



## Aston Tower Primary School Long Term overview for Key Stage 1 and 2 –

### Design and Technology

Year group	Autumn Term	Spring Term	Summer Term
1	<p><b><u>Mechanisms - Slides and levers</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Early experiences of working with paper and card to make simple flaps and hinges.</li> <li>• Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape.</li> </ul> <p><b>Designing</b></p> <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 drawings and mock-ups with card and paper.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan by suggesting what to do next.</li> <li>• Select and use tools, explaining their choices, to cut, shape and join paper and card.</li> <li>• Use simple finishing techniques suitable for the product they are creating.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Explore a range of existing books and everyday products that use simple sliders and levers.</li> <li>• Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.</li> </ul>	<p><b><u>Structures - Freestanding structures</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Experience of using construction kits to build walls, towers and frameworks.</li> <li>• Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card.</li> <li>• Experience of different methods of joining card and paper.</li> </ul> <p><b>Designing</b></p> <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> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan by suggesting what to do next.</li> <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> <p><b>Evaluating</b></p> <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> </ul>	<p><b><u>Food - Preparing food and vegetable (including cooking and nutritional requirements for KS1)</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell.</li> <li>• Experience of cutting soft fruit and vegetables using appropriate utensils.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Design appealing products for a particular user based on simple design criteria.</li> <li>• Generate initial ideas and design criteria through investigating a variety of fruit and vegetables.</li> <li>• Communicate these ideas through talk and drawings.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely.</li> <li>• Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences.</li> <li>• Evaluate ideas and finished products against design criteria, including intended user and purpose.</li> </ul>

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	<p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Explore and use sliders and levers.</li> <li>• Understand that different mechanisms produce different types of movement.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <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> <p><b>Technical knowledge and understanding</b></p> <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>	<p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand where a range of fruit and vegetables come from e.g. farmed or grown at home.</li> <li>• Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of <i>The eatwell plate</i>.</li> <li>• Know and use technical and sensory vocabulary relevant to the project.</li> </ul>
2	<p><b><u>Mechanisms - Wheels and axles</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Assembled vehicles with moving wheels using construction kits.</li> <li>• Explored moving vehicles through play.</li> <li>• Gained some experience of designing, making and evaluating products for a specified user and purpose.</li> <li>• Developed some cutting, joining and finishing skills with card.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate initial ideas and simple design criteria through talking and using own experiences.</li> <li>• Develop and communicate ideas through drawings and mock-ups.</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 perform practical tasks such as cutting and joining to allow movement and finishing.</li> <li>• Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.</li> </ul>	<p><b><u>Structures - Shell Structures</u></b></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>• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product.</li> <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><u>Textiles - Templates and joining techniques</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Explored and used different fabrics.</li> <li>• Cut and joined fabrics with simple techniques.</li> <li>• Thought about the user and purpose of products.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Design a functional and appealing product for a chosen user and purpose based on simple design criteria.</li> <li>• Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.</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 perform practical tasks such as marking out, cutting, joining and finishing.</li> <li>• Select from and use textiles according to their characteristics.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Explore and evaluate a range of existing textile products relevant to the project being undertaken.</li> <li>• Evaluate their ideas throughout and their final products against original design criteria.</li> </ul>

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	<p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Explore and evaluate a range of products with wheels and axles.</li> <li>• Evaluate their ideas throughout and their products against original criteria.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Explore and use wheels, axles and axle holders.</li> <li>• Distinguish between fixed and freely moving axles.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used.</li> <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> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand how simple 3-D textile products are made, using a template to create two identical shapes.</li> <li>• Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling.</li> <li>• Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>
3	<p><b><u>Structures - Shell structures using computer-aided design</u></b></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> <li>• Familiarity with general purpose software that can be used to draw accurate shapes, such as Microsoft Word, or simple computer-aided design (CAD), such as 2D Primary by Techsoft.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product.</li> <li>• Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas.</li> </ul>	<p><b><u>Food - Health and a varied diet (including cooking and nutritional requirements for KS2)</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Know some ways to prepare ingredients safely and hygienically.</li> <li>• Have some basic knowledge and understanding about healthy eating and <i>The eatwell plate</i>.</li> <li>• Have used some equipment and utensils and prepared and combined ingredients to make a product.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.</li> <li>• Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</li> </ul>	<p><b><u>Textiles - 2-D shape to 3-D product</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Have joined fabric in simple ways by gluing and stitching.</li> <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> <li>• Produce annotated sketches, prototypes, final product sketches and pattern pieces.</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>

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	<p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan the order of the main stages of making.</li> <li>• Select and use appropriate tools and software 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 computer-generated finishing techniques suitable for the product they are creating.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used.</li> <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 nets of cubes and cuboids and, where appropriate, more complex 3D shapes.</li> <li>• Develop and use knowledge of how to construct strong, stiff shell structures.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan the main stages of a recipe, listing ingredients, utensils and equipment.</li> <li>• Select and use appropriate utensils and equipment to prepare and combine ingredients.</li> <li>• Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.</li> <li>• Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Know how to use appropriate equipment and utensils to prepare and combine food.</li> <li>• Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.</li> <li>• Know and use relevant technical and sensory vocabulary appropriately.</li> </ul>	<p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate a range of 3-D textile products relevant to the project.</li> <li>• Test their product against the original design criteria and with the intended user.</li> <li>• Take into account others' views.</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> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>
4	<p><b><u>Mechanical Systems – Pneumatics</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Explored simple mechanisms, such as sliders and levers, and simple structures.</li> <li>• Learnt how materials can be joined to allow movement.</li> <li>• Joined and combined materials using simple tools and techniques.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user.</li> </ul>	<p><b><u>Electrical Systems - Simple circuits and switches</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers.</li> <li>• Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Gather information about needs and wants, and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups.</li> </ul>	<p><b><u>Food - Celebrating culture &amp; seasonality. (including cooking and nutritional requirements for KS).</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Know some ways to prepare ingredients safely and hygienically.</li> <li>• Have some basic knowledge and understanding about healthy eating and <i>The eatwell plate</i>.</li> <li>• Have used some equipment and utensils and prepared and combined ingredients to make a product.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Use annotated sketches and prototypes to develop, 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 from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.</li> <li>• Select from and use finishing techniques suitable for the product they are creating.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate and analyse books, videos and products with pneumatic mechanisms.</li> <li>• Evaluate their own products and ideas against criteria and user needs, as they design and make.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand and use pneumatic mechanisms.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Order the main stages of making.</li> <li>• Select from and use tools and equipment to cut, shape, join and finish with some accuracy.</li> <li>• Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Investigate and analyse a range of existing battery-powered products.</li> <li>• Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.</li> <li>• Apply their understanding of computing to program and control their products.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.</li> <li>• Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Plan the main stages of a recipe, listing ingredients, utensils and equipment.</li> <li>• Select and use appropriate utensils and equipment to prepare and combine ingredients.</li> <li>• Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.</li> <li>• Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Know how to use appropriate equipment and utensils to prepare and combine food.</li> <li>• Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.</li> <li>• Know and use relevant technical and sensory vocabulary appropriately.</li> </ul>

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5	<p><b><u>Structures - Frame structures</u></b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials.</li> <li>• Basic understanding of what structures are and how they can be made stronger, stiffer and more stable.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources.</li> <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> </ul>	<p><b><u>Textiles - Combining different fabric shapes</u></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>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>• Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</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><u>Mechanical Systems – Cams</u></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 different types of movement.</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>• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.</li> <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>• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</li> <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>• Compare the final product to the original design specification.</li> <li>• Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</li> </ul>

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	<ul style="list-style-type: none"> <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>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>	<ul style="list-style-type: none"> <li>• Consider the views of others to improve their work.</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 systems have an input, process and an output.</li> <li>• Understand how cams can be used to produce different types of movement and change the direction of movement.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>
6	<p><b>Mechanical Systems - Pulleys or gears</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>• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.</li> <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>Textiles - Using computer-aided design (CAD in textiles)</b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Experience of stitching, joining and finishing techniques in textiles.</li> <li>• Experience of making and using textiles pattern pieces.</li> <li>• Experience of simple computer-aided design applications.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Generate innovative ideas through research including surveys, interviews and questionnaires.</li> <li>• Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes including using 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>• Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</li> </ul>	<p><b>Electrical systems - Monitoring and control</b></p> <p><b>Prior learning</b></p> <ul style="list-style-type: none"> <li>• Initial experience of using computer control software and an interface box, a standalone box or microcontroller, e.g. Crumble.</li> <li>• Some experience of writing and modifying a program to make a light turn on or flash on and off.</li> <li>• Understanding of the essential characteristics of a series circuit and experience of creating a battery-powered, functional, electrical product.</li> </ul> <p><b>Designing</b></p> <ul style="list-style-type: none"> <li>• Develop a design specification for a functional product that responds automatically to changes in the environment.</li> <li>• Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.</li> </ul> <p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components.</li> </ul>

Year group	Autumn Term	Spring Term	Summer Term
	<p><b>Making</b></p> <ul style="list-style-type: none"> <li>• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</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>• 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> <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> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>	<ul style="list-style-type: none"> <li>• Select from and use a range of tools and equipment, including CAD, 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, where safe and practical, 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>	<ul style="list-style-type: none"> <li>• Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.</li> <li>• Create and modify a computer control program to enable their electrical product to respond to changes in the environment.</li> </ul> <p><b>Evaluating</b></p> <ul style="list-style-type: none"> <li>• Continually evaluate and modify the working features of the product to match the initial design specification.</li> <li>• Test the system to demonstrate its effectiveness for the intended user and purpose.</li> </ul> <p><b>Technical knowledge and understanding</b></p> <ul style="list-style-type: none"> <li>• Understand and use electrical systems in their products.</li> <li>• Understand the use of computer control systems in products.</li> <li>• Apply their understanding of computing to program, monitor and control their products.</li> <li>• Know and use technical vocabulary relevant to the project.</li> </ul>