

DESIGN AND TECHNOLOGY LONG TERM PLAN



EYFS	KS1		LKS2		UKS2	
Nursery/Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>NC Objectives</p> <p>Key stage 1 Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment]. When designing and making, pupils should be taught to:</p> <p>Design -design purposeful, functional, appealing products for themselves and other users based on design criteria -generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p> <p>Make -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</p> <p>Evaluate -explore and evaluate a range of existing products - evaluate their ideas and products against design criteria</p> <p>Technical knowledge -build structures, exploring how they can be made stronger, stiffer and more stable -explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</p> <p>Cooking and nutrition - use the basic principles of a healthy and varied diet to prepare dishes -understand where food comes from</p>		<p>NC Objectives</p> <p>Key stage 2 Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. When designing and making, pupils should be taught to:</p> <p>Design -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups - generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Make -select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately -select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</p> <p>Evaluate -investigate and analyse a range of existing products -evaluate their ideas and products against their own design criteria and consider the views of others to improve their work - understand how key events and individuals in design and technology have helped shape the world</p> <p>Technical knowledge -apply their understanding of how to strengthen, stiffen and reinforce more complex structures -understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] -understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] -apply their understanding of computing to program, monitor and control their products.</p> <p>Cooking and nutrition -understand and apply the principles of a healthy and varied diet -prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques -understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</p>			
	<p>Chris Quigley's Essentials Skills Milestone 1</p> <p>Master practical skills:</p> <p>Food</p> <ul style="list-style-type: none"> • Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients. <p>Materials</p> <ul style="list-style-type: none"> -Cut materials safely using tools provided. • Measure and mark out to the nearest centimetre. • Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). 		<p>Chris Quigley's Essentials Skills Milestone 2</p> <p>Master Practical skills</p> <p>Food</p> <ul style="list-style-type: none"> • Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking). <p>Materials</p> <ul style="list-style-type: none"> • Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. 		<p>Chris Quigley's Essentials Skills Milestone 3</p> <p>Master Practical skills</p> <p>Food</p> <ul style="list-style-type: none"> -Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures. <p>Materials</p>	

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		<ul style="list-style-type: none"> • Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). <p>Textiles</p> <ul style="list-style-type: none"> • Shape textiles using templates. • Join textiles using running stitch. • Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing). <p>Electronics</p> <ul style="list-style-type: none"> • Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage). <p>Computing</p> <ul style="list-style-type: none"> • Model designs using software. <p>Construction</p> <p>Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.</p> <p>Mechanics</p> <ul style="list-style-type: none"> • Create products using levers, wheels and winding mechanisms. <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Use software to design. <p>Take inspiration from design throughout history</p> <ul style="list-style-type: none"> • Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created. 	<ul style="list-style-type: none"> • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). <ul style="list-style-type: none"> • Select appropriate joining techniques. <p>Textiles</p> <ul style="list-style-type: none"> • Understand the need for a seam allowance. • Join textiles with appropriate stitching. • Select the most appropriate techniques to decorate textiles. <p>Electronics</p> <ul style="list-style-type: none"> • Create series and parallel circuits <p>Computing</p> <ul style="list-style-type: none"> • Control and monitor models using software designed for this purpose <p>Construction</p> <ul style="list-style-type: none"> • Choose suitable techniques to construct products or to repair items. • Strengthen materials using suitable techniques. <p>Mechanics</p> <p>Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, gears winding mechanisms and pulleys)</p> <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> -Design with purpose by identifying opportunities to design. • Make products by working efficiently (such as by carefully selecting materials). • Refine work and techniques as work progresses, continually evaluating the product design. • Use software to design and represent product designs <p>Take inspiration from design throughout history</p> <ul style="list-style-type: none"> • Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work. 	<p>Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).</p> <ul style="list-style-type: none"> • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper). <p>Textiles</p> <p>Create objects (such as a cushion) that employ a seam allowance.</p> <ul style="list-style-type: none"> • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration). • Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion). <p>Electronics</p> <p>-Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).</p> <p>Computing</p> <p>-Write code to control and monitor models or products.</p> <p>Construction</p> <p>Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).</p> <p>Mechanics</p> <ul style="list-style-type: none"> • Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs. <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate. • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. <p>Take inspiration from design throughout history</p> <p>-Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.</p> <ul style="list-style-type: none"> • Create innovative designs that improve upon existing products. • Evaluate the design of products so as to suggest improvements to the user experience. 			
AU1	<p>Nursery</p> <p>Recognises colours and chooses them for a purpose. –</p> <p>Uses thick paint brushes.</p> <p>Reception</p>	<p>FOOD – FAMILY PICNIC NC: Cooking and nutrition - use the basic principles of a healthy and varied diet to prepare dishes -understand where food comes from</p> <p>Skills (CQ)</p> <p>Food:</p>	<p>FOOD – FRUIT SMOOTHIES AND FRUIT SALAD NC: Cooking and nutrition - use the basic principles of a healthy and varied diet to prepare dishes -understand where food comes from</p> <p>Skills (CQ)</p>	<p>PNEUMATICS – MOVING TOYS NC: Technical knowledge -apply their understanding of how to strengthen, stiffen and reinforce more complex structures -understand and use mechanical systems in their products [for example, gears,</p>	<p>FOOD – EGYPTIAN FLATBREADS / SALAD NC: Cooking and nutrition -understand and apply the principles of a healthy and varied diet -prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</p>	<p>FOOD – SOUTH AMERICAN MAIN MEAL – CHILLI NC: Cooking and nutrition understand and apply the principles of a healthy and varied diet -prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</p>	<p>FOOD – DESIGN INDIAN MAIN MEAL (CURRIES) NC: Cooking and nutrition understand and apply the principles of a healthy and varied diet -prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</p>

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<p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function –</p> <p>Follow drawings and curved and straight lines to create line drawings of different buildings</p>	<ul style="list-style-type: none"> • Cut, peel or grate ingredients safely and hygienically. • Assemble or cook ingredients. 	<p>Food</p> <ul style="list-style-type: none"> • Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients. 	<p>pulleys, cams, levers and linkages</p> <p>Design</p> <p>-use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p> <p>Skills (CQ)</p> <p>Mechanics</p> <p>Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, gears winding mechanisms and pulleys</p> <p>Materials</p> <ul style="list-style-type: none"> • Cut materials accurately and safely by selecting appropriate tools. • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). <p>Construction</p> <ul style="list-style-type: none"> • Choose suitable techniques to construct products or to repair items. -Strengthen materials using suitable techniques. 	<p>-understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</p> <p>Skills (CQ)</p> <ul style="list-style-type: none"> • Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking). 	<p>-understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</p> <p>Skills (CQ)</p> <p>-Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms).</p> <ul style="list-style-type: none"> • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures. 	<p>-understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</p> <p>Skills (CQ)</p> <p>-Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms).</p> <ul style="list-style-type: none"> • Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. • Demonstrate a range of baking and cooking techniques. • Create and refine recipes, including ingredients, methods, cooking times and temperatures.
	<p>Why?</p> <p>Children will learn the basics of food preparation in this unit, learning how to prepare the ingredients for a sandwich and where these come from. It will be linked to the local allotment where children will see first hand where many of the salad vegetables grow.</p>	<p>Why?</p> <p>This supports further learning about healthy eating and children will encounter fruits which they haven't tried before, learning about where they come from and how they can be prepared.</p>	<p>Why?</p> <p>This unit introduces pupils to creating movement with air using pneumatic mechanisms. They will then apply this knowledge to develop a moving toy.</p>	<p>Why?</p> <p>Children will have the chance to make savoury dishes, linked to their learning in history. There will be increased complexity in the food preparation in this unit, exposing children to foods not tried before.</p>	<p>Why?</p> <p>This links to children's studies of south America, giving children a taste of savoury dishes from that area whilst also growing their repertoire of foods to eat and prepare which could also be done at home.</p>	<p>Why?</p> <p>This is linked to the children's history study of Islamic Civilisation. Making a curry from scratch will allow children to appreciate the cultural heritage of India but also of Bradford, linking to our equality and diversity driver. Children will understand where the ingredients for spiced food comes from, understanding food miles.</p>
	<p>Why now?</p> <p>This builds on learning in EY where children visited the allotment to find out where fruit and vegetables could be grown. Children will have tasted food and have sliced soft fruit. These skills are built on by combining more food elements and preparation techniques such as buttering, slicing and grating.</p>	<p>Why now?</p> <p>Following on from learning in Y1 where children assembled foods to make sandwiches, in this unit they will need to measure quantities to add complexity. They will make decisions about what to include and further develop their cutting and slicing skills when encountering different fruits. This will prepare them for designing healthy breakfast bars in Y3.</p>	<p>Why now?</p> <p>Designing and making a range of mechanical systems provides a deeper of understanding of mechanisms. This unit builds upon knowledge of combining and joining mixed materials during the Year 1 'Rotary mechanisms: windmills' unit. Teachers can amplify this unit to choose different contexts developing design skills and</p>	<p>Why now?</p> <p>This unit of food making adds complexity from previous units as there are more steps needed to prepare and cook the food. Children will follow a recipe, scaling up to make the recipe for more people, bringing in maths skills.</p>	<p>Why now?</p> <p>Building on the cooking unit from Y4, children will incorporate further ingredients in a savoury main meal, making decisions about which elements to include and how much. Using ratio to scale up, children will also use the hob whilst being supervised, adjusting the temperatures as needed.</p>	<p>Why now?</p> <p>This builds on previous learning where children prepared a chili. This time, children will prepare a wider range of ingredients including spices, making decisions about which ones to include and taking very careful measurements, including teaspoons.</p>

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				knowledge within the concept of pneumatics. The technical knowledge can be applied in the Year 4 'Levers and linkages' unit and materials knowledge is built upon within the Year 4 'Simple programming and control: light display' unit.			
AU2	<p>Nursery</p> <p>Uses a glue stick to join materials together.</p> <p>Create an independent craft using available materials e.g. An independent Christmas Card</p> <p>Reception</p> <p>Learn about arts and crafts from different countries - Diwali lamps, Christmas cards, Hanukah cards, Rangoli</p>	<p>FRAME STRUCTURES- BRIDGES</p> <p>NC: Make -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</p> <p>Skills (CQ) Materials -Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products. -Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). -Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). -Cut materials safely using tools provided</p> <p>Evaluate -Suggest improvements to existing designs.</p> <p>Take inspiration -Explore objects and designs to identify likes and dislikes of the designs.</p>	<p>LEVERS AND SLIDES – MOVING CARDS</p> <p>NC: Technical knowledge -explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</p> <p>Evaluate -explore and evaluate a range of existing products</p> <p>Design -design purposeful, functional, appealing products for themselves and other users based on design criteria -generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p> <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Design products that have a clear purpose and an intended user. <p>Take inspiration from design throughout history</p> <ul style="list-style-type: none"> • Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created. <p>Skills (CQ) Materials -Cut materials safely using tools provided. • Measure and mark out to the nearest centimetre.</p>	<p>(Topic Name) NC: (link to National Curriculum)</p> <p>Skills (CQ) I can statements from skills progression</p>	<p>LEVERS AND LINKAGES – INTERACTIVE BOOKS</p> <p>NC:</p> <p>Mechanics Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, gears winding mechanisms and pulleys)</p> <p>Design -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p> <p>Technical knowledge -understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</p> <p>Skills (CQ) Materials • Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Mechanics Use scientific knowledge of the transference of forces to choose appropriate</p>	<p>CAD STRUCTURES - ARCHITECTURE</p> <p>NC:</p> <p>Design - generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Evaluate -investigate and analyse a range of existing products -evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>Skills (CQ) Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. • Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). 	<p>CAMS: AUTOMATA</p> <p>NC:</p> <p>Design - generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Make -select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>Technical knowledge -apply their understanding of how to strengthen, stiffen and reinforce more complex structures -understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</p> <p>Skills (CQ)</p> <p>Construction -Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).</p> <p>Mechanics • Convert rotary motion to linear using cams.</p> <p>Materials Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape).</p>

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			<ul style="list-style-type: none"> • Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). <p>Mechanics</p> <ul style="list-style-type: none"> • Create products using levers, wheels and winding mechanisms. 		<p>mechanisms for a product (such as levers, gears winding mechanisms and pulleys)</p> <p>Design, make, evaluate and improve:</p> <p>-Design with purpose by identifying opportunities to design.</p> <ul style="list-style-type: none"> • Make products by working efficiently (such as by carefully selecting materials). 		<ul style="list-style-type: none"> • Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper).
		<p>Why? This unit introduces pupils to structures. It focuses on bridge building and introduces cutting, folding, and joining techniques. Pupils make their own bridges, applying their knowledge of structure design.</p>	<p>Why? This unit develops pupils' knowledge of simple mechanisms. By making levers and sliders, pupils will apply their knowledge of the characteristics of paper and card to make their own moving cards.</p>	<p>Why? (Why do this topic at all?)</p>	<p>Why? This unit develops pupils' knowledge of mechanisms through levers and linkages. They will apply this knowledge by exploring mechanisms and incorporating them into an interactive book with a user-centred focus.</p>	<p>Why? This unit introduces 3D Computer Aided Design to pupils. They will investigate modern architects to understand the techniques and materials they use in sustainable housing. They will develop knowledge of TinkerCAD to design and present a model sustainable house.</p>	<p>Why? This unit develops pupils' knowledge of mechanisms through cams. Pupils will develop knowledge of the properties of wood and apply this by selecting suitable materials for functionality. Knowledge of wood construction and joining techniques are introduced and applied through making an automaton.</p>
		<p>Why now? Foundation knowledge of structures and how to make them is fundamental to Key Stage 1. This unit builds upon the knowledge of structures from the Early Years Foundation Stage. By introducing cutting, folding, and joining techniques, pupils can access the subsequent curriculum. This unit provides key knowledge for future structure units on 'Levers and sliders: moving cards' and 'Freestanding structures: playgrounds'.</p>	<p>Why now? Developing knowledge of how to make things move using levers and sliders is a foundation of Key Stage 1. Cutting and folding card effectively and safely when creating simple mechanisms is also essential knowledge. This unit uses knowledge of folding and joining techniques developed in the Year 1 'Frame structures: bridges' unit. This unit is a precursor to the Year 4 'Levers and linkages: interactive books' unit.</p>	<p>Why now? (Why do this topic now in the child's educational journey?)</p>	<p>Why now? Identifying mechanical systems and relating these to authentic real life products is essential for pupils to be able to design and make their own systems. This unit builds upon the Year 2 'Levers and sliders: moving cards' unit and teaches pupils the knowledge and science within more complicated levers and linkages. The mechanical system knowledge learnt in this unit is further developed in the Year 6 'Cams: automata' unit.</p>	<p>Why now? Understanding how to use various Computer Aided Design applications widens a designer's knowledge, allowing them to use the correct tools for the proper purpose. Pupils will have used Computer Aided Design in the previous Year 5 unit, 'Using CAD in textiles: pattern design'. This unit introduces 3D modelling and focuses on designing digital solutions while building on Key Stage 1 sustainability design units. Pupils' knowledge of architectural design to inspire pupil work will be developed, supporting the Year 6 'Products and people: inspirational design' unit.</p>	<p>Why now? Pupils will apply their knowledge and understanding of mechanisms learnt throughout Key Stage 1 and 2 to make an automata. Pupils' knowledge of woods, their properties and joining techniques will be developed further from the Year 5 'Pulleys and gears: electric vehicles' unit.</p>
<p>SP1</p>	<p>Nursery</p> <p>Becoming more confident when drawing e.g. potato people, -</p> <p>Names what they have drawn and draws from memory</p>	<p>ROTARY MECHANISMS - WINDMILLS NC: Technical knowledge -explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. Design</p>	<p>(Topic Name) NC: (link to National Curriculum) Skills (CQ) I can statements from skills progression</p>	<p>SHELL STRUCTURES - PACKAGING NC: Design -use research and develop design criteria to inform the design of innovative, functional, appealing products</p>	<p>DATA LOGGERS – SIMPLE PROGRAMMING AND CONTROL NC: Technical knowledge</p>	<p>(Topic Name) NC: (link to National Curriculum) Skills (CQ) I can statements from skills progression</p>	<p>SYSTEMS AND CONTROLS – SENSOR ALARMS NC: Technical knowledge -understand and use electrical systems in their products [for example, series circuits</p>

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	<p>Adding more to their pictures and creations e.g. pom-poms, glitter</p> <p>Reception</p> <p>Share creative ideas with peers and begin to work together, sharing skills –</p> <p>Construct with a purpose in mind, using a variety of resources</p> <p>Safely construct with a purpose and evaluate my designs</p> <p>Select tools and techniques needed to shape, assemble and join materials I am using and explain the process I have used</p> <p>Return to and build on their previous learning, refining ideas and developing the</p> <p>ability to represent them - Know that different materials can be used to create art</p>	<p>-design purposeful, functional, appealing products for themselves and other users based on design criteria</p> <p>-generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p> <p>Evaluate</p> <p>- evaluate their ideas and products against design criteria</p> <p>Skills (CQ)</p> <p>Mechanics</p> <p>- Create products using levers, wheels and winding mechanisms</p> <p>Design, make, evaluate</p> <p>- Make products, refining the design as work progresses.</p> <p>-generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p>		<p>that are fit for purpose, aimed at particular individuals or groups</p> <p>- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Make</p> <p>-select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</p> <p>Evaluate</p> <p>-investigate and analyse a range of existing products</p> <p>-evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</p> <p>- understand how key events and individuals in design and technology have helped shape the world</p> <p>Skills (CQ)</p> <p>Design, make, evaluate and improve:</p> <p>-Design with purpose by identifying opportunities to design.</p> <ul style="list-style-type: none"> • Make products by working efficiently (such as by carefully selecting materials). • Refine work and techniques as work progresses, continually evaluating the product design. <p>Materials</p> <ul style="list-style-type: none"> • Cut materials accurately and safely by selecting appropriate tools. • Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). • Select appropriate joining techniques. <p>Take inspiration from design throughout history</p>	<p>-understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</p> <p>-apply their understanding of computing to program, monitor and control their products.</p> <p>-understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</p> <p>Skills (CQ)</p> <p>Design, make, evaluate and improve:</p> <p>-Design with purpose by identifying opportunities to design.</p> <ul style="list-style-type: none"> • Use software to design and represent product designs <p>Electronics</p> <ul style="list-style-type: none"> • Create series and parallel circuits 		<p>incorporating switches, bulbs, buzzers and motors]</p> <p>-apply their understanding of computing to program, monitor and control their products.</p> <p>Design</p> <p>-use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p> <p>- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Skills (CQ)</p> <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. <p>Mechanics</p> <ul style="list-style-type: none"> • Use innovative combinations of electronics (or computing) and mechanics in product designs. <p>Electronics</p> <p>-Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips).</p> <p>Computing</p> <p>-Write code to control and monitor models or products.</p>
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				<ul style="list-style-type: none"> • Improve upon existing designs, giving reasons for choices. • Disassemble products to understand how they work. 			
		Why? This unit introduces knowledge of simple rotary mechanisms that create movement. Pupils will investigate how windmills work, consider sail design, and produce a working model that will be tested for stability and movement.	Why? (Why do this topic at all?)	Why? This unit develops pupils' knowledge of shell structures. They will critique the packaging of a given product and investigate the sustainability of materials, to create a new packaging design considering its environmental impact.	Why? This unit develops pupils' knowledge of simple circuits, programming and control. Fault finding of circuits will be introduced. Pupils will learn how to integrate a BBC Micro:bit in a simple circuit and use sensors to program a light display.	Why? (Why do this topic at all?)	Why? This unit develops pupils' programming and control knowledge, with a focus on monitoring. Debugging and troubleshooting will be introduced. Pupils will learn how to integrate a BBC Micro:bit in a product and use sensors to program a light display.
		Why now? Understanding how mechanisms work starts with simple systems. This unit builds upon knowledge of mechanisms creating movement explored through simple construction kits during the Early Years Foundation Stage. Knowledge of axles and sails creating movement is a precursor to knowledge developed within the 'Wheels and axles: vehicles' unit.	Why now? (Why do this topic now in the child's educational journey?)	Why now? Giving pupils the opportunity to design without making allows for a greater focus on the design strategies that can be used. Pupils will apply their knowledge of manipulating and joining card from the Year 2 'Freestanding structures: playgrounds' unit to investigate and develop knowledge of packaging design. They will create their own user centred design and make a prototype and branding for a specific product. The structural knowledge developed within this unit will aid pupils within the Year 5 'Frame structures using 3D CAD: sustainable housing' unit.	Why now? Understanding control systems is fundamental to integrating micro-controllers within products. This unit builds upon the materials knowledge in the Year 2 'Pneumatics: moving toys' unit. Knowledge of simple series circuits and switches will have been developed and can be applied and amplified with the learning of micro-controllers. The knowledge and understanding in this unit is built on further in the Year 6 'Systems and control: sensor alarm' unit.	Why now? (Why do this topic now in the child's educational journey?)	Why now? Micro-controllers are a fundamental aspect of the electrical products we use every day. Pupils will create algorithms that monitor input to control output, building on programming and embedding micro-controllers into designs from the Year 4 'Simple programming and control: light display' unit. The systems and control knowledge gained from this unit will support learning within the Year 9 'Functional prototypes: wearable technology' unit.
SP2	Nursery Using spring loaded scissors to snip, using printing materials in the paint such as sponges and shapes Continues to develop their drawing skill. Reception Design with a purpose in mind and explain the process I have used	(Topic Name) NC: (link to National Curriculum) Skills (CQ) I can statements from skills progression	WHEELS AND AXLES - VEHICLES NC: Make -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics Technical knowledge	(Topic Name) NC: (link to National Curriculum) Skills (CQ) I can statements from skills progression	(Topic Name) NC: (link to National Curriculum) Skills (CQ) I can statements from skills progression	PULLEYS AND GEARS – ELECTRIC VEHICLES NC: Evaluate -investigate and analyse a range of existing products -evaluate their ideas and products against their own design criteria and consider the views of others to improve their work - understand how key events and individuals in design and technology have helped shape the world Make	(Topic Name) NC: (link to National Curriculum) Skills (CQ) I can statements from skills progression

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<p>Make 3D models of my favourite bugs, ensuring that they have the different features</p> <p>Draw an object from careful observation talking about the features that I have included</p> <p>Make props to use in role play and small world play</p> <p>Create collaboratively sharing ideas, resources and skills Use tools and techniques with increased care and precision</p> <p>Mix a range of colours needed for a purpose</p>		<p>-build structures, exploring how they can be made stronger, stiffer and more stable -explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</p> <p>Evaluate -explore and evaluate a range of existing products</p> <p>Skills (CQ) Mechanics</p> <ul style="list-style-type: none"> • Create products using levers, wheels and winding mechanisms. <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Make products, refining the design as work progresses. <p>Materials</p> <p>-Cut materials safely using tools provided.</p> <ul style="list-style-type: none"> • Measure and mark out to the nearest centimetre. • Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen). <p>Construction</p> <p>Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products</p>			<p>-select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately -select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</p> <p>Technical knowledge -apply their understanding of how to strengthen, stiffen and reinforce more complex structures -understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</p> <p>Skills (CQ) Mechanics</p> <ul style="list-style-type: none"> • Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs <p>Take inspiration from design throughout history</p> <p>-Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.</p> <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Make products through stages of prototypes, making continual refinements. 	
	<p>Why? (Why do this topic at all?)</p>	<p>Why? This unit develops pupils' knowledge of wheels and axles. The characteristics of woods will be introduced. Pupils will analyse different vehicles and their structure to design and make their own vehicle.</p>	<p>Why? (Why do this topic at all?)</p>	<p>Why? (Why do this topic at all?)</p>	<p>Why? This unit develops pupils' knowledge of mechanisms through gears and pulleys. By investigating electric vehicles and mechanical and electrical components, pupils will apply their knowledge and understanding by making an electric vehicle.</p>	<p>Why? (Why do this topic at all?)</p>
	<p>Why now? (Why do this topic now in the child's educational journey?)</p>	<p>Why now?</p>	<p>Why now?</p>	<p>Why now?</p>	<p>Why now?</p>	<p>Why now?</p>

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			Knowledge of how wheels and axles create movement is vital to understanding how vehicles work. This unit builds upon the Year 1 'Rotary mechanisms: windmills' unit where simple mechanisms were introduced through the use of an axle and sails. Knowledge of frame structures is introduced and will be further developed within the Year 5 'Pulleys and gears: electric vehicles' unit when they add electrical circuits, reversible switches and pulley systems.	(Why do this topic now in the child's educational journey?)	(Why do this topic now in the child's educational journey?)	Including electrical and mechanical components in products develops pupils' knowledge and understanding of systems. Testing products allow pupils to evaluate and improve their designs. This unit develops pupils' knowledge of electronics from the Year 4 'Simple programming and control: light display' unit. Techniques for making frame structures are developed from the Year 5 'Frame structures using 3D CAD: sustainable housing' unit. Mechanical systems knowledge is further built on in the Year 6 'Cams: automata' unit.	(Why do this topic now in the child's educational journey?)
SU1	<p>Nursery</p> <p>Building using smaller construction kits correctly, uses a range of painting and printing materials to explore form and function</p> <p>Children may create with a friend</p> <p>Reception</p> <p>Create collaboratively sharing ideas, resources and skills</p> <p>Draw with details -Problem solve and reflect on my designs and creations</p> <p>Construct with a purpose - Independently use tools and techniques with increased care and precision</p> <p>Experiment with colour, design, texture, form and function</p>	<p>TEMPLATES FOR TEXTILES – HAND PUPPETS</p> <p>NC: Design -design purposeful, functional, appealing products for themselves and other users based on design criteria</p> <p>Make: -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</p> <p>Skills (CQ) Textiles -Shape textiles using templates -Colour and decorate textiles using a number of techniques • Join textiles using running stitch</p> <p>Materials Cut materials safely using tools provided. Cut</p>	<p>(Topic Name) NC: (link to National Curriculum)</p> <p>Skills (CQ) I can statements from skills progression</p>	<p>2D SHAPES TO 3D PRODUCTS – STATIONERY STORAGE</p> <p>NC:</p> <p>Make -select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately -select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</p> <p>Skills (CQ) Textiles • Join textiles with appropriate stitching. • Understand the need for a seam allowance • Select the most appropriate techniques to decorate textiles.</p> <p>Design, make, evaluate and improve: -Design with purpose by identifying opportunities to design. -Make products by working efficiently (such as by carefully selecting materials).</p>	<p>CAD TEXTILES – PATTERN DESIGN</p> <p>NC:</p> <p>Technical knowledge -apply their understanding of computing to program, monitor and control their products.</p> <p>Design -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups - generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Skills (CQ) Design, make, evaluate and improve: -Design with purpose by identifying opportunities to design. • Use software to design and represent product designs</p> <p>Take inspiration from design throughout history</p>	<p>COMBINING FABRICS – ACCESSIBLE TEXTILES</p> <p>NC: Design -use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</p> <p>- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Make -select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately -select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</p> <p>Skills (CQ) Design, make, evaluate and improve: • Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).</p>	<p>(Topic Name) NC: (link to National Curriculum)</p> <p>Skills (CQ) I can statements from skills progression</p>

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	<p>materials safely using tools provided.</p> <p><u>Design, make, evaluate and improve:</u></p> <ul style="list-style-type: none"> • Design products that have a clear purpose and an intended user. 			<ul style="list-style-type: none"> • Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs. 	<ul style="list-style-type: none"> • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate. <p><u>Textiles</u> Create objects (such as a cushion) that employ a seam allowance.</p> <ul style="list-style-type: none"> • Join textiles with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration). • Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles (such as a soft decoration for comfort on a cushion). <p><u>Take inspiration from design throughout history</u></p> <ul style="list-style-type: none"> • Create innovative designs that improve upon existing products. • Evaluate the design of products so as to suggest improvements to the user experience. 	
	<p>Why? This unit develops pupils' knowledge of the characteristics of non-woven fabrics and their joining techniques. Pupils analyse the techniques used to make fabric products and then apply this knowledge by designing and making a fabric puppet.</p>	<p>Why? (Why do this topic at all?)</p>	<p>Why? This unit develops pupils' knowledge and joining techniques when working with woven fabrics. Pupils test and select recycled fabric for functionality. They will use templates and decorative techniques to make a stationery storage product.</p>	<p>Why? This unit introduces pupils to Computer Aided Design and how it can be used to produce fabric templates. Pupils will develop knowledge of fabrics and apply this by selecting fabrics for functionality and aesthetics to design a product.</p>	<p>Why? This unit develops pupils' knowledge and 3D joining techniques when working with woven fabrics. Accessible design is introduced by investigating the work of fashion designers. Pupils apply this knowledge and understanding to make and promote an accessible product.</p>	<p>Why? (Why do this topic at all?)</p>
	<p>Why now? Understanding how textile products are assembled builds the foundation for future textile units. Pupils will have explored different fabrics during the Early Years Foundation Stage and have knowledge of some of their properties. Knowledge and skills within this unit focus on non-woven fabrics and simple joining techniques. It lays the foundations for the future textiles unit in '2D shapes</p>	<p>Why now? (Why do this topic now in the child's educational journey?)</p>	<p>Why now? Creating a product for an authentic purpose is a fundamental aspect of design. This unit builds upon the Year 1 'Templates in textiles: puppets' unit where pupils were introduced to the characteristics of non-woven fabrics and joining techniques. Sustainability is promoted as pupils choose to upcycle fabrics to meet a purpose from the design brief. The knowledge of fabric properties and template design is built</p>	<p>Why now? Designers, including fashion designers, use various methods to communicate design ideas, including Computer Aided Design. Computer Aided Design can be used to develop their understanding of the form of textile products while also exploring knowledge of different fabrics. This unit builds upon joining fabric templates knowledge attained within the Year 3 '2D shapes to 3D products: stationery</p>	<p>Why now? Developing empathy for a specific user allows designers to produce products with a user-centred focus. In this unit, pupils build upon knowledge of templates and user-centred design found in the Year 4 'Using CAD in textiles: pattern design' unit and develop a wider range of fabric joining techniques from the Year 3 '2D shapes to 3D products: stationery storage' unit.</p>	<p>Why now? (Why do this topic now in the child's educational journey?)</p>

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		to 3D products: stationery storage'.		upon further in the Year 5 'Using CAD in textiles: pattern design' unit.	storage' unit. This knowledge is developed when designing and making during the Year 5 'Combining fabrics: accessible textiles' unit.		
SU2	<p>Nursery</p> <p>Children cutting with more confidence, children independently creating and making using the ideas they have seen and come up with Children building for a purpose using a range of construction equipment.</p> <p>Children using a range of 'sticking' tools to join their artwork e.g. sellotape, masking tape, PVA glue, and glue stick</p> <p>Reception ELG:</p> <p>Creating with Materials I can.....</p> <p>safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function - share my creations, explaining the process I have used</p>	<p>(Topic Name) NC: (link to National Curriculum)</p> <p>Skills (CQ) I can statements from skills progression</p>	<p>FREESTANDING STRUCTURES - PLAYGROUNDS NC: (link to National Curriculum)</p> <p>Skills (CQ) I can statements from skills progression</p>	<p>FOOD – HEALTHY BREAKFAST BAR & PACKAGING NC: Cooking and nutrition</p> <p>-understand and apply the principles of a healthy and varied diet -understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</p> <p>Skills (CQ) Food</p> <ul style="list-style-type: none"> • Prepare ingredients hygienically using appropriate utensils. • Measure ingredients to the nearest gram accurately. • Follow a recipe. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking). 	<p>(Topic Name) NC: (link to National Curriculum)</p> <p>Skills (CQ) I can statements from skills progression</p>	<p>(Topic Name) NC: (link to National Curriculum)</p> <p>Skills (CQ) I can statements from skills progression</p>	<p>PRODUCTS AND PEOPLE – INSPIRATIONAL DESIGN NC: Evaluate</p> <p>-investigate and analyse a range of existing products -evaluate their ideas and products against their own design criteria and consider the views of others to improve their work - understand how key events and individuals in design and technology have helped shape the world</p> <p>Design</p> <p>-</p> <p>- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</p> <p>Skills (CQ) Take inspiration from design throughout history</p> <p>-Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.</p> <ul style="list-style-type: none"> • Create innovative designs that improve upon existing products. • Evaluate the design of products so as to suggest improvements to the user experience. <p>Design, make, evaluate and improve:</p> <ul style="list-style-type: none"> • Design with the user in mind, motivated by the service a product will offer (rather than simply for profit). • Make products through stages of prototypes, making continual refinements. • Ensure products have a high quality finish, using art skills where appropriate.

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							<ul style="list-style-type: none"> • Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.
		<p>Why? (Why do this topic at all?)</p>	<p>Why? This unit develops pupils' knowledge of freestanding structures and how to make them more stable. Pupils will analyse different structures, shapes and construction techniques to make piece of play equipment.</p>	<p>Why? As part of learning about healthy, balanced diets, children will learn about different ingredients and the benefits they bring, making decisions about what to include and why.</p>	<p>Why? (Why do this topic at all?)</p>	<p>Why? (Why do this topic at all?)</p>	<p>Why? This unit introduces pupils to key individuals and products from the product design and fashion industries that have shaped our world. Pupils will complete design tasks that develop their knowledge and understanding of designers and their products while critiquing the materials and techniques used.</p>
		<p>Why now? (Why do this topic now in the child's educational journey?)</p>	<p>Why now? Designers can identify solutions to design problems through inspiration of structures in the environment that surrounds them. Pupils will be familiar with the context of playgrounds in the community and potentially within the school setting and will have developed knowledge of structures through the Year 1 'Structures: bridges' unit. This unit will be the foundation for prototyping that is further explored in the Year 3 'Shell structures: packaging' unit.</p>	<p>Why now? Children started to measure ingredients in Year 2. They will practise this further, altering quantities to adapt to taste and based on knowledge of health benefits for each ingredient. This unit also adds challenge as children will be asked to market their product, thinking about what makes it healthy for breakfast.</p>	<p>Why now? (Why do this topic now in the child's educational journey?)</p>	<p>Why now? (Why do this topic now in the child's educational journey?)</p>	<p>Why now? Understanding how key events and individuals in design and technology have helped shape the world inspires pupils when designing and making. This unit builds upon the knowledge of materials and designers throughout the primary curriculum. It is designed to bridge the Key Stage 2 to Key Stage 3 transition and ensure fundamental knowledge and vocabulary are directly correlated to units in Key Stage 3.</p>