

## Design Technology Curriculum Progression

Purpose: Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that **solve real and relevant problems** within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take **risks, becoming resourceful, innovative, enterprising and capable citizens**. Through the evaluation of past and present design and technology, they develop a **critical understanding of its impact on daily life** and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

How learning starts in the early years	A combination of child initiated and adult directed activities give pupils the opportunities to learn to: <ul style="list-style-type: none"> <li>• Use what they have learnt about media and materials to design and make models with a <b>function or purpose</b></li> <li>• Make <b>designs</b> and plans and construct with bricks, construction kits, malleable materials and loose parts</li> <li>• Use hammers, saws and drills effectively and safely.</li> <li>• Select appropriate resources for a product and adapt and <b>innovate</b> their work by making <b>decisions</b></li> <li>• Chop, peel and slice fruit</li> <li>• Adhere to and understand the need for good health and hygiene routines</li> </ul>					
Opportunities	<b>KS1</b>		<b>KS2</b>			
	<b>Year 1</b>	<b>Year 2</b>	<b>Year3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<b>Suggested Breadth of Study</b> ( Topics in red are essential for progress)	<b>Flying Kites</b>  <b>Teddy Bears Picnic</b> ( preparing fruits and vegetables)	<b>Making Fire Engines ( wheels and axles)</b>  <b>Healthy Eating- healthy lunchbox</b>  <b>Puppets ( templates and joining techniques)</b>	<b>Moving Monsters</b>  <b>Sandwich Snacks</b>  <b>Mini Greenhouses</b>	<b>Alarms</b>  <b>Musical Instruments</b>  <b>Storybooks</b>	<b>Moving Toys</b>  <b>Making Bread</b>  <b>Seasonal Food</b>	<b>Programming Pioneers</b>  <b>Structures</b>  <b>Textiles</b>

## Design Technology Curriculum Progression



<b>Design, make, evaluate and improve</b> <b>sub-schema:</b> <b>user,</b> <b>purpose,</b> <b>innovation,</b> <b>design decisions,</b> <b>authenticity</b> <b>functionality</b>	Design products that have a definite function for a particular person	Design and make products, modifying the product as the project evolves Bird house model	Produce designs with a clear purpose having explored needs, food packaging	Refine methods and design as work progresses, constantly reassessing design.	Design by considering the user, prioritising good function before profit.	Produce a good quality finish to products using art techniques
	Make products to meet basic design brief		Select materials carefully to suit the design and use.	Use computer packages to design and model products.	Produce several prototypes each building upon the previous to optimise design	Include designing processes such as prototypes, cross-sectional diagrams and CAD
<b>Computer aided design</b>	Model designs using software.		Control and monitor models using software designed for this purpose.		Write code to control and monitor models or products.	
<b>Practical techniques</b>	practice techniques to join and/or strengthen materials eg , gluing and reinforcing card	explore and use mechanisms in their products , wheels and axles	Select appropriate techniques to construct products	Construct series and parallel circuits  Apply understanding of forces to select a suitable mechanism e.g. levers, winding mechanism, pulleys and gears.	Create circuits using electronics kits that combine a number of parts (e.g. LEDs, resistors, chips etc.)  Practice practical skills to a reasonable standard to produce products	Combine electronics and mechanics to produce original designs  Use cams to change a rotation into a push/pull movement
<b>Technical knowledge</b>	Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products. Create products using levers, wheels and winding mechanisms.		Choose suitable techniques to construct products or to repair items.  Strengthen materials using suitable techniques. Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).		Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).  Convert rotary motion to linear using cams.  Use innovative combinations of electronics (or computing) and mechanics in product designs	

## Design Technology Curriculum Progression



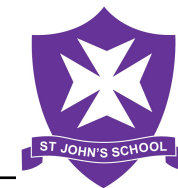
<b>Electronics</b>	Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).		Create series and parallel circuits		Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).	
<b>Cooking and nutrition</b>	Select from and use ingredients according to their characteristics (Healthy sandwich/skewer)	<p>Safely cut, peel or grate ingredients in a hygienic manner (fruit salad)</p> <p>Use measuring cups or electronic scales to measure the required amounts</p> <p>Combine ingredients to produce food.</p>	<p>Use correct utensils to hygienically prepare food</p> <p>Combine and or cook</p> <p>Seasonal and savoury foods</p>	<p>Use correct utensils to hygienically prepare food</p> <p>Combine and or cook</p> <p>Seasonal and savoury foods</p>	<p>Understand how to store and handle food ingredients properly.</p> <p>Invent and modify own recipes including savoury ingredients, methods, cooking times and temperatures</p> <p>Seasonal and savoury foods</p>	<p>Understand how to store and handle food ingredients properly.</p> <p>Invent and modify own recipes including ingredients, methods, cooking times and temperatures</p> <p>Seasonal and savoury foods</p>
<b>Materials and Textiles</b>	<p>Use a running stitch to join fabric</p> <p>Use methods such as dyeing, adding sequins or printing alter the appearance of fabric</p> <p>Make use of template to produce shapes</p>	<p>Demonstrate safe use of a given tool.</p> <p>Perform a range of cutting and shaping techniques e.g. tearing, cutting, folding and curling</p> <p>Use a range of joining techniques e.g. gluing, hinges or combining materials to strengthen</p>	<p>Use correct stitch to join materials felt stocking or angel deco</p> <p>Add decorative finish using a suitable technique</p>	<p>Use suitable cutting and shaping techniques</p> <p>Choose suitable joining techniques</p>	<p>Use a variety of stitching techniques to join fabrics.</p> <p>understand the purpose of and include a seam allowance</p>	<p>Cut with precision and produce a good finish</p> <p>Select appropriate tools to cut and shape a particular type of material</p>
<b>Sticky Knowledge</b>	Slicing vegetables with a serrated, round ended knife	Measuring the required length of dowel with non-standard or	Understand and use pneumatic mechanisms  mark out, hold, cut and join materials and components correctly.	Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers	Understand how cams can be used to produce different types of movement and change the direction of movement	<p>Know how to strengthen, stiffen and reinforce existing fabrics.</p> <p>Understand how to</p>

## Design Technology Curriculum Progression



	<p>Making holes using an appropriate hole punch</p> <p>Choosing, folding and cutting paper and card</p> <p>Saying what material or component they need to collect first</p> <p>Saying which practical skill or technique (e.g. sawing or gluing) will be used</p> <p>Know how to make kite lightweight, strong and durable</p> <p>Add to a frame to make the shape of kite and the joins stronger</p>	<p>standard units and marking out before cutting</p> <p>Using a junior hacksaw to cut dowel</p> <p>Fixing using a glue gun.</p> <p>Distinguish between fixed and freely moving axles.</p> <p>Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.</p> <p>Making a template and using it to mark out a piece of fabric</p> <p>How simple 3-D textile products are made, using a template to create two identical shapes.</p> <p>Joining fabrics using different techniques e.g. running stitch, glue, over stitch, stapling, different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.</p>	<p>Understand how to strengthen, stiffen and reinforce 3-D frameworks.</p> <p>Know how to use appropriate equipment and utensils to prepare and combine food.</p> <p>Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.</p>	<p>Know how to use appropriate equipment and utensils to prepare and combine food.</p> <p>Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.</p> <p>mark out, hold, cut and join materials and components correctly.</p> <p>Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.</p> <p>Understand and use lever and linkage mecha</p> <p>Distinguish between fixed and loose pivots.</p>	<p>Know how to use utensils and equipment including heat sources to prepare and cook food.</p> <p>Understand about seasonality in relation to food products and the source of different food products.</p>	<p>securely join two pieces of fabric together.</p> <p>Understand the need for patterns and seam allowances.</p> <p>Understand and use computing to program and control products containing electrical systems, such as series circuits incorporating switches, bulbs and buzzers.</p>
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## Design Technology Curriculum Progression



<b>Threshold Concepts</b>	<b>Master practical knowledge and skills</b> <b>Design, make evaluate and improve</b> (sub-schema: user, purpose innovation, design decisions, authenticity functionality) <b>Take inspiration from design throughout history</b>	<b>Master practical knowledge and skills</b> <b>Design, make evaluate and improve</b> (sub-schema: user, purpose innovation, design decisions, authenticity functionality) <b>Take inspiration from design throughout history</b>	<b>Master practical knowledge and skills</b> <b>Design, make evaluate and improve</b> (sub-schema: user, purpose innovation, design decisions, authenticity functionality) <b>Take inspiration from design throughout history</b>	<b>Master practical knowledge and skills</b> <b>Design, make evaluate and improve</b> (sub-schema: user, purpose innovation, design decisions, authenticity functionality) <b>Take inspiration from design throughout history</b>	<b>Master practical knowledge and skills</b> <b>Design, make evaluate and improve</b> (sub-schema: user, purpose innovation, design decisions, authenticity functionality) <b>Take inspiration from design throughout history</b>	<b>Master practical knowledge and skills</b> <b>Design, make evaluate and improve</b> (sub-schema: user, purpose innovation, design decisions, authenticity functionality) <b>Take inspiration from design throughout history</b>

## Design Technology Curriculum Progression



<b>Milestones for assessment</b>	<b>Milestone 1:</b>  Cut, peel or grate ingredients safely and hygienically.  Measure or weigh using measuring cups or electronic scales.  Assemble or cook ingredients.  Cut materials safely using tools provided.  Measure and mark out to the nearest centimetre.  Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).  Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).  Shape textiles using templates.  Join textiles using running stitch.  Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing)  Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage)	<b>Milestone 2:</b>  Prepare ingredients hygienically using appropriate utensils.  Measure ingredients to the nearest gram accurately.  Follow a recipe.  Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).  Cut materials accurately and safely by selecting appropriate tools.  Measure and mark out to the nearest millimetre.  Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).  Select appropriate joining techniques.  Understand the need for a seam allowance.  Join textiles with appropriate stitching.  Select the most appropriate techniques to decorate textile  Create series and parallel circuits	<b>Milestone 3:</b>  Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms).  Measure accurately and calculate ratios of ingredients to scale up or down from a recipe.  Demonstrate a range of baking and cooking techniques.  Create and refine recipes, including ingredients, methods, cooking times and temperatures.  Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).  Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).  Create objects (such as a cushion) that employ a seam allowance  Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration).
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## Design Technology Curriculum Progression



	<p>Model designs using software</p> <p>Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products</p> <p>Create products using levers, wheels and winding mechanisms.</p> <p>Design products that have a clear purpose and an intended user.</p> <p>Make products, refining the design as work progresses.</p> <p>Use software to design</p> <p>Explore objects and designs to identify likes and dislikes of the designs.</p> <p>Suggest improvements to existing designs.</p> <p>Explore how products have been created.</p>	<p>Control and monitor models using software designed for this purpose</p> <p>Choose suitable techniques to construct products or to repair items.</p> <p>Strengthen materials using suitable techniques.</p> <p>Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears)</p> <p>Design with purpose by identifying opportunities to design.</p> <p>Make products by working efficiently (such as by selecting materials).</p> <p>Refine work and techniques as work progresses, continually evaluating the product design.</p> <p>Use software to design and represent product designs.</p> <p>Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.</p> <p>Improve upon existing designs, giving reasons for choices.</p>	<p>Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion).</p> <p>Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips)</p> <p>Write code to control and monitor models or products.</p> <p>Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).</p> <p>Convert rotary motion to linear using cams.</p> <p>Use innovative combinations of electronics (or computing) and mechanics in product designs.</p> <p>Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).</p> <p>Make products through stages of prototypes, making continual refinements.</p> <p>Ensure products have a high quality finish, using art skills where appropriate.</p> <p>Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.</p>
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## Design Technology Curriculum Progression



		Disassemble products to understand how they work.	<p>Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.</p> <p>Create innovative designs that improve upon existing products.</p> <p>Evaluate the design of products so as to suggest improvements to the user experience</p>
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<b>POP tasks</b>	<b>Kites:</b> Evaluate their kite design. What was the easiest/ hardest part, how well does the kite fly, what would they change?  Create a healthy skewer for a <b>Teddy Bear's Picnic</b>	<b>Puppets:</b> Shape, stitch and join puppet template  <b>Fire engines:</b> Design, make and evaluate wheels, axles and chassis for fire engine designs  <b>Healthy Packed lunches-</b> assemble and evaluate ingredients	<b>Moving Monsters:</b> construct an effective pneumatic system to control movement, evaluate design  <b>Mini Greenhouses:</b> apply their knowledge of stable structures and suitable materials when designing a mini greenhouse  <b>Sandwich snacks</b> Design make and evaluate sandwiches	<b>Alarms:</b> design an alarm system that is suitable for a particular purpose apply what they have learnt about alarms, circuits and switches when designing their own alarm systems  <b>Musical Instruments:</b> Use existing examples of percussion instruments to draw inspiration. Follow their designs to make a functional instrument.  <b>Story books:</b> Design and make a story book with moving parts	<b>Moving Toys</b> Design a moving toy with a cam mechanism Describe how they will create their toy and what materials and tools they will need?  <b>Bread:</b> Design and bake a new bread product for a particular person or event.  <b>Seasonal Foods:</b> Prepare a healthy, savoury seasonal meal	<b>Fashion and Textiles:</b> Use pattern pieces to mark fabric for cutting and sewing. Add details to a product according to their own design. Use whip stitch, straight and back stitch.  <b>Programming Pioneers</b> Begin to explain how embedded systems monitor and control products Explain how computer Scientists have helped shape the world?  <b>Structures:</b> Design and evaluate an earthquake resistant building