

Design Technology Layer 2: Knowledge and Skills Progression



BACKGROUND RESEARCH							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>As a designer:</p> <p>I can explore different materials, using all my senses to investigate them.</p> <p>I can manipulate and play with different materials.</p> <p>I can explore different materials freely, to develop their own ideas about how to use them and what to make.</p>	<p>As a designer:</p> <p>I can explore different materials freely and build upon previous learning to refine and develop my ideas about how to use them and what to make.</p>	<p>As a designer:</p> <p>I understand what a product is and who it is for.</p> <p>I understand how a product works and how it is used.</p> <p>I can identify where you might find this product.</p>	<p>As a designer:</p> <p>I understand what a product is and who it is for.</p> <p>I understand how a product works and how it is used.</p> <p>I can identify where you might find this product.</p> <p>I can identify the materials used to make the product.</p> <p>I can express and opinion about a product.</p>	<p>As a designer:</p> <p>I can identify who made the product, when it was made and what its purpose is.</p> <p>I can identify what the product has been made from.</p> <p>I can evaluate the product on design and use.</p>	<p>As a designer:</p> <p>I can identify who made the product, when it was made and what its purpose is.</p> <p>I can identify what the product has been made from and where I can get the materials.</p> <p>I can evaluate the product on design and use.</p>	<p>As a designer:</p> <p>I can identify who made the product, when it was made and what its purpose is.</p> <p>I can identify what the product has been made from and how environmentally friendly the materials are.</p> <p>I can evaluate the product on design, appearance and use.</p> <p>I can identify the cost to make the product.</p>	<p>As a designer:</p> <p>I can identify who made the product, when it was made and what its purpose is.</p> <p>I can identify what the product has been made from and how environmentally friendly the materials are.</p> <p>I can evaluate the product on design, appearance and use.</p> <p>I can identify the cost to make the product and whether it has any other purposes (for example Leading innovation of the time, trend setting)</p>

DESIGN							
Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>I can use my imagination to think about what I can do with different materials.</p> <p>I can develop my own ideas and then decide which materials to use to express them.</p>	<p>I can think of and discuss what I would like to make given a range of materials.</p>	<p>I can use my own ideas to design something.</p> <p>I can describe how my idea works.</p> <p>I can design a product which moves.</p> <p>I can explain to someone else how I want to make my product.</p> <p>I can make a simple plan before making.</p>	<p>I can think of an idea and plan what to do next.</p> <p>I can explain why I have chosen specific textiles.</p>	<p>I can prove that a design meets a set criteria.</p> <p>I can design a product and make sure that it looks attractive.</p> <p>I can choose a material for both its suitability and its appearance.</p>	<p>I can use ideas from other people when I am designing.</p> <p>I can produce a plan and explain it.</p> <p>I can persevere and adapt work when original ideas do not work.</p> <p>I can communicate ideas in a range of ways including by sketches and drawings which are annotated.</p>	<p>I can come up with a range of ideas after collecting information from different sources.</p> <p>I can produce a detailed, step by step plan.</p> <p>I can explain how a product will appeal to a specific audience.</p> <p>I can design a product that requires pulleys or gears.</p>	<p>I can use market research to inform my plans and ideas.</p> <p>I can follow and refine original plans.</p> <p>I can justify my plans in a convincing way.</p> <p>I can show that I consider culture and society in my plans and designs.</p>

MAKE

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>As a designer:</p> <p>I can make simple models which express their ideas.</p> <p>I can join different materials and explore different textures.</p>	<p>As a designer:</p> <p>I can use different techniques for joining materials, such as how to use adhesive tape and different sorts of glue.</p> <p>I am beginning to use a range of materials and tools independently</p>	<p>As a designer:</p> <p>I can use my own ideas to make something.</p> <p>I can make a product which moves.</p> <p>I can choose appropriate resources and tools.</p>	<p>As a designer:</p> <p>I can choose tools and materials and explain why I have chosen them.</p> <p>I can join materials and components in different ways.</p> <p>I can measure materials to use in a model or structure.</p>	<p>As a designer:</p> <p>I can follow a step-by-step plan, choosing the right equipment and materials.</p> <p>I can select the most appropriate tools and techniques for a given tasks.</p> <p>I can make a product which uses both electrical and mechanical components.</p> <p>I can work accurately to measure, make cuts and make holes.</p>	<p>As a designer:</p> <p>I know which tools to use for a particular task and show knowledge of handling the tool.</p> <p>I know which material is likely to give the best outcome.</p> <p>I can measure accurately.</p>	<p>As a designer:</p> <p>I can use a range of tools and equipment competently.</p> <p>I can make a prototype before making a final version.</p> <p>I can make a product that relies on pulleys and gears.</p>	<p>As a designer:</p> <p>I know which tool to use for a specific practical task.</p> <p>I know how to use any tool correctly and safely.</p> <p>I know what each tool is used for.</p> <p>I can explain why a specific tool is best for a specific action.</p>

EVALUATE

Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>As a designer:</p> <p>I can tell you what I have made and how I made it.</p>	<p>As a designer:</p> <p>I can discuss problems and suggest how they may be solved.</p> <p>I can say whether I have achieved my aims.</p>	<p>As a designer:</p> <p>I can describe how something works.</p> <p>I can explain what works well and not so well in the model I have made.</p>	<p>As a designer:</p> <p>I can explain what went well with my work.</p>	<p>As a designer:</p> <p>I can explain how to improve my finished model.</p> <p>I know why a model has or has not been successful.</p>	<p>As a designer:</p> <p>I can evaluate and suggest improvements for a design.</p> <p>I can evaluate products both for their purpose and their appearance.</p> <p>I can explain how the original design has been improved.</p> <p>I can present a product in an interesting way.</p>	<p>As a designer:</p> <p>I can suggest alternative plans; outlining the positive features and the drawbacks.</p> <p>I can evaluate appearance and function against original criteria.</p>	<p>As a designer:</p> <p>I know how to test and evaluate designed products.</p> <p>I can explain how products should be stored and give reasons.</p> <p>I can evaluate my product against clear criteria.</p>

COOKING AND NUTRITION

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Technical Knowledge	<p>Name and identify 3 fruits and 3 vegetables.</p> <p>Understand the importance of good hand hygiene.</p>	<p>Understand the difference between fruits and vegetables.</p> <p>Understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).</p> <p>Know that a blender is a machine which mixes ingredients together into a smooth liquid.</p>	<p>Know that 'diet' means the food and drink that a person or animal usually eats.</p> <p>Understand what makes a balanced diet.</p> <p>Know where to find the nutritional information on packaging.</p> <p>Know that 'ingredients' means the items in a mixture or recipe.</p> <p>Know that the recommended maximum amount of sugar is five teaspoons of sugar a day.</p>	<p>Know that not all fruits and vegetables can be grown in the UK.</p> <p>Know that vegetables and fruit grow in certain seasons.</p> <p>Know that cooking instructions are known as a 'recipe'.</p> <p>Know that each fruit and vegetable give us nutritional benefits because they contain vitamins, minerals and fibre.</p> <p>Understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.</p> <p>Know safety rules for using, storing and cleaning a knife safely.</p>	<p>Know that the amount of an ingredient in a recipe is known as the 'quantity.'</p> <p>Know that it is important to use oven gloves when removing hot food from an oven.</p> <p>Know the following cooking techniques: sieving, creaming, rubbing method, cooling.</p> <p>Understand the importance of budgeting while planning ingredients for biscuits.</p>	<p>Understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.</p> <p>Know that I can adapt a recipe to make it healthier by substituting ingredients.</p> <p>Know that I can use a nutritional calculator to see how healthy a food option is.</p> <p>Understand that 'cross-contamination' means when bacteria is spread between food, surfaces or equipment.</p>	<p>Know that 'flavour' is how a food or drink tastes.</p> <p>Know that many countries have 'national dishes' which are recipes associated with that country.</p> <p>Know that 'processed food' means food that has been put through multiple changes in a factory.</p> <p>Understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides.</p> <p>Understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).</p>
Skills	<p>Slice and chop vegetables safely.</p> <p>Use tools to prepare ingredients safely.</p>	<p>Chop fruit and vegetables safely.</p> <p>Identify if a food is a fruit or a vegetable.</p>	<p>Slice food safely using the bridge or claw grip.</p>	<p>Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.</p> <p>Follow the instructions within a recipe.</p>	<p>Follow a baking recipe, from start to finish, including the preparation of ingredients.</p> <p>Cooking safely, following basic hygiene rules.</p> <p>Adapt a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet).</p>	<p>Cut and prepare vegetables safely.</p> <p>Use equipment safely, including knives, hot pans and hobs.</p> <p>Know how to prevent <u>'cross contamination'</u>.</p> <p>Follow a step by step method carefully to make a recipe.</p>	<p>Follow a recipe, including using the correct quantities of each ingredient.</p> <p>Adapt a recipe based on research.</p> <p>Work to a given timescale.</p> <p>Work safely and hygienically with independence.</p>

STRUCTURES

	Reception	Key Stage One	Lower Key Stage 2	Upper Key Stage 2
Technical Knowledge	<p>Know there are a range of different materials that can be used to make a model and that they are all slightly different.</p> <p>Make simple suggestions to fix their junk model.</p>	<p>Understand that the shape of materials can be changed to improve the strength and stiffness of structures.</p> <p>Understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).</p> <p>Understand that axles are used in structures and mechanisms to make parts turn in a circle.</p> <p>Begin to understand that different structures are used for different purposes.</p> <p>Know that a structure is something that has been made and put together.</p>	<p>Understand that wide and flat based objects are more stable.</p> <p>Understand the importance of strength and stiffness in structures.</p> <p>Know that a paper net is a flat 2D shape that can become a 3D shape once assembled</p>	<p>Know that structures can be strengthened by manipulating materials and shapes.</p> <p>Understand what a 'footprint plan' is.</p>
Skills	<p>Improve fine motor/scissor skills with a variety of materials.</p> <p>Join materials in a variety of ways (temporary and permanent).</p> <p>Join different materials together.</p>	<p>Make stable structures from card, tape and glue.</p> <p>Learn how to turn 2D nets into 3D structures.</p> <p>Follow instructions to cut and assemble the supporting structure of a lighthouse</p> <p>Make functioning turbines and axles which are assembled into a main supporting structure.</p>	<p>Construct a range of 3D geometric shapes using nets.</p> <p>Create special features for individual designs.</p> <p>Make facades from a range of recycled materials</p>	<p>Build a range of play apparatus structures drawing upon new and prior knowledge of structures.</p> <p>Measure, mark and cut wood to create a range of structures.</p> <p>Use a range of materials to reinforce and add decoration to structures</p>

TEXTILES

	Reception	Key Stage One	Lower Key Stage 2	Upper Key Stage 2
Technical Knowledge	<p>Know that threading is putting one material through an object.</p>	<p>Know that 'joining technique' means connecting two pieces of material together.</p> <p>Know that there are various temporary methods of joining fabric by using staples, glue or pins.</p> <p>Understand that different techniques for joining materials can be used for different purposes.</p> <p>Understand that a template (or fabric pattern) is used to cut out the same shape multiple times.</p> <p>Know that drawing a design idea is useful to see how an idea will look.</p>	<p>Know that sewing is a method of joining fabric.</p> <p>Know that different stitches can be used when sewing.</p> <p>Understand the importance of tying a knot after sewing the final stitch.</p> <p>Know that a thimble can be used to protect my fingers when sewing.</p>	<p>Know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.</p> <p>Know that when two edges of fabric have been joined together it is called a seam.</p> <p>Know that it is important to leave space on the fabric for the seam.</p> <p>Understand that some products are turned inside out after sewing so the stitching is hidden.</p>
Skills	<p>Develop fine motor/cutting skills with scissors.</p> <p>Explore fine motor/threading and weaving (under, over technique) with a variety of materials.</p> <p>Use a prepared needle and wool to practise threading.</p>	<p>Cut fabric neatly with scissors.</p> <p>Use joining methods to decorate a puppet.</p> <p>Sequencing steps for construction.</p>	<p>Select and cut fabrics for sewing.</p> <p>Decorate a pouch/ using fabric glue or running stitch.</p> <p>Thread a needle.</p> <p>Sew using running stitch, with evenly spaced, neat, even stitches to join fabric.</p> <p>Neatly pin and cut fabric using a template.</p>	<p>Select and cut fabrics with ease using fabric scissors.</p> <p>Thread needles with greater independence.</p> <p>Tie knots with greater independence.</p> <p>Join two pieces of fabric using a blanket stitch</p> <p>Decorate fabric using appliqué or decorative stitching</p>

MECHANISMS and MECHANICAL SYSTEMS (Key Stage One and Two only)

	Key Stage One	Lower Key Stage 2	Upper Key Stage 2
Technical Knowledge	<p>Know that wheels need to be round to rotate and move.</p> <p>Understand that for a wheel to move it must be attached to a rotating axle.</p> <p>Know that an axle moves within an axle holder which is fixed to the vehicle or toy.</p> <p>Know that the frame of a vehicle (chassis) needs to be balanced.</p> <p>Know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</p> <p>Know that a lever is something that turns on a pivot.</p> <p>Know that a linkage mechanism is made up of a series of levers.</p>	<p>Understand how pneumatic systems work.</p> <p>Understand that pneumatic systems can be used as part of a mechanism.</p> <p>Know that pneumatic systems operate by drawing in, releasing and compressing air.</p>	<p>Know that air resistance is the level of drag on an object as it is forced through the air.</p> <p>Understand that the shape of a moving object will affect how it moves due to air resistance.</p> <p>Know that a template is a stencil you can use to help you draw the same shape accurately.</p>
Skills	<p>Adapt mechanisms, when:</p> <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. <p>Make linkages using card for levers and split pins for pivots.</p> <p>Experiment with linkages adjusting the widths, lengths and thicknesses of card used.</p> <p>Cut and assemble components neatly.</p>	<p>Create a pneumatic system to create a desired motion.</p> <p>Build secure housing for a pneumatic system.</p> <p>Use syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy.</p> <p>Select materials due to their functional and aesthetic characteristics.</p> <p>Manipulate materials to create different effects by cutting, creasing, folding and weaving.</p>	<p>Measure, mark, cut and assemble with increasing accuracy.</p> <p>Make a model based on a chosen design.</p>

ELECTRICAL SYSTEMS (Key Stage 2 only)

	Lower Key Stage 2	Upper Key Stage 2
Technical Knowledge	<p>Know that an electrical circuit must be complete for electricity to flow.</p> <p>Know that a switch can be used to complete and break an electrical circuit</p>	<p>Know when there is a break in a series circuit, all components turn off</p> <p>Know that batteries contain acid, which can be dangerous if they leak.</p> <p>Know the names of the components in a basic series circuit, including a buzzer</p>
Skills	<p>Make a torch with a working electrical circuit and switch.</p> <p>Use appropriate equipment to cut and attach materials.</p> <p>Assemble a torch according to the design and success criteria.</p>	<p>Construct a stable base for a game and incorporate a circuit into the base.</p> <p>Accurately cut, fold and assemble a net.</p> <p>Decorate the base of the game to a high-quality finish.</p> <p>Make and test a circuit.</p>