>
	<b>Make</b>	<ul style="list-style-type: none"> <li>• Chopping plasticine safely.</li> <li>• Chopping vegetables with support.</li> </ul>	<ul style="list-style-type: none"> <li>• Slicing food safely using the bridge or claw grip.</li> <li>• Constructing a wrap that meets a design brief</li> </ul>	<ul style="list-style-type: none"> <li>• Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.</li> <li>• Following the instructions within a recipe.</li> </ul>	<ul style="list-style-type: none"> <li>• Cutting and preparing vegetables safely.</li> <li>• Using equipment safely, including knives, hot pans and hobs.</li> <li>• Knowing how to avoid cross-contamination.</li> <li>• Following a step by step method carefully to make a recipe</li> </ul>

<b>Textiles</b>	<b>Evaluate</b>	<ul style="list-style-type: none"> <li>Tasting the soup and giving opinions.</li> <li>Describing some of the following when tasting food: look, feel, smell and taste.</li> <li>Choosing their favourite packaging design and explaining why.</li> </ul>	<ul style="list-style-type: none"> <li>Describing the taste, texture and smell of fruit and vegetables.</li> <li>Taste testing food combinations and final products.</li> <li>Describing the information that should be included on a label.</li> <li>Evaluating which grip was most effective</li> </ul>	<ul style="list-style-type: none"> <li>Establishing and using design criteria to help test and review dishes.</li> <li>Describing the benefits of seasonal fruits and vegetables and the impact on the environment.</li> <li>Suggesting points for improvement when making a seasonal tart.</li> </ul>	<ul style="list-style-type: none"> <li>Identifying the nutritional differences between different products and recipes.</li> <li>Identifying and describing healthy benefits of food groups</li> </ul>
	<b>Design</b>	<ul style="list-style-type: none"> <li>Discussing what a good design needs.</li> <li>Designing a simple pattern with paper.</li> <li>Designing a bookmark.</li> <li>Choosing from available materials.</li> </ul>	<ul style="list-style-type: none"> <li>Using a template to create a design for a puppet.</li> </ul>	<ul style="list-style-type: none"> <li>Designing and making a template from an existing cushion and applying individual design criteria</li> </ul>	
	<b>Make</b>	<ul style="list-style-type: none"> <li>Developing fine motor/cutting skills with scissors.</li> <li>Exploring fine motor/threading and weaving (under, over technique) with a variety of materials.</li> <li>Using a prepared needle and wool to practice treading.</li> </ul>	<ul style="list-style-type: none"> <li>Cutting fabric neatly with scissors.</li> <li>Using joining methods to decorate a puppet.</li> <li>Sequencing the steps taken during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Following design criteria to create an Egyptian collar.</li> <li>Selecting and cutting fabrics with ease using fabric scissors.</li> <li>Threading needles with greater independence.</li> <li>Tying knots with greater independence.</li> <li>Sewing cross stitch to join fabric.</li> <li>Decorating fabric using appliqué.</li> <li>Completing design ideas with embellishing on the collars based on design ideas.</li> </ul>	
	<b>Evaluate</b>	<ul style="list-style-type: none"> <li>Reflecting on a finished product and</li> </ul>	<ul style="list-style-type: none"> <li>Reflecting on a finished product, explaining likes and dislikes</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating an end product and thinking of other ways in which to create similar items</li> </ul>	

		comparing to their design.			
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