Design and Technology Long Term Plan UKS2

Year A			
Topic	Structures	Electrical Systems	Textiles
Relevant area of Programme of study	*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 materials, textiles and ingredients, according to their functional properties and aesthetic qualities *Investigate and analyse a range of existing products	*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 materials, textiles and ingredients, according to their functional properties and aesthetic qualities *Investigate and analyse a range of existing products	*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 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 *Apply their understanding of how to strengthen, stiffen and reinforce more complex structures	*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 electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]	*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.
Vocabulary	Glue, product, materials, drill, screw, nail, strengthen, construct, repair, techniques, cutting, joining, shaping, aesthetic, functional evaluate, saw, vise, measure, permanent, temporary, assemble, components, mark out, accuracy, safety, wood types, 3D, 2D, stable, frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, permanent, research, computer-aided-design, CAD	series circuit, fault, connection, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip, control, program, system, input device, output device, user, purpose, function, design criteria, innovative, bbc micro bit, coding, bluetooth, programming, program	Fabric, names of fabrics, fastening, compartment, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, needle, running stitch, cross stitch, back stitch, chain stitch, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces, sewing machine, tapestries, stitches, hem, edging
Key Knowledge	<u>Design</u>	<u>Design</u>	<u>Design</u> Develop, model and communicate ideas through talking, drawing, templates,

	Carry out research into user needs and existing products using web-based resources and pupil interviews. **Learn about famous inventor / designer / engineer related to topic such as Stephen Sauvestre – a designer of the Eiffel Tower and Thomas Farnolls Pritchard – designer of the Iron Bridge.** Generate, develop and model ideas through computer-aided-design (e.g Sketch Up, Purple Mash, Word, Excel), annotated sketches and exploded diagrams. Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. Produce appropriate lists of tools, equipment and materials they will need Writing down step by step process if applicable <u>Make</u> Competently select from and use appropriate tools to accurately measure (cm and mm), mark out, cut, shape and	Generate and develop innovative ideas and share and clarify these through discussion. **Learn about famous inventor / designer / engineer related to topic project e.g. Thomas Edison – light bulb.** Communicate ideas through annotated sketches, exploded diagrams, CAD, including pictorial representations of electrical circuits or circuit diagrams. Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. <u>Make</u> 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>Evaluate</u>	annotated sketches, exploded diagrams, CAD. **Learn about famous inventor / designer / engineer related to topic e.g. Fiona Fairhurst – Fastskin swimwear designer.** Produce appropriate lists of tools, equipment and materials they will need Writing down step by step process if applicable Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. Investigate and analyse textile products linked to their final product <u>Make</u> Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. Understand and apply edging techniques and hemming.

	join construction materials to make frameworks. Use finishing and decorative techniques suitable for the product they are designing and making Construct products using permanent joining techniques e.g wood glue, glue guns Understand how to strengthen, stiffen and reinforce 3-D frameworks using triangulation. Understanding and using cutting, drilling, screwing and sanding techniques. <u>Evaluate</u> Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development <u>Technical Knowledge</u> Apply their understanding of how to strengthen, stiffen and reinforce more complex structures	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. <u>Technical Knowledge</u> Understand and use electrical systems in their products. -Apply their understanding of computing to program, monitor and control their products.	Produce a textile product from a combination of accurately made pattern pieces, fabric shapes and different fabrics, including the use of a sewing machine and varied stitching techniques. <u>Evaluate</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 <u>Technical Knowledge</u> A 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 A range of stitching techniques including sewing machine
Year B			

Design and Technology Long Term Plan UKS2

Topic	Mechanical Systems (CAMS)	Cooking and Nutrition	
Relevant area of Programme of study	*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 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	*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.	

	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]		
Vocabulary	components, fixing, attaching, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight, purpose, function, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate, cam, axle, handle, housing, exploded diagram, annotated sketch, rotary movement	name of products, names of equipment, utensils, techniques and ingredients, texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury, hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet, planning, design criteria, purpose, user, annotated sketch, sensory evaluations, peeler, recipe, rolling pin, knife, grater, hygienic, safety, cutlery, ingredients, measure, weigh, accuracy, scales, teaspoon, tablespoon	
Key Knowledge	<u>Design</u> Design products using cross section or exploded diagram and communicate ideas to peers and adults	<u>Design</u> Research recipes using the internet and books to help design own recipe	

	Learn about famous inventor / designer / engineer related to topic Mary Anderson – inventor of the windscreen wiper – used her technical knowledge of levers to solve a practical problem. Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. <u>Make</u> Select from and use a range of tools and equipment to make products that are accurately assembled, including a cams movement <u>Evaluate</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, functionality and fitness for purpose. Consider the views of others to improve their work.	Learn about famous inventor / designer / engineer related to topic Generate ideas through brainstorming and discussion with peers Make links to a healthy, balanced diet when choosing ingredients Produce appropriate lists of tools, equipment and materials they will need Writing down step by step process if applicable <u>Make</u> Work out ratios in recipes Weigh and measure ingredients accurately (e.g. dry ingredients and liquids) Make, decorate and present the food product appropriately for the intended user and purpose. Measure, weigh, scale with increased accuracy (grams, kilograms, mililitres, teaspoon tablespoon, ratios Apply the rules for basic food hygiene and other safe practises e.g. hazards relating to the use of ovens	

	Technical Knowledge 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	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 the food product appropriately for the intended user and purpose Evaluate Carry out sensory evaluations of a range of relevant products and ingredients Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. Technical Knowledge 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.	