



# Shelton Junior School

## LKS2 DT Long-Term Progression of Knowledge and Skills



	DISCOVER – resilience and collaboration	INVESTIGATE – reflection and concentration	EXPLORE - curiosity
<b>Year A</b>	<b>Heroic Heritage – Why are beliefs important?</b>	<b>Nurturing Nature – How do plants and living things flourish?</b>	<b>Go With The Flow – How do people choose where to settle?</b>
	<b>Textiles – 2D shape to 3D product</b> Design, make and evaluate a simple purse related to stone age/iron age	<b>Food – healthy and varied diet</b> Design, make and evaluate a healthy, varied meal	<b>Structures – shell structures</b> Design, make and evaluate a lampshade/ bulb cover (including computer-aided design on Purple Mash)
<b>Year B</b>	<b>Incredible Invaders – Why do people always want more?</b>	<b>Magnets and Matter – Are all changes irreversible?</b>	<b>Active Planet – How do we control our emotions?</b>
	<b>Food – healthy and varied diet</b> Design, make and evaluate a bread based food item linked to the Roman/Anglo Saxon diet	<b>Mechanical systems – levers and linkages</b> Make an information poster about slides and levers, linked with magnets.	<b>Electrical systems – simple circuits and switches</b> Design, make and evaluate a nightlight using a variety of switches

	<b>Year 3 Skills</b>	<b>Year 4 Skills</b>
<b>Designing</b>	<ul style="list-style-type: none"> <li>• Use knowledge of a range of products to inform plans and designs.</li> <li>• Talk about and disassemble products and describe their function.</li> <li>• Use simple prototypes, labelled sketches and detailed instructions in plans and designs.</li> <li>• Talk in depth about ideas, plans and reasons for choices.</li> <li>• Describe the purpose of their products.</li> <li>• Indicate design features of their products.</li> <li>• Gather information about the needs and wants of individuals or groups.</li> <li>• Develop their own design criteria.</li> <li>• Share and clarify ideas through discussion.</li> <li>• Model ideas using prototypes.</li> <li>• Use annotated diagrams and some computer aided design packages to develop and communicate ideas.</li> <li>• Generate realistic ideas focusing on the needs of the user.</li> <li>• Begin to take account of the availability of resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Use research to develop design criteria that are fit for purpose.</li> <li>• Disassemble products and describe in detail their functions.</li> <li>• Use annotated sketches, cross-sectional, exploded diagrams and increasingly complex prototypes.</li> <li>• Support discussions about ideas, plans and designs with relevant information.</li> <li>• Describe the purpose of their products, indicate design features of their products.</li> <li>• Indicate design features of their products that will appeal to intended users.</li> <li>• Gather information about the needs and wants of individuals or groups.</li> <li>• Develop their own design criteria and use this to inform their ideas.</li> <li>• Share and clarify ideas confidently through discussion.</li> <li>• Model ideas using prototypes and pattern pieces.</li> <li>• Use annotated sketches, some cross-sectional drawings and computer aided design packages to develop and communicate ideas.</li> <li>• Generate realistic ideas focusing on the needs of the user.</li> <li>• Make design decisions that take account of the availability of resources.</li> <li>• Investigate and analyse who designed the products, where products were designed and made, when products were designed and made, whether products can be recycled or reused.</li> </ul>

<p><b>Making</b></p>	<ul style="list-style-type: none"> <li>• Use a wide range of materials and components. e.g. textiles, mechanical, construction kits, electrical and food ingredients.</li> <li>• Select some materials and components according to known characteristics and functions.</li> <li>• Select and use an increasing range of tools suitable to the task to cut, shape and join materials and components. Explain their choices.</li> <li>• Order the main stages of making.</li> <li>• Use a ruler to measure and mark lines for cutting with some accuracy.</li> <li>• Make and use gluing tabs.</li> <li>• Apply some finishing techniques.</li> <li>• Select an appropriate way to improve the appearance of a product.</li> <li>• Follow procedures for safety and hygiene.</li> </ul>	<ul style="list-style-type: none"> <li>• Select from and use an extensive range of materials and components according to both functional and aesthetic qualities. e.g. textiles, mechanical, construction kits, electrical and food ingredients.</li> <li>• Confidently select and use tools and equipment suitable to the task to measure, mark out, cut and shape materials and components with accuracy. Explain their choices giving evidence.</li> <li>• Order the main stages of making in logical steps.</li> <li>• Insert paper fasteners for card linkages.</li> <li>• Accurately assembles, joins and combines most materials.</li> <li>• Accurately applies several finishing techniques.</li> <li>• Selects the most effective finish to enhance the appearance of a product.</li> <li>• Follow procedures for safety and hygiene.</li> </ul>
<p><b>Evaluating</b></p>	<ul style="list-style-type: none"> <li>• Investigate and compare a range of similar existing products.</li> <li>• Compare and contrast the similarities and differences of products with the same function.</li> <li>• Identify the strengths and areas for development in their ideas and products.</li> <li>• Evaluate ideas and products against design criteria.</li> <li>• Investigate and analyse how well products have been designed and made; which materials and methods were used and were successful; how well the products worked; whether they achieved their purpose and the needs/ wants of the users and suggest ways in which products can be improved.</li> <li>• Recognise successful inventors, designers, chefs and engineers, who have been influential in the design and technology industries.</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate and begin to analyse a range of existing products.</li> <li>• Use knowledge of similarities and differences between products with the same function to support identification of most effective product.</li> <li>• Evaluate ideas and products against own design criteria, taking into account the views of others.</li> <li>• Identify the strengths and areas for development in their ideas and products.</li> <li>• Consider the views of others, including intended users, to improve their work.</li> <li>• Use their design criteria to evaluate and improve their completed products.</li> <li>• Investigate and analyse how well products have been designed and made; why materials have been chosen, what methods of construction were used; how well the products worked; whether they achieved their purpose and the needs/ wants of the users and suggest ways in which products can be improved.</li> <li>• Recognise several inventors, designers, chefs, manufacturers and engineers, who have been influential in the design and technology industries.</li> </ul>

<p><b>Technical knowledge</b></p>	<ul style="list-style-type: none"> <li>• Deconstruct a range of sliders and describe how they work.</li> <li>• Construct increasing complex sliders.</li> <li>• Join levers to make linkages to create moving parts.</li> <li>• Construct a simple pneumatic system with one moving part.</li> <li>• Deconstruct and assemble the net of basic 3D shapes.</li> <li>• Construct cubes of different sizes from a net.</li> <li>• Strengthen 2D frames by adding diagonal bracing struts.</li> <li>• Make a rectangular frame from strip wood.</li> <li>• Use materials to make simple joints, glue, tape and paper clips.</li> <li>• Describe how a simple battery powered circuit can be controlled by different kinds of switches.</li> <li>• Talk about simple electrical safety.</li> <li>• Create simple circuits incorporating a battery, bulb, switch, buzzer and wires.</li> <li>• With support attach a fixed axle to a chassis and add wheels ensuring that they can move freely.</li> <li>• Construct a simple pulley using rope over a horizontal bar to raise an object off the ground.</li> <li>• Use construction kits with gears to construct a line of gears that turn.</li> <li>• Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling.</li> <li>• Know that food is farmed, reared, grown, imported or caught locally, regionally and internationally.</li> <li>• Sort and classify an increasing range of food according to specific food groups, e.g. proteins, carbohydrates, fats etc.</li> <li>• Recognise that a healthy diet is made up of a variety and balance of different foods and drinks as depicted on 'The Eatwell Plate'.</li> <li>• Know that to be active and healthy, food is needed to provide energy for the body.</li> <li>• Discuss about the way in which food processing can affect the taste, appearance, texture and colour of food.</li> </ul>	<ul style="list-style-type: none"> <li>• Deconstruct and reconstruct a range of sliders and levers.</li> <li>• Vary the position of the pivot point to lift a load using a lever.</li> <li>• Construct a pneumatic with two moving parts.</li> <li>• Identify the cam within a simple mechanism and explain how movement is changed.</li> <li>• Deconstruct and assemble the net of a range of basic 3D shapes.</li> <li>• Join 2D frames to create 3D structures.</li> <li>• Make rectangular frames of different sizes using strip wood, reinforcing with cross braces.</li> <li>• Use a range of materials to make joints.</li> <li>• Give reasons for the selection of fabrics and techniques based on knowledge of characteristics.</li> <li>• Make and use a simple paper pattern.</li> <li>• Join fabrics in a range of different ways using zips, tie clasp, toggles, press-studs and buttons.</li> <li>• Use a wide range of simple finishing techniques.</li> <li>• Explore and describe how an electric motor can be used in a circuit.</li> <li>• Identify key features of electrical safety.</li> <li>• Use a remote-controlled device to switch lights on and off (including computer control packages)</li> <li>• Construct cuboids of different sizes from a net. <ul style="list-style-type: none"> <li>• Attach a fixed axle to a chassis and add wheels ensuring that they can move freely.</li> </ul> </li> <li>• Construct a pulley that allows a load to travel horizontally along a rope.</li> <li>• Use construction kits with gears to mesh gears at right angles.</li> <li>• Securely join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling</li> <li>• Know that food is farmed, reared, grown (home allotments), exported, imported or caught locally, regionally and internationally.</li> <li>• Gain an understanding of the ways in which specific food groups apply to the principles of a health and varied diet.</li> <li>• Know that a healthy diet is made up of a variety and balance of different foods and drinks as depicted on 'The Eatwell Plate.'</li> <li>• Know that to be active and healthy, food is needed to provide energy for the body.</li> </ul>
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		<ul style="list-style-type: none"> <li>• Give reasons for the way in which food processing can affect the taste, appearance, texture and colour of food.</li> </ul>
<b>Cooking and nutrition</b>	<ul style="list-style-type: none"> <li>• Talk about what needs to be done in order to work safely and hygienically.</li> <li>• Measure and weigh using standard units and scales.</li> <li>• Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify what needs to be done in order to work safely and hygienically when working on a range of tasks.</li> <li>• Convert measure and weigh using standard and imperial units.</li> <li>• Know how to prepare and cook a variety of savoury and some sweet dishes safely and hygienically, including the use of a heat source.</li> <li>• Know how to use a wide range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.</li> </ul>



# Shelton Junior School

## UKS2 DT Long-Term Progression of Knowledge and Skills



	DISCOVER – resilience and collaboration	INVESTIGATE – reflection and concentration	EXPLORE - curiosity
<b>Year A</b>	<b>Seeking Safety – Does adversity always make you stronger?</b>	<b>Stayin’ Alive – Are all living things equal?</b>	<b>The Amazing Americas – Do we always appreciate what we’ve got?</b>
	<p><b>Structures – frame structures</b> Design, make and evaluate a shelter focusing on the strength/rigidity of the join</p>	<p><b>Food – celebrating culture and seasonality</b> Design, make and evaluate a dish with seasonable products</p>	<p><b>Electrical systems – more complex switches and circuits</b> Design, make and evaluate a variety of circuits and explore more complicated switches. Use problem solving to fix broken circuits.</p>
<b>Year B</b>	<b>Ancient Civilisations – Why do people have different beliefs?</b>	<b>Survival of the Fittest – What’s the difference between surviving and living?</b>	<b>Amazon Adventures – Why do people explore?</b>
	<p><b>Textiles – combining different fabric shapes</b> Design, make and evaluate a fabric item using weaving (including computer-aided design on Purple Mash)</p>	<p><b>Food – celebrating culture and seasonality</b> Design, make and evaluate a yeast-based snack</p>	<p><b>Mechanical systems – pulleys or gears</b> Design, make and evaluate a pulley system</p>

	<b>Year 5 Skills</b>	<b>Year 6 Skills</b>
<b>Designing</b>	<ul style="list-style-type: none"> <li>• Describe in detail the purpose of their products.</li> <li>• Indicate design features of their products that will appeal to intended users.</li> <li>• Gather information about the needs and wants of individuals or groups.</li> <li>• Develop their own design criteria and use this to inform their ideas.</li> <li>• Carry out research. E.g. surveys and interviews to identify users’ needs, wants and preferences.</li> <li>• Develop a simple design specification to guide their thinking.</li> <li>• Share and clarify ideas through discussion</li> <li>• Link discussions about ideas, plans and designs to the investigation, disassembly and evaluation of a range of products describing in detail their parts and their function.</li> <li>• Produce detailed designs and plans using prototypes, commentary and diagrams that include accurate measurements.</li> <li>• Use annotated sketches, cross-sectional drawings, exploded diagrams to develop and communicate ideas.</li> <li>• Generate plans and designs based on research and ideas that take account of the users’ views and the intended purpose.</li> <li>• Make design decisions that take account of the availability of resources.</li> <li>• Generate innovative ideas from prior research.</li> <li>• Make design decisions based on time, cost and resource constraints.</li> <li>• Investigate and analyse: who designed the products, where products were designed and made; when products were designed and made; whether products can be recycled or re-used.</li> </ul>	<ul style="list-style-type: none"> <li>• Describe in detail the purpose of their products.</li> <li>• Indicate design features of their products that will appeal to intended users.</li> <li>• Gather information about the needs and wants of individuals or groups.</li> <li>• Develop their own design criteria and use this to inform their ideas.</li> <li>• Carry out research. e.g. surveys, interviews, questionnaires to identify users’ needs, wants and preferences.</li> <li>• Develop detailed design specifications to guide their thinking and planning.</li> <li>• Share and clarify ideas confidently through discussion <ul style="list-style-type: none"> <li>• Clarify and justify plans, designs and ideas by drawing upon and using a range of relevant sources of information.</li> </ul> </li> <li>• Produce detailed designs and plans drawn to scale from a range of viewpoints.</li> <li>• Use annotated sketches, cross-sectional drawings, exploded diagrams to develop and communicate ideas.</li> <li>• Discuss ways in which ideas, plans and designs are formed and modify to ensure that the design criteria are met effectively.</li> <li>• Generate realistic ideas focusing on the needs of the user.</li> <li>• Make design decisions that take account of the availability of resources.</li> <li>• Generate innovative ideas drawing on research.</li> <li>• Make informed decisions based on time, cost and resource constraints.</li> <li>• Investigate and analyse: who designed the products; where the products are designed and made; when were the products designed and made; whether products can be recycled or re-used.</li> </ul>
<b>Making</b>	<ul style="list-style-type: none"> <li>• Select and use with support an extensive range of materials and components according to both functional and aesthetic qualities. E.g. textiles, mechanical, construction kits, electrical and food ingredients.</li> <li>• Select materials and components suitable to the task.</li> <li>• Select tools and equipment suitable to the task. Explain their choices.</li> <li>• Produce with support an appropriate list of tools, equipment and materials that they will need.</li> <li>• Order the stages of the making process in logical steps.</li> <li>• Formulate step-by-step plans as a guide to making.</li> <li>• Measures, marks out, cuts and shapes materials and components with accuracy.</li> <li>• Accurately assembles, joins and combines most materials.</li> <li>• Applies the most effective finish to enhance the appearance of a product using a range of finishing techniques, including those from art and design sessions.</li> <li>• Use techniques that involve a number of steps.</li> </ul>	<ul style="list-style-type: none"> <li>• Select from and use an extensive range of materials and components according to both functional and aesthetic qualities. E.g. textiles, mechanical, construction kits, electrical and food ingredients.</li> <li>• Select materials and components suitable to the task.</li> <li>• Confidently select tools and equipment suitable to the task. Explain their choices, giving evidence.</li> <li>• Produce an appropriate list of tools, equipment and materials that they will need.</li> <li>• Order the stages of the making process in logical steps.</li> <li>• Formulate detailed step-by-step plans as a guide to making.</li> <li>• Measures, marks out, cuts and shapes materials and components with accuracy and precision.</li> <li>• Accurately assembles, joins and combines a range of materials and components using the most effective permanent and temporary way.</li> </ul>

	<ul style="list-style-type: none"> <li>• Use resourcefulness when tackling practical problems.</li> <li>• Follow procedures for safety and hygiene.</li> </ul>	<ul style="list-style-type: none"> <li>• Accurately applies the most effective finish to ensure a high quality end product using a range of finishing techniques, including those from art and design sessions.</li> <li>• Use techniques that involve a number of steps.</li> <li>• Use resourcefulness, resilience and innovation when tackling practical problems.</li> <li>• Explains next steps in learning drawing from prior experience.</li> <li>• Follow and have awareness for procedures for safety and hygiene.</li> </ul>
<p><b>Evaluating</b></p>	<ul style="list-style-type: none"> <li>• Investigate and use analysis of existing products to inform own work.</li> <li>• Identify from a range the key features and functions needed to create an effective and efficient working product.</li> <li>• Identify the strengths and areas for development in their ideas and products.</li> <li>• Consider the views of others, including intended users, to improve their work.</li> <li>• Use their design criteria to evaluate and improve their completed products.</li> <li>• Evaluate the quality of the design, manufacture and fitness for purpose of their products.</li> <li>• Evaluate their ideas and products against their original design specification giving reasons, supported by factual evidence for the success of aspects of a product.</li> <li>• Investigate and analyse how well products have been designed and made; why materials have been chosen and what methods of construction were used; how well the products worked; whether they achieved their purpose and the needs/ wants of the users.</li> <li>• Consider cost and sustainability.</li> <li>• Consider the impact and innovative qualities of their products.</li> <li>• Recognise several inventors, designers, chefs, manufacturers and engineers, who have been influential in the design and technology industries.</li> </ul>	<ul style="list-style-type: none"> <li>• Use analysis of existing products supported by accurate factual information to inform own work.</li> <li>• Test and evaluate products to identify the variants which may affect the function of a product.</li> <li>• Identify the strengths and areas for development in their ideas and products.</li> <li>• Collect the views of others, including intended users, to improve their work.</li> <li>• Use their design criteria to evaluate and improve their completed products.</li> <li>• Critically evaluate the quality of the design, manufacture and fitness for purpose of their products.</li> <li>• Evaluate their ideas and products against their original design specification giving reasons, supported by factual evidence for the success of aspects of a product and provide considered solutions to resolve those parts that could be improved.</li> <li>• Investigate and analyse how well products have been designed and made; why materials have been chosen and what methods of construction were used; how well the products worked; whether they achieved their purpose and the needs/ wants of the users.</li> <li>• Investigate and analyse how much products cost to make, how innovative products are, how sustainable the materials in the products are, what impact products have beyond their intended purpose.</li> <li>• Investigate several inventors, designers, chefs, manufacturers and engineers, who have been influential in the design and technology industries.</li> </ul>

<p><b>Technical knowledge</b></p>	<ul style="list-style-type: none"> <li>• Describe in detail the way in which an axle and chassis help a vehicle to move.</li> <li>• Use a range of different ways to attach an axle to a chassis, e.g. card triangles, drilled holes, cable clips and clothes pegs.</li> <li>• Identify, describe and evaluate products that contain pulleys and drive belts.</li> <li>• Create pulleys and drive systems.</li> <li>• Explore and describe how electrical circuits can be created and controlled.</li> <li>• Discuss in depth the hazards and safety issues associated with electricity.</li> <li>• Explore and explain how the direction and speed of an electrical motor can be controlled.</li> <li>• Explore and program a simple control device.</li> <li>• Create a range of sliders and levers to produce horizontal and vertical movement.</li> <li>• Combine sliders and levers to produce a range of movements.</li> <li>• Generate questions to investigate and compare the efficiency of pneumatic systems.</li> <li>• Describe the way in which a cam changes rotary motion into linear motion.</li> <li>• Create nets of increasingly complex 3D shapes which include the addition of gluing tabs.</li> <li>• Reinforce and strengthen 3D framework using the concept of ‘triangulation’.</li> <li>• Explain in detail why some structures fail.</li> <li>• Use a range of materials to make joints e.g., card strips, elastic bands, thread and ties, and plastic tubing.</li> <li>• Understand how fabrics can be strengthened, stiffened and reinforced where appropriate.</li> <li>• Understand how simple 3-D textile products are made, using a template to create two identical shapes.</li> <li>• Describe how food is farmed, reared, grown, imported or caught locally, regionally and internationally.</li> <li>• Begin to know that seasons and weather affect food availability.</li> <li>• Talk in scientific terms about the physical and chemical changes that take place when food is cooked, e.g. heated and cooled</li> <li>• Know that a healthy diet is made up of a variety and balance of different foods and drinks as depicted on ‘The Eatwell Plate’.</li> <li>• Know that to be active and healthy, food is needed to provide energy for the body.</li> <li>• Know that different foods contain substances that are needed for health. E.g. water, fibre, vitamins and nutrients.</li> <li>• Begin to know how food is processed into ingredients that can be eaten or used in cooking.</li> </ul>	<ul style="list-style-type: none"> <li>• Design and build a working model where the direction of movement can be controlled, e.g. with a chassis with a pivoting axle.</li> <li>• Explain how a belt and pulley system can be used to reverse the direction of rotation, and alter the plane of rotation by 90 degrees.</li> <li>• Explain how the number of teeth of a gear affects the speed of rotation.</li> <li>• Explore and describe how switches can be used in a range of circuits to control components, e.g. lights in a lighthouse, a movement sensor in a burglar alarm.</li> <li>• Apply appropriate safety measures when constructing circuits.</li> <li>• Explore and discuss ways in which electricity can be used to control movement.</li> <li>• Explore and use an increasing range of complex control system, e.g., a light sensor.</li> <li>• Use a range of technical vocabulary to describe the properties and functions of mechanisms.</li> <li>• Choose and use a range of sliders and levers accurately to create a range of effects.</li> <li>• Analyse and evaluate the efficiency of pneumatic systems</li> <li>• Discuss the relationship between a cam and follower, an off-centre cam, a peg cam, a pear-shaped cam and a snail cam.</li> <li>• Create nets and templates accurately in a range of sizes.</li> <li>• Use a range of increasing methods to strengthen 3D structures and frames.</li> <li>• Investigate measure and record the load tolerance of different structures and find ways of improving a structures load-bearing capacity.</li> <li>• Build a range of structures using a wide range of effective materials.</li> <li>• Understand how simple 3-D textile products are made, using a template to create two identical shapes.</li> <li>• Strengthen, stiffen and reinforce fabrics where appropriate.</li> <li>• Know that food is farmed, reared, grown, imported or caught locally, regionally and internationally.</li> <li>• Begin to know that seasons and weather affect food availability.</li> <li>• Talk in scientific terms about the physical and chemical changes that take place when food is cooked, e.g. heated and cooled</li> <li>• Begin to know how food is processed into ingredients that can be eaten or used in cooking.</li> <li>• Compare commercial and domestic processes for producing food, e.g. bread.</li> <li>• Know that a healthy diet is made up of a variety and balance of different foods and drinks as depicted on ‘The Eatwell Plate’.</li> <li>• Know that to be active and healthy, food is needed to provide energy for the body.</li> </ul>
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<p><b>Cooking and nutrition</b></p>	<ul style="list-style-type: none"> <li>• Know how to prepare and cook a variety of savoury and some sweet dishes safely and hygienically, including the use of a heat source.</li> <li>• Know how to use a wide range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.</li> <li>• Talk about the impact of changing proportions within a recipe and use knowledge of food and cooking to generate own recipes.</li> <li>• Know that recipes can be adjusted to change the taste, texture, aroma and appearance.</li> <li>• Talk about and give reasons for the need to work safely and hygienically.</li> </ul>	<ul style="list-style-type: none"> <li>• Know how to prepare and cook a variety of savoury and some sweet dishes safely and hygienically, including the use of a heat source.</li> <li>• Know how to use a wide range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.</li> <li>• Select the appropriate methods and equipment for measuring, e.g. time, dry goods, liquids etc.</li> <li>• Talk about the impact of changing proportions within a recipe and use knowledge of food and cooking to generate own recipes.</li> <li>• Know that recipes can be adjusted to change the taste, texture, aroma and appearance.</li> <li>• Know and understand the practice needed in terms of food hygiene and kitchen safety.</li> </ul>