

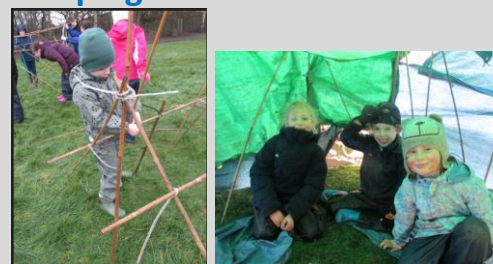
Design and Technology: Progression of Skills and knowledge




EYFS

	Physical Development	Understanding the World	Expressive Art and Design	Vocabulary
Three and four year olds (nursery)	<ul style="list-style-type: none"> Use large-muscle movements to wave flags and streamers, paint and make marks. Choose the right resources to carry out their own plan. Use one-handed tools and equipment, for example, making snips in paper with scissors. 	<ul style="list-style-type: none"> Explore how things work. 	<ul style="list-style-type: none"> Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Create closed shapes with continuous lines, and begin to use these shapes to represent objects. 	<h3 style="margin: 0;">Cut, stick, shape, join, make, materials, ideas, tools, colour, texture</h3>
Reception	<ul style="list-style-type: none"> Progress towards a more fluent style of moving, with developing control and grace. Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor. 		<ul style="list-style-type: none"> Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills. 	
Early Learning Goals (End of reception)	<ul style="list-style-type: none"> Fine Motor Skills: Use a range of small tools, including scissors, paintbrushes and cutlery. 		<ul style="list-style-type: none"> Creating with Materials: Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used. 	

KS1 & KS2


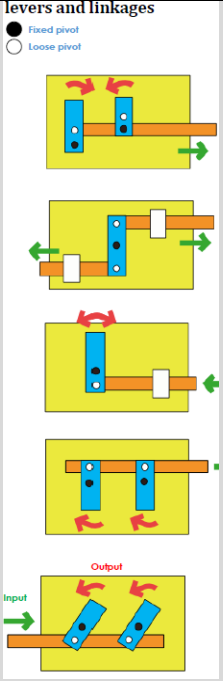
	Process	Mechanisms	Structures	Textiles
Year 1	<ul style="list-style-type: none"> I can create a simple design for my product I can use pictures and words to describe what I want to do I can ask simple questions about existing products and those that I have made 	<p>Projects on a page: Wheels and Axles Design a winding mechanism – Links to great Fire of London.</p> <ul style="list-style-type: none"> I can use wheels and axles in a product I can explore and use mechanisms such as wheels and axles in a product I can choose tools I would like to use and select materials based on my knowledge of their properties (Y2) I can safely measure, mark out, cut and shape materials and components using a range of tools (Y2) <p>Day project – wheels and axels – making a moving car</p>	<p>Day projects: Creating inventions and structures – loose parts play trolley</p> <p>Structures and food day – denbuilding and camping</p>	<p>Projects on a page: Templates and joining techniques Make a hand/glove puppet – Beatrix Potter</p> <ul style="list-style-type: none"> I can sort cut and shape fabrics and experiment in ways of joining them I can develop techniques to join fabrics and apply decorations (y2)



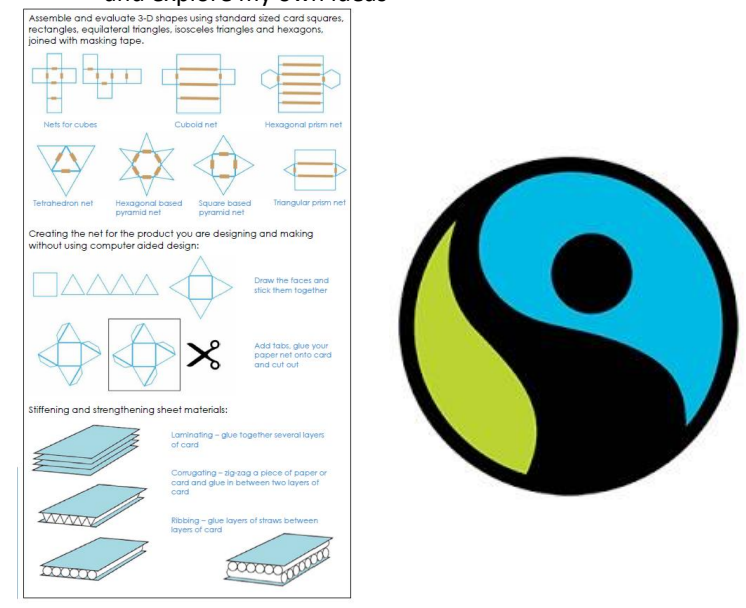
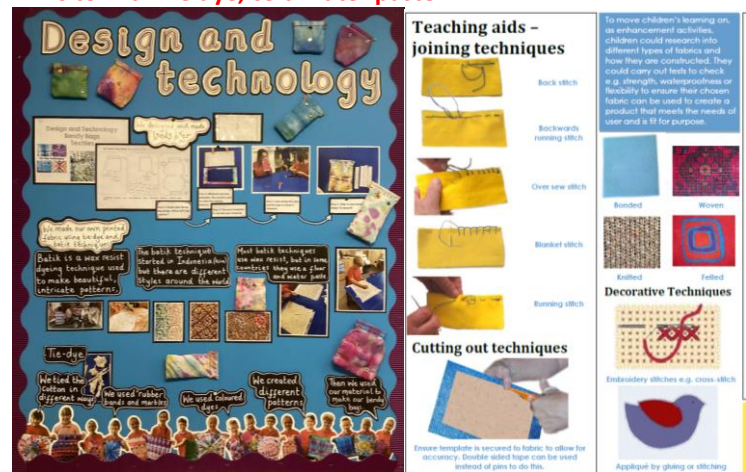

	<p>Ongoing throughout the year through continuous provision activities linked to learning: Cut, stick and shape – making woodland animals Cut, join, shape, stick – split pins</p> 			
<p>Vocabulary</p>	<p>design, make, evaluate, purpose, user, criteria, functional</p>	<ul style="list-style-type: none"> • Axle – a rod on which one or more wheels can rotate, either freely or be fixed to and turn with the axle. • Axle holder – the component through which an axle fits and rotates. • Chassis – the frame or base on which a vehicle is built. • Friction – resistance which is encountered when two things rub together. • Dowel – wooden rods used for making axles to hold wheels 		<ul style="list-style-type: none"> • Appliqué – to attach a decorative fabric item onto another piece of fabric by gluing and/or sewing. • Design – to generate, develop and communicate ideas for a product. • Embroider – to decorate fabric with stitches. • Evaluate – to judge how a product meets chosen criteria. • Fray – to unravel or become worn at the edge. • Glove puppet – a glove puppet fits over the hand, and the fingers operate its head and arms. • Mock-up – a model which allows children to try out ideas using cheaper materials and temporary joints. • Seam – a row of stitches joining two pieces of fabric. • Sew – to join pieces of fabric with stitches. • Template – a shape drawn to assist in cutting out shapes
<p style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: 48px; font-weight: bold;">Year 2</p>	<p style="text-align: center; font-weight: bold;">Process</p>	<p style="text-align: center; font-weight: bold;">Mechanisms</p>	<p style="text-align: center; font-weight: bold;">Structures</p>	<p style="text-align: center; font-weight: bold;">Textiles</p>
	<ul style="list-style-type: none"> • I can design useful, pleasing products for myself and other users based on a design brief • I can generate, develop model and communicate my ideas through talking, drawing, templates, mock-ups and IT. • I can evaluate and assess existing products and those that I have made using a design criteria 	<p><u>Projects on a page - Sliders and Levels</u> Moving pictures</p> <ul style="list-style-type: none"> • I can select from and use a range of tools and equipment to perform practical tasks e.g cutting, shaping, joining & finishing (Y1) • I can use a range of simple tools to cut, join and combine materials and components safely. (Y1) • I can explore and use mechanisms such as levers and sliders in a product 	<p><u>Projects on a page: Free Standing</u> A chair for my Bear</p> <ul style="list-style-type: none"> • I can build structures exploring how they can be made stronger, stiffer and more stable • I can investigate different techniques for stiffening a variety of materials and explore different methods of enabling structures to remain stable 	
<p>Vocabulary</p>	<p>design, make, evaluate, user, purpose, ideas, design criteria, product, function</p>	<ul style="list-style-type: none"> • Mechanism – a device used to create movement in a product. • Lever – a rigid bar which moves around a pivot. Levers are used in many everyday products. • Pivot – a point about which a lever turns. • Fixed pivot – a paper fastener that joins card strips to the backing card. • Slider – a rigid bar which moves backwards and forwards along a straight line. Unlike a lever, a slider does not have a pivot point. • Slot – the hole through which a lever or slider is placed to enable part of a picture to move. 	<ul style="list-style-type: none"> • Freestanding structure – a structure that stands on its own foundation or base without attachment to anything else. • Stability – in relation to a freestanding structure, the extent to which it is likely to fall over if a force is applied. Buttress – a structure added to a wall, tower or framework to make it more stable and/or reinforce it. • Brick bonding – arranging bricks in a wall to improve the performance of the structure or improve its appearance. • Mock-up – 3-D representation of a product. 	

		<ul style="list-style-type: none"> • Guide or bridge – a short card strip used to keep sliders in place and control movement. 		
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Year 3	Process	Mechanisms	Structures	Textiles
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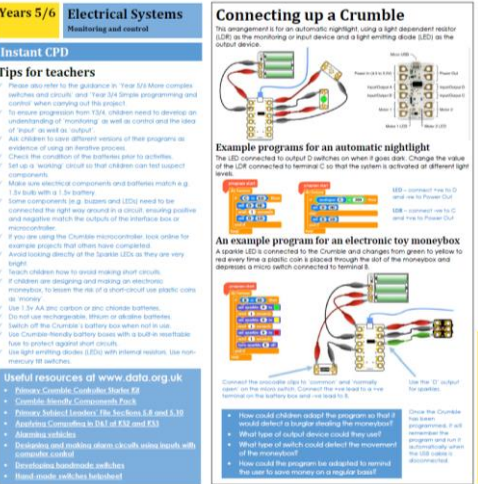
	<ul style="list-style-type: none"> • I can use my knowledge of existing products to design my own functional product. • I can create designs using annotated sketches, cross-sectional diagrams and simple computer programmes • I can investigate and analyse existing products and those I have made, considering a wide range of factors. 	<p>Projects on a page: Levers and Linkages</p> <p>Moving greetings card</p> <ul style="list-style-type: none"> • I can safely measure, mark out, cut, assemble and join with some accuracy. (Y3) • I can make suitable choices from a wider range of tools and unfamiliar materials and plan out the main stages of using them. (Y3) • I can understand how mechanical systems such as levers and linkages or pneumatic systems create movement. (Y3) <p>Projects on a page: Mechanical Systems:</p> <p>Pneumatics – snapping dragons</p> <ul style="list-style-type: none"> • I can use techniques which require more accuracy to cut, shape, join and finish work e.g cutting internal shapes and slots • I can use my knowledge of techniques and the functional and aesthetic qualities of a wide range of materials to plan how to use them. 	 	
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<u>Vocabulary</u>	<p>Levers and linkages</p> <ul style="list-style-type: none"> • Mechanism – a device used to create movement in a product. • Lever – a rigid bar which moves around a pivot. Levers are used in many everyday products. • Linkage – the card strips joining one or more levers to produce the type of movement required. The term 'linkage' is also used to describe the lever and linkage mechanism as a whole. • Slot – the hole through which a lever is placed to enable part of a picture to move. • Guide or bridge – a short card strip used to keep lever and linkage mechanisms in place and control movement. • Loose pivot – a paper fastener that joins card strips together. • Fixed pivot – a paper fastener that joins card strips to the backing card. • System – Systems have an input, process and an output. In a lever and linkage mechanism, the 'input movement' is where the user pushes or pulls a card strip. The 'output movement' is where one or more parts of the picture move. <p>Pneumatics</p> <ul style="list-style-type: none"> • Compressed – something that is squashed, such as air in a tube. • Input – what goes into a system. • Output – what comes out of a system. • Pivot – a point about which a lever turns. • Lever – a beam which turns about a point. • Pneumatic – a system that works using gases (air). Hydraulic – a system that works using liquids (water) • Pressure – the force used on an object or surface. • Inflate – fill something with air or a gas to make it swell up. • Deflate – remove the pressurised air to allow an object like a balloon to shrink. • Syringe – a tube with a nozzle and plunger for sucking and blowing air or liquids 			
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Year 4	Process	Mechanisms	Structures	Textiles
	<ul style="list-style-type: none"> I can use knowledge of existing products to design a functional and appealing product for a particular purpose and audience I can create designs using exploding diagrams I can consider how existing products and my own finished products might be improved and how well they meet the needs of the intended user. 		<p>Projects on a page - Shell Structures Banish broken biscuits – planning available (data)</p> <ul style="list-style-type: none"> I can strengthen frames with diagonal struts I can apply techniques I have learnt to strengthen structures and explore my own ideas 	<p>Projects on a page: 2D shapes to 3D product Bendy bags</p> <ul style="list-style-type: none"> I can add detail to my work using different types of stitch, including cross stitch. (Y3) I know how to strengthen, stiffen and reinforce existing fabrics. I understand how to securely join two pieces of fabric together. I understand the need for patterns and seam allowances. I know and use technical vocabulary relevant to the project <p>Links to Art - Tie dye, cold water paste</p> 
Vocabulary			<ul style="list-style-type: none"> Cuboid – a solid body with rectangular sides. Edge – where two surfaces meet at an angle. Face – a surface of a geometric shape. Font – a printer’s term meaning the style of lettering being used. Net – the flat or opened-out shape of an object such as a box. Prism – a solid geometric shape with ends that are similar, equal and parallel. Scoring – cutting a line or mark into sheet material to make it easier to fold. Shell structure – a hollow structure with a thin outer covering. Vertex – used to refer to the corners of a solid geometric shape, where edges meet 	<ul style="list-style-type: none"> Appliqué – means ‘applied’ - describes method of stitching/gluing patches onto fabric (originally to mend holes in worn clothes) to provide decoration. Pattern/Template – a shape drawn to exact shape and size and used to assist cutting out. Seam – a line of stitching that joins pieces of fabrics together. Seam Allowance – extra fabric allowed for joining together - usually 1.5cm. Prototype – a model that is made to test whether a design will work. Aesthetics – the way in which the product looks with the nature and expression of beauty.
Year 5	Process	Mechanisms	Structures	Textiles
	<ul style="list-style-type: none"> I can use my research into existing products and market research to inform the design of my own innovative product I can create prototypes to show my ideas I can make careful precise measurements so that joins, holes and openings are in exactly the right place I can produce step by step plans to 	<p>Projects on a page: Cams Projects on a page: More complex switches</p> 	<p>Projects on a page: Frame Structures</p> <ul style="list-style-type: none"> I can build more complex 3D structures and apply my knowledge of strengthening techniques to make them stronger or more stable. I can use a wide range of methods to strengthen, stiffen and reinforce complex structures and can use them accurately and appropriately. (Y6) 	

	<p>guide my making, demonstrating that I can apply my knowledge of different materials, tools and techniques.</p> <ul style="list-style-type: none"> I can make detailed evaluations about existing products and my own considering the views of others to improve my work 		<p>Bird hides – RSPB links</p> <p>Den building</p> 	
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<p>Vocabulary</p>			<ul style="list-style-type: none"> Modelling – the process of making a 3-D representation of a structure or product. Compression – the application of pressure to squeeze an object. Strut – a part of a structure under compression. Tension – a force pulling on a material or structure. Tie – a part of a structure under tension. Diagonal – a straight line that goes from one corner to another inside a shape. Horizontal – a line that is parallel to the ground. Vertical – a line that is at right angles to the ground Triangulation – the use of triangular shapes to strengthen a structure. Frame structure – a structure made from thin components e.g. tent frame 	
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Year 6</p>	<p style="text-align: center;">Process</p>	<p style="text-align: center;">Mechanisms</p>	<p style="text-align: center;">Electrical Systems.</p>	<p style="text-align: center;">Textiles</p>
	<ul style="list-style-type: none"> I can use research I have done into famous designers and inventors to inform my designs I can generate, develop, model and communicate my ideas through discussion, annotated sketches, cross sectional and exploding diagrams, prototypes, pattern pieces and computer-aided design. I can apply my knowledge of materials and techniques to refine and rework my products to improve its functional properties and aesthetic qualities I can use my technical knowledge and accurate skills to problem solve during the making process I can use my knowledge of famous designers to further explain the effectiveness of existing products and products I have made. 	<p>Projects on a page: Gears and Pulleys and STEM Rocket Car project</p> 	<p>Projects on a page: Monitoring and control</p> <ul style="list-style-type: none"> I can understand and use electrical systems in my products (Y4) Links to Science. I can understand how to use more complex mechanical and electrical systems (Y5) I can apply my understanding of computing to program, monitor and control my products. (Y6) 	

<p>Vocabulary</p>	<ul style="list-style-type: none"> • Pulley – a grooved wheel over which a drive belt can run. • Gear – a wheel with teeth around its circumference. • Drive belt – the belt which connects and transfers movement between two pulleys. • Gearing up or down – changing the rotational speed of a product by the use of pulleys or gears. When a small pulley or gear is used to drive a larger one the rotational speed is reduced and the product has been geared down. • Mechanical system – a set of related parts or components used to create movement. • Driver – the gear or pulley that provides the input movement to the system. • Follower – the gear or pulley that provides the output movement to the system. • Mesh – the point where two gears join together and transfer movement. • Motor spindle – the rod on the end of the motor onto which a gear or pulley is attached. 	<ul style="list-style-type: none"> • Program – a sequence of instructions that can be used to control electrical components. • Microcontroller – a device that can be programmed to control how an electrical product operates. • Light emitting diode (LED) – an output device that glows when electricity is passed through it. • System – a set of related parts or components that together achieve a desired outcome. • Output devices – components that produce an outcome e.g. bulbs, motors and buzzers. • Input devices – components that are used to control an electrical circuit e.g. switches. • Process – how a computer program controls one or more output devices. 	
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“Think big, think differently and always creatively.”