Foston CE, Terrington CE VA & Stillington Primary Schools in Collaboration with Langton Primary School Progression Map

Subject: Design and Technology

Key Concepts:

Textiles
Structures
Mechanisms and Mechanical Systems
Food
Electrical Systems

Subject Intent:

- A Children to use creativity to design and make products within a variety of contexts and act as responsible designers
- We aim to create strong cross-curricular links with other subjects, such as, maths, science, computing and art
- We want Design and Technology to prepare our children, give them equal opportunities, responsibilities, and experiences to build upon in later life
- Children to critically evaluate their own products and suggest improvements for future, considering their own and others' responses

Curriculum Enhancers:
Sustainability
Creativity
Diversity
Community

Langton Primary School Values: Excellence, Respect, Nurture, Collaboration, Creativity and Resilience

Teaching Sequence for Design Technology – Projects on Page

Session 1	Sessions 2,3,4	Session 5
Investigate and Evaluate Activities Lesson Children investigate and explore existing products matched to the design brief.	**Focused Tasks** Model the sequence of learning needed in order to reach the final result. Children to practice all the skills needed for the design brief across these sessions. Children explore and experiment with the techniques, evaluating any adaptations need in order to improvement which can then be applied on the DT Day.	**Design, Make and Evaluate Assignment** Full DT Day for children to design, make and evaluate their products based on the design brief.

Key Concepts	Overview	EYFS	Key Stage 1	Key Stage 2	
Textiles	Topic	**Experimenting with Clay** *(Celebrations)* **Basic Stiches** *(Under the Sea)*	**Templates and Joining** *(Habitats in our World)*	**2D and 3D shapes using CAD** *(What was life like before roman Britain?)*	**Combining different fabrics** (using CAD) *(How does migration affect people and places?)*
	Objectives NC	EYFS • Explore, use and refine a variety of artistic effects to express their ideas and feelings. • Return to and build on their previous learning,	KS1 Design • Design purposeful, functional, appealing products for themselves and other users based on design criteria • Generate, develop, model and	KS2 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 group.	

		refining ideas and developing their ability to represent them.	communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology <u>Make</u> • 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 textiles according to their characteristics. <u>Evaluate</u> • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria	• Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. <u>Make</u> • 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 materials, according to their functional properties ana aesthetic qualities <u>Evaluate</u> • 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.	
	Milestones		Y1/Y2: <u>Textiles and Materials</u> • 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). •Cut materials safely using tools provided •Measure and mark out to the nearest centimetre •Demonstrate a range of cutting, shaping and joining	Y3/Y4 <u>Textiles and Materials</u> • Cut materials accurately and safely by selecting appropriate tools. • Measure and mark out to the nearest millimetre. • Select appropriate joining techniques. • Understand the need for a seam allowance. • Join textiles with appropriate stitching. • Select the most appropriate techniques to decorate textiles.	Y5/Y6 <u>Textiles and Materials</u> • 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). • 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). • Create objects (such as a

			techniques. <u>Design, Make and Evaluate</u> • Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Explore objects and designs to identify likes and dislikes of the designs • Suggest improvements to existing designs • Explore how products have been created	<u>Design, Make and Evaluate</u> • 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. • 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.	cushion) that employ a seam allowance. • 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). <u>Design, Make and Evaluate</u> • 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. • 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.
	What could children	1.Make a **Diva Lamp** 2.Make a soft toy **fish**	Design, make and evaluate an **animal glove puppet…**	Design, make and evaluate a **purse/wallet…**	Design, make and evaluate a **reusable shopping bag…**

	design, make and evaluate?	**3.** Make a **Clay Menorah**			
	Intended users (children choose one user)	1.For H**indu Families** 2. for **Themselves** 3. For **Jewish Families**	For **1.Baby** **2.Themselves** **3.Grandparents**	For **1.Child** **2.Parent** **3.Grandparents**	For **1.Teenagers** **2.Themselves** **3.Grandparents**
	Purpose of product	1. **Celebrate Hindu festival of light** 2. **As a toy to play with** 3. **Celebrate Hanukkah**	…for **imaginary role play story about an animal habitat.**	…to **carry Celtic Coins.**	…to **carry shopping from the shops to home.**
	Key Learning	• Explore and use different fabrics. • Cut and join fabrics with simple techniques. • Think about the user and purpose of products.	Prior learning • Explored and used different fabrics. • Cut and joined fabrics with simple techniques. • Thought about the user and purpose of products. Designing • Design a functional and appealing product for a chosen user and purpose based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology. Making • Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. • Select from and use textiles according to their characteristics. Evaluating • Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout	Prior learning • Have joined fabric in simple ways by gluing and stitching. • Have used simple patterns and templates for marking out. • Have evaluated a range of textile products. Designing • Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Produce annotated sketches, prototypes, final product sketches and pattern pieces. Making • Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern. Evaluating • Investigate a range of 3-D textile products relevant to the project.	Prior learning • Experience of basic stitching, joining textiles and finishing techniques. • Experience of making and using simple pattern pieces. Designing • Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computeraided design. • Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. Making • Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work

			and their final products against original design criteria.	• Test their product against the original design criteria and with the intended user. • Take into account others' views. • Understand how a key event/individual has influenced the development of the chosen product and/or fabric.	within the constraints of time, resources and cost. Evaluating • Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.
	Knowledge	<u>Knowledge</u> • To explore different textures, investigating how to use them.	<u>Technical knowledge and understanding</u> • Understand how simple 3-D textile products are made, using a template to create two identical shapes. • Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • Know how to strengthen, stiffen and reinforce existing fabrics. • Understand how to securely join two pieces of fabric together. • Understand the need for patterns and seam allowances. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.
	Vocabulary	Clay, moulding, texturizing, hand building, throwing	Gluing, stapling, safety pins, pinning, sewing, puppets, template, pattern pieces, mark out decorate, join, finish	seam, seam allowance, reinforce, hem, template, pattern piece, pins, needs, thread, pinking shears, fastenings, iron transfer paper.	
<u>Structures</u>	**Topic**	**Building Habitats** *(Habitats)*	**Free Standing Structures** (*London's Burning)*	**Shell structures using CAD to include 1 lesson)** ***(?)***	**Frame Structures** (Shell structures using CAD to include 1 lesson) *(What are the world's natural resources?)*
	Objectives NC	• Explore, use and refine a variety of artistic effects	KS1 <u>Design</u>	KS2 <u>Design</u>	

		to express their ideas and feelings. • Return to and build on their previous learning, refining ideas and developing their ability to represent them.	• 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 <u>Make</u> • 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 according to their characteristics. <u>Evaluate</u> • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria <u>Technical Knowledge</u> • Build structures, exploring how they can be made stronger, stiffer and more stable.	• 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 group. • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. <u>Make</u> • 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 materials, according to their functional properties ana aesthetic qualities <u>Evaluate</u> • 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. <u>Technical Knowledge</u> • Apply their understanding of how to strengthen, stiffen and reinforce more complex Structure.	
	Milestones		Y1/2 <u>Construction</u> •Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products.	Y3/Y4 <u>Construction</u> • Choose suitable techniques to construct products or to repair items.	Y5/Y6 <u>Construction</u> • Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing,

			Design, Make and Evaluate • Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Explore objects and designs to identify likes and dislikes of the designs • Suggest improvements to existing designs • Explore how products have been created.	• Strengthen materials using suitable techniques. Design, Make and Evaluate • 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. • 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.	filing and sanding). • 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.
	What could children design, make and evaluate?	1.Make a **Igloo** using junk modelling 2.Make a **woodland** using small world loose parts	Design, make and evaluate a **miniature prototype Tudor house**	Design, make and evaluate a **money box**	Design, make and evaluate a **prototype tent**
	Intended users (children choose one user)	1.For **animals in the polar reigns** 2.For **animals in the woodlands**	For **1. Teenagers** **2. Younger Children** **3. Adults**	For **1.Themselves** **2. Young children** **3. Peers**	For **1. Local community - Elderly** **2.Bird Watcher - Children** **3.Mountaineers - Adults**
	Purpose of product		…to **make a Tudor house from the Great Fire of London to**	…to **collect money.**	…to **protect people from the weather.**

			inform schools/museums/general public.		
	Key Learning	• Experience of using construction kits to build walls, towers and frameworks. • Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card. • Experience of different methods of joining card and paper.	Prior learning • Experience of using construction kits to build walls, towers and frameworks. • Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card. • Experience of different methods of joining card and paper. Designing • Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings. Making • Plan by suggesting what to do next. • Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating. Evaluating • Explore a range of existing freestanding structures in the	Prior learning • Experience of using different joining, cutting and finishing techniques with paper and card. • A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science. Designing • Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. • Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas. Making • Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use finishing techniques suitable	Prior learning • Experience of using measuring, marking out, cutting, joining, shaping and finishing techniques with construction materials. • Basic understanding of what structures are and how they can be made stronger, stiffer and more stable. Designing • Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. Making • Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make

			school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.	for the product they are creating. Evaluating • Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.	frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making. <u>Evaluating</u> • Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures.
	Knowledge	<u>Knowledge</u> • To explore and investigate what structures are.	<u>Technical knowledge and understanding</u> • Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • Develop and use knowledge of how to construct strong, stiff shell structures. • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Know and use technical vocabulary relevant to the project	<u>Technical knowledge and understanding</u> • Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.
	Vocabulary	Build, construct, blocks, natural materials, design.	Cut, fold, join, fix, structure, wall, tower, framework, weak, strong, base, top, surface, thinner, thicker, wood, cuboid, cylinder, cube	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity	Frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent

Mechanisms and Mechanical Systems	**Topic**		**Sliders and Leavers** (*How have peoples lives changed)*	**Levers and Linkages** *(What was life like in Ancient Egypt?)*	**Pulley's or Gears** (*Our Marvelous Earth)*
	Objectives NC		KS1 <u>Design</u> • 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 <u>Make</u> • 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 according to their characteristics <u>Evaluate</u> • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria <u>Technical Knowledge</u> • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their Products.	KS2 • 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 group. • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. • 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, according to their functional properties ana aesthetic qualities • 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. • Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • Apply their understanding of computing to program, monitor and control their products	
	Milestones		Y1/Y2: <u>Mechanics</u>	Y3/Y4	Y5/Y6 • Convert rotary motion to

			• Create products using levers, wheels and winding mechanisms <u>Design, make and evaluate</u> • Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Explore objects and designs to identify likes and dislikes of the designs • Suggest improvements to existing designs • Explore how products have been created	• Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs.
	What could children design, make and evaluate?		Design, make and evaluate **a Thank you Card**	Design, make and evaluate **a Thank you Card**	Design, make and evaluate **a Thank you Card**
	Intended users (children choose one user)		For **1. School Visitor** **2. Friend** **3. Parents**	For **1. Younger children** **2. Peers** **3. Grandparents**	For **1. Adults** **2. Teenager** **3. Younger Children**
	Purpose of product		…a **Thank you card with moving parts highlighting the change through time of card making.**	…to inform others of **Ancient Egypt.**	…for **entertainment.**
	Key Learning		<u>Prior learning</u> • Early experiences of working with paper and card to make simple flaps and hinges. • Experience of simple cutting, shaping and joining skills using scissors, glue, paper fasteners and masking tape. <u>Designing</u> • Generate ideas based on simple design criteria and their	<u>Prior learning</u> • Explored and used mechanisms such as flaps, sliders and levers. • Gained experience of basic cutting, joining and finishing techniques with paper and card. <u>Designing</u> • Generate realistic ideas and their own design criteria through discussion, focusing	<u>Prior learning</u> • Experience of axles, axle holders and wheels that are fixed or free moving. • Basic understanding of electrical circuits, simple switches and components. • Experience of cutting and joining techniques with a range of materials including card, plastic and wood.

			own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper. <u>Making</u> • Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating. <u>Evaluating</u> • Explore a range of existing books and everyday products that use simple sliders and levers. • Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria	on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas. <u>Making</u> • Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. • Select from and use finishing techniques suitable for the product they are creating. <u>Evaluating</u> • Investigate and analyse books and, where available, other products with lever and linkage mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make	• An understanding of how to strengthen and stiffen structures. <u>Designing</u> • Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views. <u>Making</u> • Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • 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. <u>Evaluating</u> • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work.

					• Investigate famous manufacturing and engineering companies relevant to the project.
	Knowledge		<u>Technical knowledge and understanding</u> • Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • Understand that mechanical and electrical systems have an input, process and an output. • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know and use technical vocabulary relevant to the project.
	Vocabulary		slider, lever, pivot, slot, bridge/guide card, masking tape, paper fastener, join pull, push, up, down, straight, curve, forwards, backwards.	Mechanism, lever, linkage, pivot, slot, bridge, guide.	Pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor.
<u>Mechanisms and Mechanical Systems</u>	**Topic**		**Wheels and Axles** (People Who Help Us*)*	**Pneumatics** *(What was it like in Ancient Greece?)*	**CAMS** *(What is it like in space?)*
	Objectives NC		KS1 <u>Design</u> • 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 <u>Make</u> • Select from and use a range of	KS2 • 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 • 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	

			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 according to their characteristics <u>Evaluate</u> • Explore and evaluate a range of existing products • Evaluate their ideas and products against design criteria <u>Technical Knowledge</u> • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their Products.	materials, textiles and ingredients, according to their functional properties and aesthetic qualities • 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 • Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	
	Milestones		Y1/Y2: <u>Mechanics</u> • Create products using levers, wheels and winding mechanisms. <u>Design, make and evaluate</u> • Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Explore objects and designs to identify likes and dislikes of the designs • Suggest improvements to existing designs • Explore how products have been created	Y3/Y4 •Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears). •	Y5/Y6: • Convert rotary motion to linear using cams. • Use innovative combinations of electronics (or computing) and mechanics in product designs • 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. • Create innovative designs that improve upon existing products. • Evaluate the design of products

					so as to suggest improvements to the user experience
	What could children design, make and evaluate?		Design, make and evaluate **a push and pull emergency service toy vehicle.**	Design, make and evaluate **a jack-in-a-box with a famous figure or landmark of Ancient Greece (possibility to use recycled cardboard?)**	Design, make and evaluate **a Shop Display displaying moving parts – space/planet theme**
	Intended users (children choose one user)		For **1. Friends** **2. Young Children** **3. Themselves**	For **1. Adult Visitors to schools** **2. Children in a Museum** **3.**	For **1. Children** **2. Adults** **3. Astronomers**
	Purpose of product		…to make a **people who help us toy car.**	…an **interest and hobbies**	…**an interest and hobbies**
	Key Learning		<u>Prior learning</u> • Assembled vehicles with moving wheels using construction kits. • Explored moving vehicles through play. • Gained some experience of designing, making and evaluating products for a specified user and purpose. • Developed some cutting, joining and finishing skills with card. <u>Designing</u> • Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups. <u>Making</u> •Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement	<u>Prior learning</u> • Explored simple mechanisms, such as sliders and levers, and simple structures. • Learnt how materials can be joined to allow movement. • Joined and combined materials using simple tools and techniques. <u>Designing</u> • Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas. <u>Making</u> • Order the main stages of making. • Select from and use appropriate tools with some	<u>Prior learning</u> • Experience of axles, axle holders and wheels that are fixed or free moving. • Basic understanding of different types of movement. • Experience of cutting and joining techniques with a range of materials including card, plastic and wood. • An understanding of how to strengthen and stiffen structures. <u>Designing</u> • Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from

			and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics. <u>Evaluating</u> • Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria.	accuracy to cut and join materials and components such as tubing, syringes and balloons. • Select from and use finishing techniques suitable for the product they are creating. <u>Evaluating</u> • Investigate and analyse books, videos and products with pneumatic mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.	different views. <u>Making</u> • Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • 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. <u>Evaluating</u> • Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing an
	Knowledge		<u>Technical knowledge and understanding</u> • Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project	<u>Technical knowledge and understanding</u> • Understand and use pneumatic mechanisms. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • Understand that mechanical systems have an input, process and an output. • Understand how cams can be used to produce different types of movement and change the direction of movement. • Know and use technical vocabulary relevant to the project.

	Vocabulary		Vehicles, wheel, axle, axle holder, chassis, body, cab, assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism.	pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight	cam, snail cam, off-centre cam, peg cam, pear shaped cam follower, axle, shaft, crank, handle, housing, framework rotation, rotary motion, oscillating motion, reciprocating motion
Food	Topic	**Healthy Eating** *(Growing)*	**Preparing Fruit and Veg** *(What is Special about our local area?)*	**Healthy and Varied Diets** *(Why does the UK have wild weather)*	**Celebrating Seasonality** *(Who were the Vikings and Anglo Saxons?)*
	Objectives NC	R: •Manage their own personal needs: personal hygiene •Know and talk about the different factors that support their overall health and wellbeing: -healthy eating.	KS1 <u>Design</u> • 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 <u>Make</u> • 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 ingredients according to their characteristics. <u>Evaluate</u> • Explore and evaluate a range of existing products	KS2 • 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.	

			• Evaluate their ideas and products against design criteria <u>Technical Knowledge</u> • Use basic principles of a healthy and varied diet to prepare dishes •Understand where food comes from.		
	Milestones		Y1/Y2: <u>Food</u> • Cut, peel or grate ingredients safely and hygienically. • Measure or weigh using measuring cups or electronic scales. • Assemble or cook ingredients. <u>Design, make and evaluate</u> • Design products that have a clear purpose and an intended user. • Make products, refining the design as work progresses. • Explore objects and designs to identify likes and dislikes of the designs. • Suggest improvements to existing designs. • Explore how products have been created.	Y3/Y4 •Prepare ingredients hygienically using appropriate utensils • Measure ingredients to the nearest gram accurately. • Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).	Y5/Y6 • Understanding the importance of correct storage and handling of ingredients (using knowledge of micro-organisms) • Measure accurately and calculate ratio of ingredients to scale up or down from a recipe. • Demonstrate a range of backing and cooking techniques. • Create and refine recipes, including ingredients, methos, cooking times and temperatures.
	What could children design, make and evaluate?	Design, make and evaluate a **Fruit Salad**	Design, make and evaluate **a fruit smoothie**	Design, make and evaluate a **pitta pockets.**	Design, make and evaluate **Anglo Saxon Bread.**
	Intended users (children choose one user)	For **1.Themselves** **2.Parents**	For **1. Older Children** **2. Young Children** **3. Peers at School**	For **1.Themselves** **2.Young Children** **3.Parents**	For **1. Themselves** **2. Adults** **3. Young Children**

	Purpose of product		…for **A Community Party celebrating the local area.**	…for a **Picnic.**	…for an **Anglo-Saxon festival.**
	Key Learning	• Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell. • Experience of cutting soft fruit and vegetables using appropriate utensils.	<u>Prior learning</u> • Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell. • Experience of cutting soft fruit and vegetables using appropriate utensils. <u>Designing</u> • Design appealing products for a particular user based on simple design criteria. • Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. • Communicate these ideas through talk and drawings. <u>Making</u> • Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. • Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. <u>Evaluating</u> • Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria, including intended user and purpose	<u>Prior learning</u> • Know some ways to prepare ingredients safely and hygienically. • Have some basic knowledge and understanding about healthy eating and The eatwell plate. • Have used some equipment and utensils and prepared and combined ingredients to make a product. <u>Designing</u> • 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. • Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas. <u>Making</u> • Plan the main stages of a recipe, listing ingredients, utensils and equipment. • Select and use appropriate utensils and equipment to prepare and combine ingredients.	<u>Prior learning</u> • Have knowledge and understanding about food hygiene, nutrition, healthy eating and a varied diet. • Be able to use appropriate equipment and utensils, and apply a range of techniques for measuring out, preparing and combining ingredients. <u>Designing</u> • Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas. Making • Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present

				• Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics. Evaluating • Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.	the food product appropriately for the intended user and purpose. Evaluating • Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets.
	Knowledge	•To explore different fruit and vegetables • To begin to understand what is healthy snack	Technical knowledge and understanding • Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. • Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The eatwell plate. • Know and use technical and sensory vocabulary relevant to the project.	Technical knowledge and understanding • Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately.	Technical knowledge and understanding • Know how to use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary.
	Vocabulary	Fruit, taste, smell, texture, cutting, choosing, healthy.	chopping boards, knives, peelers, graters, skewers, juicers, spoons, jugs, plates,	Texture, taste, sweet, sour, appearance, smell, preference, greasy, moist,	Ingredients, yeast, dough, flour, wholemeal, baking soda, fat, sugar, carbohydrate,

			bowls, aprons, soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard, flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting.	cook, fresh, savoury, seasonal, harvested, healthy/varied diet, grown.	protein, vitamins, nutrients, dairy, allergy, intolerance, savoury, source, seasonality, pour, mix, rubbing in, whisking, beat, roll out, sprinkle, combine, crumble.
Electrical Systems	Topic	**Taking photographs - portraits** *(People Who Help Us)*		**Simple Circuits and Switches** *(World War 1 Conflicts)*	**More Complex Switches and Circuits** *(What are the countries of Europe)*
	Objectives NC	•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.		•Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] •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 • 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 •generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	
	Milestones			Y3/Y4 • create a series and parallel circuits	Y5/Y6 • create circuits using electronic kits that employ a number of components (such as LEDs, resistors, transistors and chips).

	What could children design, make and evaluate?	To take a **portrait of someone who helps them**		Design, make and evaluate a **torch**	Design, make and evaluate a **security lighting system**
	Intended users (children choose one user)	For a **class gallery.**		For **1. Young Children** **2. Teenagers** **3. Grandparents**	For **1. School Community: Children** **2. Parents** **3. Grandparents**
	Purpose of product			…for **safety during the blackout in WW1.**	…for **security for your home.**
	Key Learning	•Experience of using cameras and iPads to take photographs		<u>Prior learning</u> • Constructed a simple series electrical circuit in science, using bulbs, switches and buzzers. • Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue. <u>Designing</u> • 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. • Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. <u>Making</u> • Order the main stages of making. • Select from and use tools	<u>Prior learning</u> • Understanding of the essential characteristics of a series circuit and experience of creating a battery powered, functional, electrical product. • Initial experience of using computer control software and an interface box or a standalone box, e.g. writing and modifying a program to make a light flash on and off. <u>Making</u> • Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. <u>Evaluating</u>

				and equipment to cut, shape, join and finish with some accuracy. • Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities. <u>Evaluating</u> • Investigate and analyse a range of existing battery-powered products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.	• Continually evaluate and modify the working features of the product to match the initial design specification. • Test the system to demonstrate its effectiveness for the intended user and purpose. • Investigate famous inventors who developed ground-breaking electrical systems and components.
	Knowledge	•To explore modern technology to take photographs		<u>Technical knowledge and understanding</u> • Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Apply their understanding of computing to program and control their products. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • Understand and use electrical systems in their products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.
	Vocabulary	Portrait, camera, photograph, gallery.		series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator,	series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart

				conductor, crocodile clip control, program, system, input device, output device	

KS2 DT Day Simple Programming and Control

Electrical Systems	Topic	**DT DAY** **Simple Programming and Control** *(What is globalisation?)*	**DT DAY** **Monitoring and Control** *(What is globalisation?)*
	Objectives NC	•Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] •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 • 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 •generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	
	Milestones	Y3/Y4 • Create series and parallel circuits	Y5/Y6 • Create circuits using electronics kits that employ a number of components (such as LEDs, resistors, transistors and chips)

	What could children design, make and evaluate?	Design, make and evaluate a **night light**	Design, make and evaluate a **automatic night light**
	Intended users (children choose one user)	For **1. Babies** **2. Young Children** **3. Grandparents**	For **1. Babies** **2. Young Children** **3. Grandparents**
	Purpose of product	…for **safety during the night.**	…for **safety during the night.**
	Key Learning	<u>Prior learning</u> • Constructed a simple series electrical circuit, using bulbs, batteries, switches and buzzers. • Cut and joined a variety of construction materials, such as wood, card, plastic, reclaimed materials and glue. <u>Designing</u> • Gather information about users' needs and wants, and develop design criteria to inform the design of products that are fit for purpose. • Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. <u>Making</u> • Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. • Create and modify a computer control program to enable their electrical product to respond to changes in the environment. <u>Evaluating</u> • Continually evaluate and modify the working features of the product to match the initial design specification. • Test the system to demonstrate its effectiveness for the intended user and purpose.	<u>Prior learning</u> Initial experience of using computer control software and an interface box, a standalone box or microcontroller, e.g. Crumble. • Some experience of writing and modifying a program to make a light turn on or flash on and off. • Understanding of the essential characteristics of a series circuit and experience of creating a battery powered, functional, electrical product. <u>Designing</u> • Develop a design specification for a functional product that responds automatically to changes in the environment. • Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams. <u>Making</u> • Order the main stages of making. • Select from and use tools and equipment to cut, shape, join and finish with some accuracy. • Connect simple electrical components and a battery in a series circuit to achieve a functional outcome. • Program a standalone control box, microcontroller or interface box to enhance the way the product works. <u>Evaluating</u> • Investigate and analyse a range of existing battery-powered products, including pre-programmed and programmable products. • Evaluate their ideas and products against their own design

			criteria and identify the strengths and areas for improvement in their work.
	Knowledge	<u>Technical knowledge and understanding</u> • Understand and use computing to program and control products containing electrical systems, such as series circuits incorporating switches, bulbs and buzzers. • Know and use technical vocabulary relevant to the project.	<u>Technical knowledge and understanding</u> • Understand and use electrical systems in their products. • Understand the use of computer control systems in products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.
	Vocabulary	Control, program, system, input, device, series, process, series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, light emitting diode (LED), bulb, bulb holder, USB cable, wire, insulator, conductor, crocodile clip	Control, program, system, input, device, series, process circuit, parallel circuit, reed switch, toggle switch, push-to-make switch, push-to-break switch, light dependent resistor (LDR), tilt switch.