



Star

NURTURING TODAY'S **YOUNG PEOPLE**,
INSPIRING TOMORROW'S **LEADERS**

Design and Technology Progression Map





Substantive Knowledge. Pupils should know that:				
	Year R	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
TEXTILES		<p>A running stitch can be used to join two pieces of fabric together.</p> <p>A template (or fabric pattern) is used to cut out the same shape multiple time.</p>	<p>A cross-stitch is stronger than a running stitch because it works in different directions.</p> <p>Applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.</p> <p>When two edges of fabric have been joined together it is called a seam.</p> <p>It is important to leave space on the fabric for the seam.</p> <p>Some products are turned inside out after sewing so the stitching is hidden.</p>	<p>The blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric.</p> <p>The back stitch is a strong stitch and also be used for decoration.</p> <p>Small, neat stitches which are pulled taut are important, including when creating seams.</p> <p>Using a template (or clothing pattern) helps to accurately mark out a design on fabric.</p>
COOKING AND NUTRITION	<p>All food comes from plants or animals.</p> <p>The names of key, basic foodstuffs; some foods are healthy and some are unhealthy.</p> <p>Everyone should eat at least five portions of fruit and vegetables every day.</p>	<p>All food comes from plants or animals, and that food has to be farmed, grown elsewhere (e.g. home) or caught.</p> <p>The names and groups of some foods, according to the Eatwell Plate.</p> <p>Everyone should eat at least five portions of fruit and vegetables every day.</p> <p>There are 'hidden sugars'.</p> <p>There is nutritional information on a drinks containers.</p>	<p>Food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world.</p> <p>A healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell Plate.</p> <p>To be active and healthy, food and drink are needed to provide energy for the body.</p>	<p>Different food and drink contain different substances – nutrients, water and fibre – that are needed for health, and make comparisons between different foodstuffs.</p> <p>About nutritional labelling on food packets and make comparisons.</p> <p>Recipes can be adapted to change the appearance, taste, texture and aroma.</p>
Mechanical Systems/ Electrical Systems		<p>A mechanism is the parts of an object that move together.</p> <p>A slider mechanism moves an object in a straight line.</p> <p>A rotary mechanism moves an object in a curved way.</p> <p>Wheels need to be round to rotate and move.</p> <p>For a wheel to move it must be attached to a rotating axle.</p> <p>An axle moves within an axle holder which is fixed to the vehicle or toy.</p>	<p>Air can be used to create mechanisms and these are called pneumatic systems.</p> <p>A pneumatic system can force air across a distance to make a mechanism work.</p> <p>A cam turns a turning motion into a linear motion.</p> <p>Different shape cams create different movements.</p> <p>Inputs are motions that start mechanisms and outputs are the resultant motions.</p>	<p>Inputs are motions that start mechanisms and outputs are the resultant motions.</p> <p>Different mechanisms control movement in different ways.</p> <p>Rotary motion is a circular path in one direction</p> <p>Reciprocating motion is back and forwards in a straight line.</p> <p>Oscillating motion is in a circular path, first one way then the other.</p> <p>Electric circuits can be incorporated into products.</p>



Substantive Knowledge. <i>Pupils should know that:</i>				
	Year R	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Structures	Structures need to be strong.	Structures need to be strong and stable. Roofs need to be waterproof. Windows need to be transparent. Structures with a wide base are stable. Cylinders and corrugated shapes make strong structures. Hinges allow parts of a structure to open and close.	Sheets within structures can be strengthened by folding and shaping, corrugating, ribbing and laminating. Structures with a square or rectangular base are strong and stable. Structures with diagonal struts are strong and stable. Pavilions are a type of temporary or permanent enclosure.	There are beam, arch and truss bridges. Arches increase the strength of bridges. Truss bridges use triangles to strengthen beams.



Disciplinary Knowledge <i>Pupils should know how to:</i>				
	Year R	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Practical skills and techniques	Use a small range of materials such as textiles and food ingredients.	Use a small range of materials and components, such as construction kits, textiles, food ingredients and mechanical components.	Begin to use a wider range of materials and components than KS1, such as construction materials and kits, textiles, wood, food ingredients, mechanical and electric components.	Use a wide range of materials and components, such as construction materials and kits, textiles, wood, food ingredients, mechanical and electric components.
Mechanical and Electrical Systems	<p>Cut and shape materials</p> <p>With support, assemble, join and combine materials using a range of methods – e.g. masking tape, glue, staples</p>	<p>Assemble, join and combine materials to make simple mechanisms using masking tape, glue and split pins.</p> <p>Assemble, join and combine materials/ to make simple wheels and axles and pulleys.</p>	<p>Assemble, join and combine materials and components to make simple pneumatic systems.</p> <p>Assemble, join and combine materials and components to make simple cam mechanisms.</p>	<p>Assemble, join and combine materials and components to make a range of different mechanisms.</p> <p>Use layers and spacers to hide mechanisms.</p> <p>Incorporate a circuit into a product base.</p>
Textiles	With support, decorate fabrics with attached items - e.g. buttons, beads, sequins, braids, ribbons.	<p>Measure, mark out, cut and shape materials/components, including cutting fabric from a template.</p> <p>Assemble, join and combine materials and component using a range of methods – e.g. masking tape, glue, staples, running stitch.</p> <p>With support, decorate fabrics with attached items - e.g. buttons, beads, sequins, braids, ribbons.</p>	<p>Measure, mark out, cut, shape and score materials/components with some accuracy.</p> <p>Assemble, join and combine materials and components with some accuracy, using a range of methods - e.g. masking tape, glue, staples, running stitch, cross-stitch, applique.</p> <p>Sew on buttons and make loops.</p>	<p>Measure, mark out, cut, shape and score materials and components to the nearest 1mm.</p> <p>Accurately assemble, join and combine materials and components, using a range of methods - e.g. masking tape, glue, staples, running stitch, back stitch, blanket stitch, applique glue gun and modelling wire.</p> <p>Decorate textiles appropriately (often before joining components).</p>
Structures	Explore how to make structures stronger.	<p>Assemble, join and combine materials to make strong and stable structures.</p> <p>Assemble, join and combine materials to make simple hinges .</p>	<p>Assemble, join & combine paper to strengthen structures – e.g. folding and shaping, corrugating, ribbing, laminating.</p> <p>Join structural beams to create strong and stable structures.</p> <p>Add diagonal struts to increase stability.</p> <p>Create a free-standing structure.</p> <p>Create different textured cladding effects.</p>	<p>Assemble, join & combine paper to strengthen bridges – e.g. folding and shaping, corrugating, ribbing, laminating, arching.</p> <p>Strengthen bridges with triangular trusses.</p> <p>Measure, mark out and cut wood safely using a tenon saw.</p>



Disciplinary Knowledge <i>Pupils should know how to:</i>				
	Year R	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
COOKING AND NUTRITION	<p>Begin to understand how to prepare simple dishes, without a heat source.</p> <p>Begin to develop food vocabulary using taste, smell, texture and feel.</p>	<p>With support, know how to prepare simple dishes safely and hygienically, without using a heat source.</p> <p>Taste test food combinations.</p> <p>Develop food vocabulary using taste, smell, texture and feel.</p>	<p>Begin to know how to prepare and cook safely and hygienically including, where appropriate, the use of a heat source.</p> <p>Develop sensory vocabulary/knowledge using, smell, taste, texture and feel.</p>	<p>Know how to prepare and cook and hygienically including, where appropriate, the use of a heat source.</p> <p>Develop sensory vocabulary/knowledge using, smell, taste, texture and feel</p>
MIX/STIR	<p>Loosely combine ingredients.</p> <p>Mash ingredients together using a fork.</p>	<p>Combine ingredients with increasing thoroughness.</p>	<p>Combine any ingredients thoroughly.</p> <p>Whisk foods using a hand whisk.</p>	<p>Fold ingredients together carefully.</p> <p>Whisk foods using a hand whisk.</p>
SPOON	<p>Spoon ingredients between containers.</p>	<p>Spoon ingredients into different containers with increasing accuracy and minimal spillage.</p>	<p>Use two spoons to transfer ingredients into different size/shape containers with minimal spillage - e.g. liquid foods into baking cases.</p>	<p>Gauge the quantities spooned to ensure an equal amount of ingredient in each container.</p>
MEASURE	<p>Begin to measure and weigh food items, using non-standard measures e.g. spoons, cups. Count ingredients.</p>	<p>Measure and weigh food items, using non-standard measures e.g. spoons, cups, and standard measures, in accordance with the KS1 NC for Maths.</p>	<p>Weigh and measure using scales and standard measures, in accordance with the Year 3/4 NC for Maths – e.g. measuring jugs and digital scales.</p>	<p>Weigh and measure using scales with increasing accuracy, in accordance with the Year 5/6 NC for Maths – e.g. – e.g. measuring jugs and digital/analogue scales.</p>
GRATING		<p>Grate soft foods - e.g. cheese, cucumber.</p>	<p>Grate firmer foods - e.g. carrots, apples.</p>	<p>Grate independently, and use the other parts of a grater (e.g. zesting) as needed.</p>
TEARING AND SNIPPING	<p>Tear fresh herbs</p>	<p>Snip fresh herbs or spring onion.</p>	<p>Tear and shred with greater dexterity – e.g. shredding lettuce.</p>	<p>Tear and shred with greater dexterity – e.g. shredding lettuce.</p>
THREADING		<p>Thread soft foods onto kebab sticks or cocktail sticks - e.g. soft fruits.</p>	<p>Thread medium-resistance foods onto kebab sticks -e.g. courgettes.</p>	<p>Thread high-resistance foods onto kebab sticks – e.g. onions, peppers.</p>
CUTTING	<p>Cut soft foods with butter knife, e.g. banana, canned peach slices.</p>	<p>Cut low resistance foods with a table knife into equal size pieces/slices - e.g. canned pineapple slices, sticks of pepper, mushrooms.</p> <p>Use a fork to secure foods.</p>	<p>Cut medium resistance foods with a vegetable knife - e.g. cucumber.</p> <p>Use a fork or the claw grip to secure foods.</p> <p>Cut medium resistance or partly prepared foods using a bridge hold - e.g. cut half a tomato into a quarter, halve canned potatoes, halve large grapes.</p>	<p>Cut higher resistance foods with a vegetable knife, using the claw grip - e.g. celery, carrots.</p> <p>Cut higher resistant foods from whole using the bridge hold - e.g. halve an apple, raw potato.</p>
FOLLOWING	<p>Follow simple instructions given by an adult.</p>	<p>Follow a simple recipe supported by an adult.</p>	<p>Follow a simple recipe with guidance from an adult and adapt it as needed</p>	<p>Follow and modify a simple recipe independently.</p>



Procedural Knowledge: <i>Pupils should know how to...</i>				
	Year R	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Understanding contexts, users and purposes	<p>Work within a small range of familiar contexts, such as imaginary, story-based, home, school, gardens, playgrounds and the local community.</p> <p>Begin to state what products they're designing & making, who they are for, how they work,.</p>	<p>Work within a small range of familiar contexts, such as imaginary, story-based, home, school, gardens, playgrounds and the local community.</p> <p>State what products they are designing and making, who they are for, how they work, and how they will make them suitable.</p> <p>Develop design criteria with support.</p>	<p>Work within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment.</p> <p>Begin to describe the purpose of their products and their design features, explaining how particular parts of their products work.</p> <p>Begin to gather information about the needs/ wants of individuals and groups, and develop their own design criteria.</p>	<p>Work confidently and independently within a broad range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment.</p> <p>Describe the purpose of their products and their design features, explaining in detail how particular parts of their products work.</p> <p>Gather information about the needs and wants of particular individuals and groups, develop their own design criteria and use these to inform their ideas.</p>
INVESTIGATING: existing products	<p>Explore:</p> <ul style="list-style-type: none"> •what products are •who/what products are for •how products work •where products are used •what materials are used •what they like and dislike about products 	<p>Explore:</p> <ul style="list-style-type: none"> •what products are •who products are for •what products are for •how products work •where products are used •what materials products are made from •what they like and dislike about products 	<p>Begin to investigate and analyse:</p> <ul style="list-style-type: none"> •how well products have been designed and made •why materials have been chosen •how well products work and achieve their purposes •how well products meet user needs and wants •who designed and made the products •whether products can be recycled or reused •inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products 	<p>Investigate and analyse:</p> <ul style="list-style-type: none"> •how well products have been designed and made •why materials have been chosen •how well products work and achieve their purposes •how well products meet user needs and wants •who designed and made the products •how much products cost to make •how innovative products are •how sustainable the materials in products are •what impact products have beyond intended purpose •inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
DESIGNING: Generating, developing, modelling and communicating ideas	<p>Explore simple ideas.</p> <p>Develop and communicate ideas by talking and drawing.</p> <p>Begin to model ideas by exploring materials.</p>	<p>Generate ideas by drawing on their own experiences and knowledge of existing products.</p> <p>Develop and communicate ideas by talking and drawing, including labelling parts.</p> <p>Model ideas by exploring materials, components & construction kits.</p> <p>With support, use ICT to develop and communicate ideas.</p>	<p>Generate realistic ideas, focusing on the needs of the user.</p> <p>Begin to share and clarify ideas through discussion, and use annotated sketches and labelled drawings from different viewpoints to develop and communicate their ideas.</p> <p>Begin to model their ideas using prototypes.</p> <p>Use information and communication technology, where appropriate, to develop and communicate their ideas.</p>	<p>Generate realistic ideas, focusing on the needs of the user and drawing on research.</p> <p>Share and clarify ideas through discussion. Use annotated sketches, cross-sectional and perspective drawings and exploded diagrams to develop and communicate their ideas.</p> <p>Model their ideas using prototypes.</p> <p>Use CAD to develop and communicate their ideas.</p>
DESIGNING: Planning	<p>Select from a range of tools, equipment and materials.</p>	<p>Select from a range of tools and equipment.</p> <p>Select from a range of materials and components according to their characteristics.</p>	<p>Select tools and equipment suitable for the task.</p> <p>Select materials and components suitable for the task.</p> <p>Plan and order the stages of making.</p>	<p>Select tools and equipment suitable for the task, explaining their choice in relation to the skills/techniques used.</p> <p>Select suitable materials/components. explaining choices according to functional and aesthetic qualities.</p> <p>Produce appropriate lists of tools, equipment and materials that they need and formulate step-by-step plans.</p>
MAKING	<p>Make a simple product with support.</p>	<p>Follow procedures for safety and hygiene.</p> <p>Follow a simple plan to make a product, following design criteria with support.</p>	<p>Follow procedures for safety and hygiene.</p> <p>Follow design criteria to create a product.</p>	<p>Follow procedures for safety and hygiene.</p> <p>Follow design criteria to create a product.</p>
EVALUATING: own products		<p>Evaluate a finished product against design criteria, explaining likes and dislikes.</p>	<p>Evaluate an end product against own design criteria, consider the views of others, and think of ways to improve the design.</p> <p>Evaluate their ideas and products against their original design specification, and begin to think about the needs of the user.</p>	<p>Reflect on their work continually throughout the design, make and evaluate.</p> <p>Evaluate their ideas and products against their original design specification, thinking about the needs of the user.</p>



3 Design and Technology Topics Per Year...

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Topic 1	Homes (Structures)	Winding Up Toys (Mechanical Systems) [change road map]	Packaging (Structures)	Pavilions (Structures)	Recycled Fashion (Textiles)	Bridges (Structures)
Topic 2	Moving Pictures (Mechanical Systems)	Puppets (Textiles)	Cushions (Textiles)	Adapting a recipe (Cooking and nutrition)	Pop Up Book (Mechanical)	Steady Hand Game (Electrical)
Topic 3	Fruit and Vegetables (Cooking and Nutrition)	Food: A Balanced Diet (Cooking and Nutrition)	Moving Monsters (Mechanical Systems)	Moving Toys (Mechanical/Electrical)	Healthy Meals (Cooking and Nutrition)	Fairgrounds (Mechanical/electrical)