

# Design and Technology Knowledge and Progression of skills



	EYFS	Year 1	Year 2	Year 3	Year 4
<p><b>DESIGN Skills</b></p>	<ul style="list-style-type: none"> <li>Make verbal plans and material choices.</li> <li>Design and develop a junk model</li> <li>Use knowledge from exploration to inform design.</li> <li>Talk about what a good design needs.</li> <li>Design a simple pattern with paper.</li> <li>Design a bookmark.</li> <li>Choose from available materials</li> </ul>	<ul style="list-style-type: none"> <li>Learn the importance of a clear design criteria.</li> <li>Include individual preferences and requirements in a design.</li> <li>Design a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move.</li> <li>Create clearly labelled drawings that illustrate movement.</li> <li>Use a template to create a design for a puppet.</li> <li>Design a smoothie carton package by-hand or on ICT software.</li> </ul>	<ul style="list-style-type: none"> <li>Select a suitable linkage system to produce the desired motion.</li> <li>Design a wheel.</li> <li>Create a class design criterion for a moving monster.</li> <li>Design a moving monster for a specific audience in accordance with a design criterion.</li> <li>Design a pouch.</li> <li>Design a healthy wrap based on a food combination which works well together.</li> </ul>	<ul style="list-style-type: none"> <li>Design and develop a toy which uses a pneumatic system from a design brief.</li> <li>Generate ideas using thumbnail sketches and exploded diagrams.</li> <li>Learn that different types of drawings are used in design to explain ideas clearly.</li> <li>Problem solve by suggesting potential features on Micro: bit and justifying ideas.</li> <li>Develop design for a technology pouch.</li> <li>Draw and manipulate 2D shapes, using computer-aided design</li> <li>Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, consider taste, texture, smell and appearance of the dish.</li> </ul>	<ul style="list-style-type: none"> <li>Design a stable pavilion structure that is aesthetically pleasing.</li> <li>Build frames designed to support weight.</li> <li>Design a shape that reduces air resistance.</li> <li>Draw a net to create a structure from.</li> <li>Choose shapes that increase or decrease speed as a result of air resistance.</li> <li>Personalise a design.</li> <li>Write design criteria for a product, articulating decisions made.</li> <li>Design a personalised book sleeve</li> <li>Design a biscuit within a given budget, drawing upon previous taste testing judgements.</li> </ul>
<p><b>MAKE Skills</b></p>	<ul style="list-style-type: none"> <li>Improve fine motor/scissor skills with a variety of materials.</li> <li>Join materials in a variety of ways (temporary &amp; permanent).</li> <li>Join different materials together.</li> <li>Describe their junk model, and how they intend to put it together.</li> <li>Make a boat that floats and is waterproof, consider material choices.</li> <li>Develop fine motor/cutting skills with scissors.</li> <li>Explore fine motor/threading and weaving (under, over technique) with a variety of materials.</li> <li>Use a prepared needle and wool to practise threading</li> </ul>	<ul style="list-style-type: none"> <li>Make stable structures from card, tape and glue.</li> <li>Learn how to turn 2D nets into 3D structures.</li> <li>Follow instructions to cut and assemble the supporting structure of a windmill.</li> <li>Make functioning turbines and axles which are assembled into a main supporting structure</li> <li>Adapt mechanisms, when they don't work as they should, or fit their vehicle design or to improve how they work after testing their vehicle.</li> <li>Cut fabric neatly with scissors.</li> <li>Use joining methods to decorate a puppet.</li> <li>Sequence steps for construction.</li> <li>Chop fruit and vegetables safely to make a smoothie.</li> <li>Identify if a food is a fruit or a vegetable.</li> <li>Learn where and how fruits and vegetables grow</li> </ul>	<ul style="list-style-type: none"> <li>Select materials according to their characteristics.</li> <li>Follow a design brief.</li> <li>Make linkages using card for levers and split pins for pivots.</li> <li>Experiment with linkages adjusting the widths, lengths and thicknesses of card used.</li> <li>Cut and assemble components neatly</li> <li>Select and cut fabrics for sewing.</li> <li>Decorate a pouch using fabric glue or running stitch.</li> <li>Thread a needle.</li> <li>Sew running stitch, with evenly spaced, neat, even stitches to join fabric.</li> <li>Neatly pin and cut fabric using a template</li> <li>Slice food safely using the bridge or claw grip.</li> <li>Construct a wrap that meets a design brief</li> </ul>	<ul style="list-style-type: none"> <li>Create a pneumatic system for a desired motion.</li> <li>Build secure housing for a pneumatic system.</li> <li>Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.</li> <li>Select materials due to their functional and aesthetic characteristics.</li> <li>Manipulate materials to create different effects to cut, crease, fold and weave.</li> <li>Use a template when cutting and assembling the pouch.</li> <li>Follow a list of design requirements.</li> <li>Select and use the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.</li> <li>Apply functional features such as using foam to create soft buttons.</li> <li>Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.</li> <li>Follow the instructions within a recipe.</li> </ul>	<ul style="list-style-type: none"> <li>Make a variety of free-standing frame structures of different shapes and sizes.</li> <li>Select appropriate materials to build a strong structure and cladding.</li> <li>Reinforce corners to strengthen structure.</li> <li>Create design in accordance with a plan.</li> <li>Create textural effects with materials</li> <li>Measure, mark, cut and assemble with increasing accuracy.</li> <li>Make a model based on a chosen design.</li> <li>Follow a baking recipe, from start to finish, including the preparation of ingredients.</li> <li>Cook safely, following basic hygiene rules.</li> <li>Adapt a recipe to change it to meet new criteria (e.g. from savoury to sweet)</li> <li>Make and test a paper template with accuracy, keeping in the design criteria.</li> <li>Measure, mark and cut fabric using a paper template.</li> <li>Select a stitch style to join fabric, working neatly by sewing small, straight stitches.</li> <li>Incorporate fastening to a design.</li> </ul>
<p><b>EVALUATE Skills</b></p>	<ul style="list-style-type: none"> <li>Give a verbal evaluation of their own and others' junk models with adult support.</li> <li>Check to see if their model matches their plan.</li> <li>Consider what they would do differently if they did it again.</li> <li>Reflect on a finished product and compare to their design.</li> <li>Describe their favourite and least favourite part of their model.</li> <li>Make predictions about, and evaluate different materials to see if they are waterproof.</li> <li>Test to see which floats best.</li> <li>Test their design and reflect on what could have been done differently.</li> <li>Investigate how the shapes and structure of a boat affect the way it moves</li> </ul>	<ul style="list-style-type: none"> <li>Give a verbal evaluation of their own and others' junk models with adult support.</li> <li>Test wheel and axle mechanisms, identify what stops the wheels from turning, and recognise that a wheel needs an axle in order to move.</li> <li>Taste and evaluate different food combinations.</li> <li>Describe appearance, smell and taste.</li> <li>Suggest information to be included on packaging.</li> <li>Reflect on a finished product, explaining likes and dislike</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate different designs.</li> <li>Test and adapt a design.</li> <li>Evaluate own designs against design criteria.</li> <li>Use peer feedback to modify a final design.</li> <li>Evaluate which grip was most effective</li> <li>Troubleshoot scenarios posed by teacher.</li> <li>Evaluate the quality of the stitching on others' work</li> <li>Discuss as a class, the success of their stitching against the success criteria.</li> <li>Identify aspects of their peers' work that they particularly like and why.</li> <li>Describe the taste, texture and smell of fruit and vegetables.</li> <li>Taste test food combinations and final products.</li> <li>Describe the information that should be included on a label.</li> </ul>	<ul style="list-style-type: none"> <li>Use the views of others to improve designs.</li> <li>Test and modify the outcome, suggesting improvements.</li> <li>Understand the purpose of exploded-diagrams through the eyes of a designer and their client.</li> <li>Suggesting points for improvement when making a seasonal tart.</li> <li>Analysing and evaluating an existing product.</li> <li>Identifying the key features of a pouch</li> <li>Establish and use design criteria to help test and review dishes.</li> <li>Describe the benefits of seasonal fruits and vegetables and the impact on the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate structures made by the class.</li> <li>Describe what characteristics of a design and construction made it the most effective.</li> <li>Consider effective and ineffective designs</li> <li>Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance</li> <li>Evaluate a recipe, consider: taste, smell, texture and appearance.</li> <li>Describe the impact of the budget on the selection of ingredients.</li> <li>Evaluate and compare food products.</li> <li>Suggest modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins</li> <li>Test and evaluate an end product against the original design criteria.</li> <li>Decide the criteria that should be met for the product to be considered successful.</li> <li>Suggest modifications for improvement.</li> <li>Articulate the advantages and disadvantages of different fastening types</li> </ul>

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<b>KNOWLEDGE</b>	<ul style="list-style-type: none"> <li>To know there are a range of different materials that can be used to make a model and that they are all slightly different.</li> <li>To know that 'waterproof' materials are those which do not absorb water.</li> <li>To know that some objects float and others sink.</li> <li>To know the different parts of a boat.</li> <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 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 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> <li>To know that wheels need to be round to rotate and move.</li> <li>To understand that for a wheel to move it must be attached to a rotating axle.</li> <li>To know that an axle moves within an axle holder which is fixed to the vehicle or toy.</li> <li>To know that the frame of a vehicle (chassis) needs to be balanced.</li> <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 meet the client's 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> <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> <li>To know some real-life items, use wheels such as wheelbarrows, hamsters and vehicles.</li> <li>To know that 'joining technique' means connecting two pieces of material together.</li> <li>To know that there are temporary methods of joining fabric by using staples, glue or pins.</li> <li>To understand different techniques for joining materials can be used for different purposes.</li> <li>To understand that a template 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> <li>To understand that some foods known as vegetables are fruits (e.g. cucumber).</li> <li>To know a blender is a machine which mixes ingredients together into a smooth liquid.</li> <li>To know that a fruit has seeds and a vegetable does not.</li> <li>To know that fruits grow on trees or vines.</li> <li>To know that vegetables can grow either above or below ground.</li> <li>To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).</li> </ul>	<ul style="list-style-type: none"> <li>To know that different materials have different properties and are therefore suitable for different uses.</li> <li>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</li> <li>To know that there is always an input and output in a mechanism.</li> <li>To know that an input is the energy that is used to start something working.</li> <li>To know that an output is the movement that happens as a result of the input.</li> <li>To know that a lever is something that turns on a pivot.</li> <li>To know that a linkage mechanism is made up of a series of levers.</li> <li>To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.</li> <li>To know that it is important to test my design as I go along so that I can solve any problems that may occur.</li> <li>To know some real-life objects that contain mechanisms.</li> <li>To know that sewing is a method of joining fabric.</li> <li>To know that different stitches can be used when sewing.</li> <li>To understand the importance of tying a knot after sewing the final stitch.</li> <li>To know that a thimble can be used to protect my fingers when sewing</li> <li>Understand the difference between fruits and vegetables.</li> <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 understand how pneumatic systems work.</li> <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> <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 paper quickly.</li> <li>To understand that, in programming, a 'loop' is code that repeats something again and again until stopped.</li> <li>To know that a Micro:bit is a pocket-sized, codeable computer.</li> <li>To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result.</li> <li>To know that in Design and technology the term 'smart' means a programmed product.</li> <li>To know the difference between analogue and digital technologies.</li> <li>To understand what is meant by 'point of sale display.'</li> <li>To know that CAD stands for 'Computer-aided design'.</li> <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.</li> <li>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 have similar nutritional benefits.</li> </ul>	<ul style="list-style-type: none"> <li>To understand what a frame structure is.</li> <li>To know that a 'free-standing' structure is one which can stand on its own.</li> <li>To know that air resistance is the level of drag on an object as it is forced through the air.</li> <li>To understand that the shape of a moving object will affect how it moves due to air resistance.</li> <li>To know that a pavilion is a decorative building or structure for leisure activities.</li> <li>To know that cladding can be applied to structures for different effects.</li> <li>To know that aesthetics are how a product looks.</li> <li>To know that a product's function means its purpose.</li> <li>To understand that the target audience means the person or group of people a product is designed for.</li> <li>To know that architects consider light, shadow and patterns when designing</li> <li>To know that aesthetics means how an object or product looks in design and technology.</li> <li>To know that a template is a stencil you can use to help you draw the same shape accurately.</li> <li>To know that a birds-eye view means a view from a high angle (as if a bird in flight).</li> <li>To know that graphics are images which are designed to explain or advertise something.</li> <li>To know that it is important to assess and evaluate design ideas and models against a list of design criteria.</li> <li>To know that the amount of an ingredient in a recipe is known as the 'quantity.'</li> <li>To know that it is important to use oven gloves when removing hot food from an oven.</li> <li>To know the following cooking techniques: sieving, creaming, rubbing method, cooling.</li> <li>To understand the importance of budgeting while planning ingredients for biscuits</li> <li>To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro.</li> <li>To know that different fastening types are useful for different purposes.</li> <li>To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.</li> </ul>