

## Design and Technology Progression Planner

The effective teaching and learning of design and technology should equip children to actively contribute to the creativity, wealth and well-being of themselves, their community and the nation. Design and technology at The Willows gives children the opportunity to develop skills, knowledge and an understanding of the world in which we live and work. It fosters the creativity and exploration that children will develop and apply in all aspects of the curriculum. Children leaving The Willows will be able to research, evaluate, design and make functional products for a number of purposes through a range of contexts, including:

Key Stage One: **Food** **Textiles** **Structures** **Mechanisms**

Key Stage Two: **Food** **Textiles** **Structures** **Mechanical Systems** **Electrical Systems**

Through the deliverance of the purposeful and context based D&T curriculum outlined below, children leaving The Willows will be able to take risks, be resourceful, be innovative and be enterprising problem solvers.

	Focus	NC Objectives <b>Explore</b>	Skills <b>Discover</b>	Vocabulary	Resources/Other	<b>Dream</b>
<b>Year 1</b>	<b>Food:</b> Breakfast Pancakes	See food progression map				Chef Food product designer Nutritionist Dietician
	<b>Mechanisms:</b> Sliders and levers  Moving Pictures Peg Dolls	<p><b>Design</b></p> <p>☑ design purposeful, functional, appealing products for themselves and other users based on design criteria</p> <p><b>Make</b></p> <p>☑ select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</p> <p><b>Technical knowledge</b></p>	<p><b>Investigative and Evaluative Activities (IEAs)</b></p> <p>Discuss, investigate and, where practical, disassemble different examples</p> <p><b>Focused Tasks (FTs)</b></p> <p>Children learn how to create simple sliders and have a go.</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p>	<p><b>design</b> <b>make</b> <b>evaluate</b> <b>purpose</b> <b>user</b></p> <p>slider, lever, pivot, slot, bridge/guide</p> <p>paper fastener, join pull, push, up, down, straight, curve</p> <p>forwards, backwards</p>	<p>books and everyday products with levers and slider mechanisms</p> <p>slider and lever teaching aids</p> <p>card strips and rectangles paper masking tape paper fasteners stick glue/PVA glue</p> <p>finishing materials and media</p> <p>left/right handed scissors, cutting mats, card drills</p>	<p>Illustrator Card designer Craft worker Animation Puppeteer</p>

		<p>☒ explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</p>	<p>Design and make their own peg doll. Discuss and evaluate their design with a partner.</p> <p>Cutting (scissors/Hole punchers)</p> <p>Drawing</p> <p>Sticking</p>			
	<p><b>Food:</b> Instant Noodle Soup</p>	<p>See Food progression</p>				<p>Chef Food product designer Nutritionist Dietician</p>
<p><b>Year 2</b></p>	<p><b>Food:</b> Bread Great Fire of London</p>	<p>See food progression</p>				<p>Chef Food product designer Nutritionist Dietician Baker</p>
	<p><b>Mechanisms:</b> Wheels and Axels  Fire engines</p>	<p><b>NC Objectives:</b></p> <p><b>Design</b></p> <ul style="list-style-type: none"> <li>design purposeful, functional, appealing products for themselves and other users based on design criteria</li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li>select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</li> <li>select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>explore and evaluate a range of existing products</li> <li>evaluate their ideas and products against design criteria</li> </ul> <p><b>Technical knowledge</b></p>	<p><b>Skills:</b> <b>Investigative and Evaluative Activities (IEAs)</b></p> <p>Explore and evaluate a range of wheeled products such as toys and everyday objects.</p> <p><b>Focused Tasks (FTs)</b></p> <p>Ensure that children are taught how to mark out, hold, cut and join materials and components correctly.</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <p>Identify a user and purpose for the product and generate simple criteria.</p> <p>Using construction kits with wheels and axles, ask children to make a product that moves.</p> <p>children might add finishing techniques to their product</p>	<p><b>Vocab:</b> design make evaluate purpose user +function +product</p> <p>Vehicle Wheel Axle axle holder body assembling cutting joining finishing fixed/free/moving mechanism names of tools</p>	<p><b>Possible Resources:</b> selection of toy vehicles with differently fixed axles (evaluate)</p> <p>card boxes card cotton reels plastic tubing dowel clothes pegs paper sticks/dowel,</p> <p>paper/plastic straws, card discs, MDF wheels</p> <p>single hole punch cutting mat masking tape PVA glue double sided sticky fixers junior hacksaw vice left/right handed scissors</p>	<p>Engineer Mechanic Car manufacturer Animation Toy maker</p>

		<ul style="list-style-type: none"> <li>explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</li> </ul>	Ask children to evaluate their finished product.			
	<p><b>Textiles: Templates and joining</b></p> <p>Felt puppets</p>	<p><b>NC Objectives:</b></p> <p><b>Design</b></p> <p>☑ design purposeful, functional, appealing products for themselves and other users <b>based on design criteria</b></p> <p>generate, develop, model and communicate their ideas through talking, drawing, templates, <b>mock-ups</b> and, where appropriate, information and communication technology</p> <p><b>Make</b></p> <p>☑ select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</p>	<p><b>Skills:</b></p> <p><b>Investigative and Evaluative Activities (IEAs)</b></p> <p>Explore different and popular examples of puppets.</p> <p><b>Focused Tasks (FTs)</b></p> <p>Demonstrate appropriate examples of joining techniques for children to practise in guided groups e.g. running stitch including threading own needle, stapling and gluing.</p> <p>Ensure that children are taught how to mark out, hold, cut and join materials and components correctly.</p> <p>Finishing techniques for children to practise in guided groups e.g. sewing buttons, 3-D fabric paint, gluing sequins, printing.</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <p>Think about the user and purpose of products.</p> <p>Design and create product applying skills learnt in focused tasks.</p>	<p><b>Vocab:</b></p> <p>design make evaluate purpose user function product</p> <p><b>Finishing Pattern Template Sew Thread Materials Joining Marking Shaping</b></p>	<p><b>Possible Resources:</b></p> <p>Glue guns PVA Pritt stick Scissors Needles Threads</p> <p><b>Finishing Materials:</b></p> <p>Sequins Buttons</p>	<p><b>Fashion designer Seamstress Interior designer Costume designer</b></p>

	<b>Food:</b> Fruit Kebabs: Alice in Wonderland	<b>See food progression</b>				Chef Food product designer Nutritionist Dietician Baker
<b>Year 3</b>	<b>Food:</b> Replacing the Snozzcumber sandwiches	<b>See food progression map</b>				Chef Food product designer Nutritionist Dietician Health advisor
	<b>Structures:</b> Free standing structure	<b>NC Objectives:</b> <b>Designing</b> <ul style="list-style-type: none"> <li>• Generate ideas based on simple design criteria and their own experiences, explaining what they could make.</li> <li>• Develop, model and communicate their ideas through talking, mock-ups and drawings.</li> </ul> <b>Making</b> <ul style="list-style-type: none"> <li>• Select and use tools, skills and techniques, explaining their choices.</li> <li>• Select new and reclaimed materials and construction kits to build their structures.</li> <li>• Use simple finishing techniques suitable for the structure they are creating.</li> </ul> <b>Evaluating</b> <ul style="list-style-type: none"> <li>• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.</li> <li>• Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.</li> </ul> <b>Technical knowledge and understanding</b> <ul style="list-style-type: none"> <li>• Know how to make freestanding structures stronger, stiffer and more stable.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<b>Skills:</b> <b>Investigative and Evaluative Activities (IEAs)</b>  Where possible, ask the children to draw or photograph the structures they have been exploring and label with the correct technical vocabulary in relation to the structure,  <b>Focused Tasks (FTs)</b>  Demonstrate measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools and new and reclaimed materials  <b>14. Design, Make and Evaluate Assignment (DMEA)</b> <ul style="list-style-type: none"> <li>• Develop a design brief with the children within a context which is authentic and meaningful.</li> <li>• Using annotated sketches, cross-sectional and exploded diagrams, as appropriate, ask the children to develop, model and communicate their ideas.</li> <li>• Evaluate throughout and the final products against the intended purpose</li> </ul>	<b>Vocab:</b> design make evaluate purpose user criteria functional product  cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved  user, purpose, function, prototype, design criteria, innovative, appealing, design brief	<b>Possible Resources:</b>  aluminium foil, paper fasteners, paper clips, card, corrugated plastic, reclaimed materials, finishing materials and media	<b>Mechanic</b> <b>Engineer</b> <b>Electrician</b> <b>Robotics</b>
	<b>Structures:</b>	<b>NC Objectives:</b>	<b>Skills:</b>	<b>Vocab:</b> design	<b>Possible Resources:</b>	<b>Product designer</b>

	<p>Shell Structures, Designing a package</p>	<p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Experience of using different joining, cutting and finishing techniques with paper and card.</li> <li>• A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Order the main stages of making.</li> <li>• Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.</li> <li>• Explain their choice of materials according to functional properties and aesthetic qualities.</li> <li>• Use finishing techniques suitable for the product they are creating.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Test and evaluate their own products against design criteria and the intended user and purpose.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Develop and use knowledge of how to construct strong, stiff shell structures.</li> <li>• Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.</li> </ul>	<p><b>Investigative and Evaluative Activities (IEAs)</b></p> <ul style="list-style-type: none"> <li>• Evaluate existing products to determine which designs children think are the most effective. Provide opportunities for the children to judge the suitability of the shell structures for their intended users and purposes. Discuss graphics including colours/impact of style/logo/size of font</li> </ul> <p><b>Focused Tasks (FTs)</b></p> <ul style="list-style-type: none"> <li>• Practise making nets out of card, joining flat faces with masking tape to create 3-D shapes.</li> <li>• Demonstrate skills and techniques of scoring, cutting out and assembling using pre-drawn nets. Then allow children to practise by constructing a simple box. Show how a window could be cut out.</li> <li>• Demonstrate how to use different ways of stiffening and strengthening their shell structures</li> </ul> <p>Children discuss and explore the graphics techniques and media that could be used to achieve the desired appearance of their products.</p> <ul style="list-style-type: none"> <li>• Practise using computer-aided design (CAD) software to design the net, text and graphics for their products according to purposes.</li> </ul> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <p>Ask the children to use annotated sketches and prototypes to develop, model and communicate their ideas for the product</p>	<p><b>make</b> <b>evaluate</b> <b>purpose</b> <b>user</b> <b>criteria</b> <b>functional</b> <b>product</b></p> <p>shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype</p>	<p>collection of shell structures for different purposes and users</p> <p>card, squared paper, coloured paper, adhesive tape, masking tape, PVA glue, glue spreaders, acetate sheet, pencils, felt-tip pens, rulers, right/left handed scissors</p> <p>computer with computer-aided design (CAD) software, printer</p>	<p><b>Graphics – gaming, comics, magazines, advertisement</b></p> <p><b>Toy manufacturer</b></p>
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			Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.			
Year 4	<p><b>Mechanisms and structure:</b> Levers and linkages</p> <p>Egyptian Shaduf Free standing Structure with pulley system</p>	<p><b>NC Objectives:</b></p> <p><b>Design</b></p> <ul style="list-style-type: none"> <li>use research and develop design criteria to inform the design of innovative, <u>functional</u>, appealing products that are fit for purpose, <u>aimed at particular individuals or groups</u></li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li><u>select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</u></li> <li>select from and use a wider range of materials and components, including <u>construction materials</u>, textiles and ingredients, according to their functional properties and aesthetic qualities</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>understand how key events and individuals in design and technology have helped shape the world</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>understand and use mechanical systems in their products [for example, gears, <u>pulleys</u>, cams, <u>levers</u> and linkages]</li> </ul>	<p><b>Skills:</b> Investigative and Evaluative Activities (IEAs)</p> <p>Explore a range of old and new irrigation systems and products that use a pulley system (toys, engineering etc)</p> <p><b>Focused Tasks (FTs)</b></p> <p>Create simple pulley system in the classroom to demonstrate it's use.</p> <p>If using dowel, demonstrate different methods of joining:</p> <p>Tubing Blue tac</p> <p>Explore use of straws or wood, which is best?</p> <p>Understanding triangulation - using triangles for rigidity</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <p>Using knowledge of different methods, materials etc, ch to design and make their own Shaduf.</p> <p>Evaluate each other's final product, does it work?</p>	<p><b>Vocab:</b> design make evaluate purpose user criteria functional product</p> <p>Compression Tension Diagonal Horizontal Vertical Triangulations Frame structure</p> <p>Plus Related topic vocab</p>	<p><b>Possible Resources:</b></p> <p>Saw Dowel straws String Card (base + joining) Tubing? Joins</p>	<p>Engineer Construction – builder Architect</p>
	<p><b>Textiles:</b> Roman Shoes</p>	<p><b>NC Objectives:</b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>Have joined fabric in simple ways by gluing</li> </ul>	<p><b>Skills:</b> Investigative and Evaluative Activities (IEAs)</p> <ul style="list-style-type: none"> <li>Children investigate a range of textile products that have a</li> </ul>	<p><b>Vocab:</b> design make evaluate purpose</p>	<p><b>Possible Resources:</b></p>	<p>Fashion designer Interior design Shoe maker Costume designer</p>

		<ul style="list-style-type: none"> <li>• Have used simple patterns and templates for marking out.</li> <li>• Have evaluated a range of textile products.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan the main stages of making.</li> <li>• Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.</li> <li>• Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Test their product against the original design criteria and with the intended user.</li> <li>• Understand how a key event/individual has influenced the development of the chosen product and/or fabric.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Know how to strengthen, stiffen and reinforce existing fabrics.</li> <li>• Understand how to securely join two pieces of fabric together.</li> <li>• Understand the need for patterns and seam allowances.</li> </ul>	<p>selection of stitches, joins, fabrics, finishing techniques, fastenings and purposes, linked to the product they will design, make and evaluate.</p> <p>Give children the opportunity to disassemble appropriate textiles products to gain an understanding of 3-D shape, patterns and seam allowances.</p> <p><b>Focused Tasks (FTs)</b></p> <ul style="list-style-type: none"> <li>• Demonstrate a range of stitching techniques and allow children to practise sewing two small pieces of fabric together, demonstrating the use of, and need for, seam allowances.</li> </ul> <p>Provide a range of fabrics – children to consider whether fabrics are suitable for the chosen purpose and user. The fabrics also can be used for demonstrating and testing out a range of decorative finishing techniques e.g. appliqué, embroidery, fabric pens/paints, printing.</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <ul style="list-style-type: none"> <li>• Children to assemble their product using their existing knowledge, skills and understanding from IEAs and FTs. Encourage children to think about the aesthetics and quality finish of their product</li> </ul> <p>Evaluate as the process is undertaken and the final product in relation to the design brief and criteria. The product should be tested by the intended user and for its purpose and others' views</p>	<p>user criteria functional product</p> <p>fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance</p> <p>user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces</p>	<p>collection of textile products linked to the chosen product to be made</p> <p>selection of fabrics and fastenings</p> <p>left/right handed scissors, needles, thread, tape, fabric glue, pins, measuring tape</p> <p>items to use for finishing e.g. fabric paints, threads, appliqué pieces, paints for printing, thin paint brushes</p>	
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			sought to help with identifying possible improvements.			
Year 5	<p><b>Structures Mechanisms</b></p> <p><b>Victorian Toy Frame Structures + CAMS mechanism</b></p>	<p><b>NC Objectives:</b></p> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.</li> <li>Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.</li> <li>Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks.</li> <li>Use finishing and decorative techniques suitable for the product they are designing and making.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>Investigate and evaluate a range of existing frame structures.</li> <li>Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.</li> <li>Research key events and individuals relevant to frame structures.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>Understand how to strengthen, stiffen and reinforce 3-D frameworks.</li> <li>Know and use technical vocabulary relevant to the project.</li> </ul>	<p><b>Skills:</b></p> <p>Sawing</p> <p>Test and use various ways of joining, wood or plastic.</p> <p><b>Investigative and Evaluative Activities (IEAs)</b></p> <p>Explore different examples of toys and products that use CAMS.</p> <p><b>Focused Tasks (FTs)</b></p> <p>Practice different ways of joining dowels.</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <p><b>Who is the toy aimed at?</b></p> <p><b>How should the CAMS system support this?</b></p> <p>Children to assemble their product using their existing knowledge, skills and understanding from IEAs and FTs.</p> <p>Ask the children to use annotated sketches and prototypes to develop, model and communicate their ideas for the product</p> <p>Evaluate throughout and the final products against the intended purpose and with the intended user.</p>	<p><b>Vocab:</b></p> <p>design make evaluate purpose user criteria functional product</p> <p>frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional</p>	<p><b>Possible Resources:</b></p> <p>products, photographs, web-based resources of existing frame structures</p> <p>card, paper straws, newspaper, square sectioned wood,</p> <p>masking tape, PVA glue pencils,</p> <p>rulers, right/left handed scissors, bench hooks, junior hacksaws, glass paper</p> <p>finishing media and materials</p>	<p>Engineer Construction Carpenter Joiner Toy maker Product design</p>
	<p><b>Textiles:</b></p> <p>Purse</p>	<p><b>NC Objectives:</b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>Experience of basic stitching, joining textiles and finishing techniques.</li> <li>Experience of making and using simple pattern pieces.</li> </ul>	<p><b>Skills:</b></p> <p><b>Investigative and Evaluative Activities (IEAs)</b></p> <ul style="list-style-type: none"> <li>Children investigate, analyse and evaluate a range of existing products which have been produced by combining fabric shapes. Investigate work by designers and their impact on</li> </ul>	<p><b>Vocab:</b></p> <p>design make evaluate purpose user criteria functional product</p>	<p><b>Possible Resources:</b></p> <p>existing textile products for investigation and deconstruction linked to their product</p> <p>wide selection of textiles including reclaimed and reusable fabrics</p>	<p>Fashion designer – Sportswear</p> <p>Costume designer</p>

		<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate innovative ideas by carrying out research including surveys, interviews and questionnaires.</li> <li>• Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design.</li> <li>• Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Produce detailed lists of equipment and fabrics relevant to their tasks.</li> <li>• Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate and analyse textile products linked to their final product.</li> <li>• Compare the final product to the original design specification.</li> <li>• Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</li> <li>• Consider the views of others to improve their work.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.</li> <li>• Fabrics can be strengthened, stiffened and reinforced where appropriate.</li> </ul>	<p>fabrics and products. Use questions to develop children's understanding</p> <p><b>Focused Tasks (FTs)</b></p> <ul style="list-style-type: none"> <li>• Develop skills of threading needles and joining textiles using a range of stitches. This activity must build upon children's earlier experiences of stitches</li> <li>• Develop skills of sewing textiles by joining right side together and making seams. Children should investigate how to sew and shape curved edges by snipping seams, how to tack or attach wadding or stiffening and learn how to start and finish off a row of stitches.</li> <li>• Develop skills of 2-D paper pattern making using grid or tracing paper to create a 3-D mock-up of a chosen product. Remind/teach how to pin a pattern on to fabric ensuring limited wastage, how to leave a seam allowance and different cutting techniques.</li> <li>• Develop skills of computer-aided design (CAD) by using on-line pattern making software to generate pattern pieces.</li> </ul> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <p>Communicate ideas through detailed, annotated drawings from different perspectives and/or computer-aided design. Drawings should indicate design decisions made, the methods of strengthening, the type of fabrics to be used and the types of stitching that will be incorporated.</p>	<p>seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces</p> <p>name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper</p> <p>design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype</p>	<p>pins, needles, thread, measuring tape, left/right handed fabric scissors, pinking shears iron, iron transfer paper, sewing machine</p> <p>range of fastenings, materials for insulating or strengthening e.g. bubble wrap, wadding, interfacing</p> <p>finishing materials e.g. sequins, buttons, fabric paints</p>	
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Year 6	<b>Food:</b>	<b>See food progression document</b>				
	<b>Mechanical/ Electrical Systems: Pulleys and gears</b>	<p><b>NC Objectives:</b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Experience of axles, axle holders and wheels that are fixed or free moving.</li> <li>• Basic understanding of electrical circuits, simple switches and components.</li> <li>• Experience of cutting and joining techniques with a range of materials including card, plastic and wood.</li> <li>• An understanding of how to strengthen and stiffen structures.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Develop a simple design specification to guide their thinking.</li> <li>• Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</li> <li>• Investigate famous manufacturing and engineering companies relevant to the project.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand that mechanical and electrical systems have an input, process and an output.</li> <li>• Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</li> </ul>	<p><b>Skills:</b> <b>Investigative and Evaluative Activities (IEAs)</b></p> <ul style="list-style-type: none"> <li>• Investigate, analyse and evaluate existing everyday products and existing or pre-made toys that incorporate gear or pulley systems. Use videos and photographs of products that cannot be explored through first-hand experience.</li> </ul> <p><b>Focused Tasks (FTs)</b></p> <ul style="list-style-type: none"> <li>• Using a construction kit, investigate combinations of two different sized pulleys to learn about direction and speed of rotation</li> </ul> <p>Develop measuring, marking, cutting, shaping and joining skills using junior hacksaws, G-clamps, bench hooks, square section wood, card triangles and hand drills to construct wooden frames, as appropriate. Demonstrate the accurate use of tools and equipment.</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <ul style="list-style-type: none"> <li>• Children generate innovative ideas by carrying out research</li> <li>• Communicate ideas through detailed, annotated drawings from different views and/or exploded diagrams.</li> <li>• Produce detailed step-by-step plans</li> <li>• Make high quality products, applying knowledge, understanding and skills from IEAs and FTs.</li> <li>• Evaluate throughout and the final product in use, comparing</li> </ul>	<p><b>Vocab:</b> <b>design</b> <b>make</b> <b>evaluate</b> <b>purpose</b> <b>user</b> <b>criteria</b> <b>functional</b> <b>product</b></p> <p>pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor</p> <p>circuit, switch, circuit diagram</p> <p>annotated drawings, exploded diagrams</p> <p>mechanical system, electrical system, input, process, output</p> <p>design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief</p>	<p><b>Possible Resources:</b></p> <p>videos, photographs and everyday products or toys with pulleys or gears</p> <p>batteries, battery holders, wires, motors, switches, aluminium foil, paper fasteners, paper clips, card, motors, dowel, paper sticks</p> <p>consumable and construction kit pulleys or gears of different sizes, elastic bands</p> <p>junior hacksaws, glass paper, G-clamps, bench hooks, hand drill, automatic wire strippers</p> <p>PVA glue, sticky pads, masking tape, dowel, double-sided tape, card triangles, square section wood, card, corrugated plastic, finishing media</p>	<p><b>Engineer</b> <b>Construction</b> <b>Carpenter</b> <b>Joiner</b> <b>Toy maker</b> <b>Product design</b></p> <p><b>Mechanical engineer (cars)</b></p>

			it to the original design specification. Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for the intended user and purpose.			
	<b>Structures</b>	<p><b><u>NC Objectives:</u></b></p> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.</li> <li>• Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used.</li> <li>• Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks.</li> <li>• Use finishing and decorative techniques suitable for the product they are designing and making.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate and evaluate a range of existing frame structures.</li> <li>• Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.</li> <li>• Research key events and individuals relevant to frame structures.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand how to strengthen, stiffen and reinforce 3-D frameworks.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<p><b><u>Skills:</u></b></p> <p>Sawing</p> <p><b>Test and use various ways of joining, wood or plastic.</b></p> <p><b>Investigative and Evaluative Activities (IEAs)</b></p> <p>Explore different examples of toys and products that use CAMS.</p> <p><b>Focused Tasks (FTs)</b></p> <p>Practice different ways of joining dowels.</p> <p><b>Design, Make and Evaluate Assignment (DMEA)</b></p> <p><b>Who is the toy aimed at?</b></p> <p><b>How should the CAMS system support this?</b></p> <p>Children to assemble their product using their existing knowledge, skills and understanding from IEAs and FTs. Encourage children to think about the aesthetics and quality finish of their product</p> <p>Ask the children to use annotated sketches and prototypes to develop, model and communicate their ideas for the product Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.</p>	<p><b><u>Vocab:</u></b></p> <p>design make evaluate purpose user criteria functional product</p> <p>frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional</p>	<p><b><u>Possible Resources:</u></b></p> <p>products, photographs, web-based resources of existing frame structures</p> <p>card, paper straws, newspaper, square sectioned wood,</p> <p>masking tape, PVA glue pencils,</p> <p>rulers, right/left handed scissors, bench hooks, junior hacksaws, glass paper</p> <p>finishing media and materials</p>	<p><b>Engineer Construction Carpenter Joiner Toy maker Product design</b></p>