

# St John & St James' C of E Primary School

## Design and Technology Progression Map



	Autumn 2	Spring 2	Summer 2
	<p><b>Science unit: Everyday Materials</b> To build a bridge – Structures (freestanding)</p> 	<p><b>Science unit: Animals including humans (parts of body &amp; senses)</b> To make a fruit salad – Cooking and Nutrition</p> 	<p><b>Science unit: Animals including humans (classification of animals)</b> To use levers and sliders – Mechanisms</p> 
Y e a r 1	<p><b>Researching</b> Draw on their own experience to help generate ideas. Research existing structures.</p> <p><b>Designing</b> Generate ideas based on simple design criteria, explaining what they could make</p> <p><b>Making</b> Plan by suggesting what to do next Select tools, skills and techniques Select new and reclaimed materials to build their structure Use simple finishing techniques suitable for the product</p> <p><b>Evaluating</b> Explore a range of freestanding structures in the school and local environment Discuss how it works in relation to the purpose, the user and the design criteria</p> <p><b>Technical knowledge</b> Understand how to make freestanding structures stronger, stiffer and more stable Use technical vocabulary related to project</p> <p><u>Key vocabulary</u> cut, fold, join, fix, structure, framework, weak, strong, thinner, thicker</p>	<p><b>Researching</b> Research fruit and vegetables in terms of the five senses Generate ideas by drawing on their own experiences.</p> <p><b>Designing</b> Use basic principle of a healthy diet to prepare dish</p> <p><b>Making</b> Cut and peel ingredients safely and hygienically Measure or weigh using scales Assemble ingredients Prepare simple dishes safely and hygienically, without using a heat source</p> <p><b>Evaluating</b> Evaluate fruits salad in relation to the 5 senses</p> <p><b>Food and nutritional knowledge</b> That everyone should eat at least five portions of fruit and vegetables every day</p> <p><u>Key vocabulary</u> fruit Flesh texture ingredient juicy sweet peeler knife slice hygiene</p>	<p><b>Researching</b> Use simple design criteria to help develop their ideas. Use knowledge of existing products to help come up with ideas.</p> <p><b>Designing</b> Develop and communicate ideas by talking and drawing Select from a range of tools and equipment. Plan by suggesting what to do next.</p> <p><b>Making</b> Plan by suggesting what to do next. Select and use tools, explaining their choices, to cut, shape and join paper and card Use simple finishing techniques suitable for the product they are creating</p> <p><b>Evaluating</b> Explore a range of existing books and everyday products that use simple sliders and levers Evaluate their product by discussing how well it works in relation to the purpose and the user and if it meets the design criteria.</p> <p><b>Technical knowledge</b> Explore sliders and levers Understand that different mechanisms produce different types of movement Know and use technical vocabulary relevant to the project. <u>Key vocabulary</u> slider lever pivot slot guide push up pull</p>

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	<p><b>Science unit: Use of everyday materials</b>  <b>To produce a Christmas stocking (textiles)</b></p> 	<p><b>Science unit: Animals including humans</b>  <b>To make a pizza - Cooking and Nutrition</b></p> 	<p><b>Down curve straight</b>  <b>Science unit: Use of everyday materials</b>  <b>To use wheels and axels - Mechanisms</b></p> 
<p><b>Y</b> <b>e</b> <b>a</b> <b>r</b> <b>2</b></p>	<p><b>Researching</b>            Say whether their products are for themselves or other users            Describe what their products are for</p> <p><b>Designing</b>            Design a functional and appealing product for a chosen user based on a design criteria            Generate, develop, model and communicate ideas though discussion, templates and mock-ups</p> <p><b>Making</b>            Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing</p> <p><b>Evaluating</b>            Explore and evaluate a range of existing textile products            Evaluate ideas throughout and their final products against the design criteria</p> <p><b>Technical knowledge</b>            Understand how simple 3D textile products are made, using a template to create two identical shapes.            Join fabrics using different techniques, eg running stich, glue, stapling            Explore different finishing techniques</p> <p><u>Key vocabulary</u> tools, fabric, components, template, mark out, join, mock-up, decorate</p>	<p><b>Researching</b>            Research existing products.</p> <p><b>Designing</b>            Communicate their ideas, saying what they like and dislike about them.            Make a labelled diagram of their product.</p> <p><b>Making</b>            Cut, peel and grate ingredients safely and hygienically.            Measure or weigh using scales and cups.            Assemble and cook ingredients.</p> <p><b>Evaluating</b>            Evaluate their products as they are developed,            Identify strengths and possible changes they might make.</p> <p><b>Food and nutritional knowledge</b>            Understand where food comes from.</p> <p><u>Key vocabulary</u> Taste Texture Cut Grate Chop peeler knife slice hygiene</p>	<p><b>Researching</b>            Use knowledge of existing products to help come up with ideas            Say how they will make their products suitable for their intended users</p> <p><b>Designing</b>            Generate initial ideas and simple design criteria through talking and using own experiences            Develop and communicate ideas through drawings and mock-ups.</p> <p><b>Making</b>            Select from and use a range of tools and equipment to perform practical tasks (cutting and joining) to allow movement            Select from and use a range of materials and components (card, plastic, wood)</p> <p><b>Evaluating</b>            Explore and evaluate a range of products with wheels and axels            Evaluate ideas throughout and products against design criteria</p> <p><b>Technical knowledge</b>            Explore wheels, axles and axle holders            Distinguish between fixed and freely moving axles            Use technical vocabulary relevant to product design.</p> <p><u>Key vocabulary</u> Vehicle, wheel, axel, axel holder, chassis, body, cab, assembling, moving, mechanism</p>

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<b>Y e a r 3</b>	<p><b>Science unit: Forces</b> To create a gift box (Shell Structures)</p> 	<p><b>Science unit: Animals including humans</b> To make a sandwich snack (Cooking and Nutrition)</p> 	<p><b>Science unit: Forces</b> To create a moving creature (Mechanisms)</p> 
	<p><b>Researching</b> Generate ideas based on existing products Identify a purpose and establish criteria for a successful product Evaluate existing products to determine most effective design</p> <p><b>Designing</b> Generate realistic ideas and design criteria focusing on the needs of the user and the product Develop ideas through the analysis of existing products and its purpose Order the stages of making</p> <p><b>Making</b> Select and use the appropriate tools to measure, mark out, cut, score, shape and assemble with accuracy</p> <p><b>Evaluating</b> Investigate and evaluate shell structures Test own products against design criteria and purpose for the user</p> <p><b>Technical knowledge</b> Develop and use knowledge of how to construct strong, stiff shell structures. Use knowledge of nets of cubes and cuboids</p> <p><u>Key vocabulary</u> shell structure, three- dimensional, shape, net, cube, cuboid, marking out, assemble, material, prototype</p>	<p><b>Researching</b> Research existing products.</p> <p><b>Designing</b> Improve on existing designs giving reasons for choices. Identify tools needed Write a simple recipe</p> <p><b>Making</b> Prepare ingredients hygienically. Measures ingredients accurately. Cook ingredients controlling the temperature of the hob or oven.</p> <p><b>Evaluating</b> Use their design criteria to evaluate their completed products.</p> <p><b>Food and nutritional knowledge</b> Understand the seasonality of fruit and vegetables</p> <p><u>Key vocabulary</u> Appearance Texture Ingredients Food groups Sweet Sour Bitter Spread</p>	<p><b>Researching</b> Explore simple mechanisms, such as sliders and leavers, investigate familiar objects that use air to make them work Research existing products. Discuss purpose of the products they are designing</p> <p><b>Designing</b> Using annotated sketches and prototypes, develop, model and communicate ideas Generate realistic and appropriate ideas and design criteria through discussion Order the main stages of making</p> <p><b>Making</b> Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons</p> <p><b>Evaluating</b> Evaluate their product against original design criteria</p> <p><b>Technical knowledge</b> Understand and use pneumatic mechanisms</p> <p><u>Key vocabulary</u> components, fixing, attaching, tubing, split pin, plunger, input movement, output movement, linear, rotary, oscillating</p>

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## Design and Technology Progression Map



Year 4	<b>Science unit: Electricity</b> <b>To create an electronic game (Electric and digital)</b> 	<b>Science unit: States of Matter</b> <b>To make bread ( Cooking and Nutrition )</b> 	<b>Science unit: Living things and their habitats</b> <b>To make a pencil case (textiles)</b> 
	<p><b>Researching</b>            Generate ideas based on existing products            Identify a purpose and establish criteria for a successful product            Investigate and analyse a range of existing battery- powered products</p> <p><b>Designing</b>            Disassemble product to understand how they work            Plan the order of their work before starting            Explore, develop and communicate design proposals by modelling ideas            Make drawings with labels when designing            Order the main stages of making</p> <p><b>Making</b>            Measure, mark out, cut, score and assemble components with more accuracy            Be willing change things if this helps them improve their work            Select from and use materials and components according to their functional properties and aesthetic qualities</p> <p><b>Evaluating</b>            Use their design criteria to evaluate their completed products.            Identify the strengths and areas for development in their ideas and products.</p> <p><b>Technical knowledge</b>            Understand and use electrical systems in their products such as series circuits incorporating switches, bulbs and buzzers</p> <p><u>Key vocabulary</u> series circuit, fault, connection, switch, battery, bulb, wire ,insulator, conductor</p>	<p><b>Researching</b>            Investigate similar products to the one to be made to give starting points for a design.</p> <p><b>Designing</b>            Identify tools needed            Write a simple recipe            Draw/sketch products to help analyse and understand how products are made.</p> <p><b>Making</b>            Prepare bread using the ‘kneading’ technique.            Measure ingredients to the nearest gram accurate.            Assemble and cook ingredients controlling the temperature of the oven or hob.            Refine working techniques as the work progresses.</p> <p><b>Evaluating</b>            Use their design criteria to evaluate their completed products.</p> <p><b>Food and nutritional knowledge</b>            Understand the principals of a healthy and varied diet.</p> <p><u>Key Vocabulary</u> Yeast Dough Savoury Knead Stir Combine Crumble Fold Gluten Nutrition</p>	<p><b>Researching</b>            Develop their own design criteria and use these to inform their ideas            Generate realistic ideas through discussion</p> <p><b>Designing</b>            Order the main stages of making explaining the choice of equipment and materials.            Produce annotated sketches, prototypes, final product sketches</p> <p><b>Making</b>            Measure, mark out, cut and shape materials and components with some accuracy            Refer to their design criteria as they design and make            Select fabrics and fastenings according to their functional characteristics</p> <p><b>Evaluating</b>            Use their design criteria to evaluate their completed products            Test their product with the user in mind</p> <p><b>Technical knowledge</b>            Know how to strengthen, stiffen and reinforce existing fabrics            Understand how to securely join two pieces of fabric together            Understand the need for a seam allowance  <u>Key vocabulary</u> fabric, fastening, compartment, zip, button, structure, strength, templates, stitches, seam</p>

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## Design and Technology Progression Map



Year 5	<b>Science unit: Living things and their habitats</b> <b>To make a moving animal (Mechanisms CAMS)</b> 	<b>Science unit: Properties and changes</b> <b>To make biscuits (Cooking and Nutrition )</b> 	<b>Science unit: Space</b> <b>To create a tent (Frame Structures)</b> 
	<p><b>Researching</b> Examine existing products and generate ideas through brainstorming and identify a purpose for their product. Create a design criteria</p> <p><b>Designing</b> Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail. Select appropriate materials, tools and techniques.</p> <p><b>Making</b> Use skills in using different tools and equipment safely and accurately. Cut and join with accuracy to ensure a good-quality product. Ensure products have a high quality finish using art skills where appropriate Work within the constraints of time, resources and cost</p> <p><b>Evaluating</b> Evaluate a product against the original design specification. Evaluate it personally and seek evaluation from others. Test products with the intended user in mind</p> <p><b>Technical knowledge</b> Understand that mechanical systems have an input, process and output Understand how CAMS can be used to produce different types of movement and change the direction of movement</p> <p><u>Key Vocabulary</u> cam follower axel shaft crank handle framework rotation motion mechanical system input output process</p>	<p><b>Researching</b> Carry out research, using surveys, interviews, questionnaires and web-based resources</p> <p><b>Designing</b> Write a recipe with detailed steps including tools to be used. Calculate ratio of ingredients to scale up or down from a recipe.</p> <p><b>Making</b> Prepare a sweet treat using a range of cooking techniques. Refine recipes including ingredients, methods, cooking times and temperatures. Demonstrate a range of baking and cooking techniques.</p> <p><b>Evaluating</b> Critically evaluate the design of the product and suggest improvements for the user.</p> <p><b>Food and nutritional knowledge</b> Understand the correct handling and storage of ingredients.</p> <p><u>Key Vocabulary</u> Mixing Pouring Weighing Ingredients Greasy Moist Fresh Rubbing in Seasonal Combining</p>	<p><b>Researching</b> Generate innovative ideas, drawing on research. Explore a range of portable and permanent frame structures Consider famous frame structure designs (effiel tower)</p> <p><b>Designing</b> Formulate step-by-step plans as a guide to making. Develop a design specification to guide the development of ideas Generate and develop prototypes and annotated sketches to aid the design process</p> <p><b>Making</b> Competently select from and use appropriate tools to accurately measure, mark put, shape and join construction materials Use finishing and decorative techniques that are suitable for the product you are designing</p> <p><b>Evaluating</b> Critically evaluate a product against the original design specification Identify strengths and areas for development by testing product design and suitability Evaluate it personally and seek evaluation from others</p> <p><b>Technical knowledge</b> Understand how to strengthen, stiffen and reinforce 3D frameworks</p> <p><u>Key Vocabulary</u> frame structure reinforce triangulation stability temporary permanent prototype specification innovation functional</p>

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## Design and Technology Progression Map



Y e a r 6	<p><b>Science unit: Electricity</b></p> <p><b>To make an alarm (Electric and digital)</b></p> 	<p><b>Science unit: Animals including humans</b></p> <p><b>To make a pastry snack (Cooking and Nutrition )</b></p> 	<p><b>Science unit: Evolution</b></p> <p><b>To make a mobile phone carrier (Textiles)</b></p> 
	<p><b>Research</b> Examine existing products and generate ideas through brainstorming and identify a purpose for their product. Create a design criteria Generate innovative ideas through research Discuss a range of relevant products that respond to changes in the environment using a computer control (nightlights, security lights)</p> <p><b>Designing</b> Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail. Select appropriate materials, tools and techniques. Design purposeful, functional, appealing products for the intended user Select from and use a range of tools including CAD to make products that are accurately assembled and well finished Communicate ideas through annotated sketches, circuit diagrams</p> <p><b>Making</b> Use skills in using different tools and equipment safely and accurately. Formulate a step by step plan to guide making Ensure products have a high quality finish using art skills where appropriate Create and modify a computer program to enable an electrical product to work automatically in respond to changes in the environment</p> <p><b>Evaluating</b> Evaluate a product against the original design specification. Evaluate it personally and seek evaluation from others.</p>	<p><b>Research</b> Investigate similar products to the one to be made to give starting points for a design.</p> <p><b>Designing</b> Write a recipe with detailed steps including tools to be used and explaining why. Measure accurately and calculate ratio of ingredients to scale up or down from a recipe.</p> <p><b>Making</b> Prepare a pastry dish using the 'rubbing' technique. Create and refine recipes including ingredients, methods, cooking times and temperatures.</p> <p><b>Evaluating</b> Critically evaluate the design of the product and suggest improvements for the user.</p> <p><b>Food and nutritional knowledge</b> Understand the correct handling and storage of ingredients.</p> <p><u><a href="#">Key Vocabulary</a></u> <u><a href="#">Mixing</a></u> <u><a href="#">Weighing</a></u> <u><a href="#">Rubbing in</a></u> <u><a href="#">Combining</a></u> <u><a href="#">Texture</a></u> <u><a href="#">Hygienic</a></u> <u><a href="#">Sweet Appearance</a></u> <u><a href="#">Techniques</a></u> <u><a href="#">Ingredients</a></u></p>	<p><b>Research</b> Examine existing products and generate ideas through brainstorming and identify a purpose for their product. Create a design criteria Generate innovative ideas through research</p> <p><b>Designing</b> Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail. Select appropriate materials, tools and techniques. Design purposeful, functional, appealing products for the intended user Select from and use a range of tools including CAD to make products that are accurately assembled and well finished</p> <p><b>Making</b> Use skills in using different tools and equipment safely and accurately. Cut and join with accuracy to ensure a good-quality product. Ensure products have a high quality finish using art skills where appropriate</p> <p><b>Evaluating</b> Evaluate a product against the original design specification. Evaluate it personally and seek evaluation from others. Test product with intended user in mind and critically evaluate quality of design, manufacture, functionality and fitness for purpose</p>

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	<p>Test product with intended user in mind and critically evaluate quality of design, manufacture, functionality and fitness for purpose</p> <p><b>Technical knowledge</b> Understand and use electrical systems in their products Apply their understanding of computing to program, monitor and control their products</p> <p><u>Key Vocabulary</u> series circuit parallel circuit names of switches and components input output system monitor control program</p>		<p><b>Technical knowledge</b> A 3D textile product can be made from a combination of accurately made pattern pieces Fabrics can be strengthened, stiffened and reinforced where appropriate</p> <p><u>Key Vocabulary</u> computer aided design (CAD) Computer aided manufacture (CAM) graphics modify prototype wadding reinforce pattern pieces template</p>
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