THE STOKE POGES SCHOOL

Design and Technology Long Term Plan

Year 1 Design and Technology Overview			
Term	**Autumn**	**Spring**	**Summer**
Unit	**Mechanisms – Sliders and Levers**	**Food – Selecting and Preparing Fruit and Vegetables**	**Freestanding Structures**
Final Product	**Card reveal slider**	**Fruit Salad**	**Aeroplane**
Significant Designers	• Various toy companies e.g. Chad Valley • Ole Kirk Kristiansen (founded LEGO Group in 1932)	• Jamie Oliver	• Annie Atkins (Graphic Designer) • Norman Foster (Architect)
Technical Knowledge	• Understand that different mechanisms produce different types of movement • Know and can use technical vocabulary relevant to the project • Understand the steps to make a moving picture or toy • Understand that products are designed for users based on criteria, and what simple criteria for a moving toy could be – the mechanism should work smoothly, it should make the right type of movement	• Know it is important to wash hands before preparing food and also to wash fruit before we eat it • Know simple utensils can be used to process food and make it easier to eat • Know fruit is an essential part of a balanced diet and 5 portions of fruit and veg are recommended per day • Know a fruit usually contains a plant or tree's edible seed • Know a vegetable is a plant used for food • Know a fruit salad is a cold dish of fresh and/or cooked fruit • Understand where a range of fruit and vegetables come from e.g. farmed or grown at home • Understand and use the 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	• Know how to join components together effectively • Know that a range of tools can be used for different purposes: cutting, sticking, curling, bending, joining etc • Know how to make freestanding structures stronger, stiffer and more stable • Know and use technical vocabulary relevant to the project
Key Skills	**Evaluate existing products and designs over time** • Evaluate a range of existing toys and everyday products that use simple sliders and levers **Design** • Suggest ideas and explain what they are going to design and make • Develop, model and communicate their ideas through discussion, observation, drawing, modelling • Identify a purpose and audience **Make**	**Evaluate existing products and designs over time** • Taste and evaluate a range of fruit and vegetables to determine preferences **Design** • Design an appealing fruit salad 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 **Make**	**Evaluate existing products and designs over time** • Evaluate a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings • Explore how products have been created **Design** • Generate ideas based on simple design criteria and their own experiences, explaining what they could make • Explore initial ideas using drawings and mock-ups **Make**

	• Plan by suggesting what to do next • Identify simple design criteria • Begin to select tools and materials; use vocabulary to name and describe them • Cut materials safely using tools provided • Use simple finishing techniques suitable for the product they are creating **Evaluate** • Evaluate their ideas throughout the process and review their products in relation to the purpose and the user and whether it meets design criteria	• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely • Select from a range of fruit and vegetables • Cut or grate fruits safely and hygienically • Identify a purpose for what they intend to design and make e.g. a fruit salad **Evaluate** • Evaluate ideas and finished products against design criteria, including intended user and purpose	• Select and use tools, skills and techniques, explaining their choices • Select new and reclaimed materials and construction kits to build their structures • Make simple drawings and label parts • Demonstrate a range of joining techniques • Use simple finishing techniques suitable for the structure they are creating **Evaluate** • Evaluate their ideas throughout the process and review their products against original criteria • Suggest improvements to existing designs
Vocabulary	Lever, slider, pivot, slot, bridge Card, masking tape, paper fastener, join Push, pull, up, down, straight, curve, forwards, backwards Design, make, evaluate, user, product, ideas, design criteria, product, function	Fruit and vegetable names, names of equipment and utensils Sensory vocabulary e.g. 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, arranging, popular, design, evaluate, criteria	Cut, fold, join, fix Structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved Metal, wood, plastic Circle, triangle, square, rectangle, cuboid, cube, cylinder Design, make evaluate, user, purpose, ideas, design criteria, product, function

THE STOKE POGES SCHOOL

Design and Technology Long Term Plan

		Year 2 Design and Technology Overview	
Term	**Autumn**	**Spring**	**Summer**
Unit	**Mechanisms – Wheels and axles**	**Textiles**	**Food – Healthy and Varied Diet**
Final Product	**Making Vehicles**	**Decorative Bunting**	**Flapjacks**
Significant Designers	• Henry Ford (Mechanical Engineer) • Enzo Ferrari (Automotive designer) • Beatrice Schilling (Aeronautical Engineer and motor racer)	• Paul Smith (Fashion Designer) • Mary Quant (Fashion Designer)	• Mary Berry (Chef)
Technical Knowledge	• Know a mechanism is a device used to create movement in a product and wheels and axles are examples of this • Distinguish between fixed and freely moving axles • Know the purpose of the product (that the finished model can be moved on wheels with ease) • Know what components are needed to construct a moving vehicle and use this to select materials according to which are most suitable • Know and use technical vocabulary relevant to the project	• Know what design criteria is and how it is used to create a product • Know which equipment is needed to sew material together • Know and use key vocabulary, as relevant to the project: seam, thread, stitch • Know how to evaluate their product against the design criteria and suggest improvements	• Know the purpose of different tools and which to select for use in preparing food (e.g. colander, sieve, spatula, peeler) • Know how to wash, peel, slice and grate vegetables, selecting and using appropriate kitchen equipment safely and purposefully • Know how to grow vegetables from seed and prepare for eating (including peeling, chopping, steaming and boiling) • Know that some ingredients are easier to acquire according to the season • Know the food groups that different healthy foods belong to and demonstrate by selecting appropriate combinations for a singular meal • Know the source of their food
Key Skills	**Evaluate existing products and designs over time** • Explore and evaluate a range of products with wheels and axels **Design** • Generate initial ideas and simple design criteria through talking and using own experiences • Develop and communicate ideas through drawings and mock-ups **Make** • Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics	**Evaluate existing products and designs over time** • Understand how simple 3D textile products are made, using a template to create 2 identical shapes **Design** • Design a functional and appealing bunting 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 ICT **Make** • Select from a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing	**Evaluate existing products and designs over time** • Taste and evaluate a range of fruit to determine preferences **Design** • Plan and prepare a dish of nutritional value • Identify a purpose for what they are intending to make • Develop their design ideas applying findings from their earlier research of eating fruits to discover if they like them or not **Make** • Prepare a meal safely, using a range of equipment appropriately • Measure or weigh using measuring cups or electronic scales

	• Use wheels and axles as mechanisms in their product **Evaluate** • Explore and evaluate a range of products with wheels and axles • Evaluate their ideas throughout and their products against original criteria	• Select from and use textiles according to their characteristics • Thread and use a needle safely **Evaluate** • Evaluate own and other's product against the design criteria	• Assemble and cool ingredients • Make and present food in an aesthetically pleasing way and evaluate the success of their own and others' dishes, involving critique of how dishes could be improved • Begin to use and be aware of a range of methods of food preparation, such as peeling, chopping, steaming and boiling **Evaluate** • Suggest improvements to existing designs • Evaluate their success, considering the purpose and audience
Vocabulary	Vehicle, wheel, axle, axle holder, chassis, body, cab Assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism Names of tools, equipment and materials used Design, make, evaluate, purpose, user, criteria, functional	Names of existing products, joining and finishing techniques, tools, fabrics and components Template, pattern pieces, mark out, join, decorate, finish Features, suitable, quality, mock-up, design brief, design criteria, make, evaluate, user, purpose, function	Names of equipment and utensils Sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard Slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria

THE STOKE POGES SCHOOL

Design and Technology Long Term Plan

Year 3 Design and Technology Overview			
Term	**Autumn**	**Spring**	**Summer**
Unit	**Shell Structures**	**Textiles – 2D shape to 3D Product**	**Mechanical Systems – Levers and Linkages**
Final Product	**Gift Box**	**Cushion**	**Moving Mythical Creature**
Significant Designers	• Tiffany & Co – Little blue box	• Suzie Watson (local)	• Archimedes invented the lever
Technical Knowledge	• 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 unit	• Know how to strength, stiffen, and reinforce existing fabrics • Understand how to use simple patterns and templates for marking out • Join fabric in simple ways by gluing and stitching • Understand how to securely join 2 pieces of fabric together • Understand the need for patterns and seam allowance • Know and use technical vocabulary relevant to the unit	• Have experience of basic cutting, joining and finishing techniques • Understand and use lever and linkage mechanisms • Distinguish between fixed and loose pivots • Know and use technical vocabulary relevant to the unit
Key Skills	**Evaluate existing products and designs over time** • Investigate and evaluate a range of existing shell structure including the materials, components and techniques that have been used • Disassemble products to understand how they work **Design** • Generate realistic 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 • Make labelled drawings from different views showing specific features **Make** • Order the main stages of making • Select and use appropriate tools to measure, mark out, score, shape and assembly with some accuracy • Measure and cut out to the nearest mm	**Evaluate existing products and designs over time** • Investigate a range of 3D textile products relevant to the unit **Design** • Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific users • Produce annotated sketches, prototypes, final product sketches and pattern pieces **Make** • Plan the main stages of making • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing • Understand the need for a seam allowance • Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern • **Evaluate**	**Evaluate existing products and designs over time** • Investigate and analyse books and, where available, other products with lever and linkage mechanisms **Design** • Generate ideas from an item, considering its purpose and user • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes • Use annotated sketches and prototypes to develop, model and communicate ideas **Make** • Order the main stages of making • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card • Measure and cut to the nearest mm • Select from and use finishing techniques suitable for the product they are creating **Evaluate**

	• Explain their choice of materials according to functional properties and aesthetic qualities • Use finishing techniques suitable for the product they are creating **Evaluate** • Test and evaluate their own products against design criteria and the intended user and purpose	• Test their product against the original design criteria and with the intended user • Consider others' views • Understand how designers have influenced the development of the chosen product	• Evaluate their own products and ideas against criteria and user needs, as they design and make • Suggest alternative methods of making, if the first attempts fail
Vocabulary	Shell structure, 3-D, shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity Marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating Font, lettering, text, graphics, decision, evaluating, design brief, design criteria, innovative, prototype	Fabric, names of fabrics, fastening, compartment zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance User, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces	Mechanism, lever, linkage, pivot, slot, bridge, guide System, input, process, output Linear, rotary, oscillating, reciprocating User, purpose, function Prototype, design criteria, innovative, appealing, design brief

THE STOKE POGES SCHOOL

Design and Technology Long Term Plan

Year 4 Design and Technology Overview			
Term	**Autumn**	**Spring**	**Summer**
Unit	**Electrical Systems – Simple circuits and Switches**	**Mechanical Systems – Pneumatics**	**Food – Healthy and Varied Diet**
Final Product	**Light Up Cards**	**Moving Trees**	**Making a Healthy Wrap**
Significant Designers	• James Dyson • Thomas Edison (Scientist and Engineer)	• Rosie the Riveter • Isambard Kingdom Brunel	• Nadiya Hussain
Technical Knowledge	• 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 unit	• Understand and use pneumatic mechanisms • Use scientific knowledge of the transference of forces to choose appropriate mechanisms • Know and use technical vocabulary relevant to the unit	• 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
Key Skills	**Evaluate existing products and designs over time** • Investigate and analyse a range of existing battery-powered products • Evaluate products and identify criteria that can be used for their own designs • Disassemble products to understand how they work **Design** • 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 • Make labelled drawings from different views showing specific views **Make** • Order the main stages of making • Select from and use tools 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	**Evaluate existing products and designs over time** • Investigate and analyse books, videos and products with pneumatic mechanisms • Disassemble products to understand how they work **Design** • 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 **Make** • Order the main stages of making • Select from and use appropriate tools with some 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 • Make drawings with labels when designing and making • Measure and cut to the nearest mm **Evaluate**	**Evaluate existing products and designs over time** • Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs **Design** • Generate and clarify ideas through discussions with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and product • Use annotated sketches and appropriate ICT, such as web-based recipes, to develop and communicate ideas **Make** • Plan the main stages of a recipe, listing ingredients, utensils and equipment • Select and use appropriate utensils and equipment to prepare and combine ingredients • Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics • Prepare ingredients hygienically using appropriately • Follow a recipe • Assemble and cook ingredients

	Evaluate • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work	• Evaluate their own products and ideas against criteria and user needs, as they design and make	**Evaluate** • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others
Vocabulary	Series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip Control, program, system, input device, output device User, purpose, function, prototype, design criteria, innovative, appealing, design brief	Components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener Pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight User, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate	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

THE STOKE POGES SCHOOL

Design and Technology Long Term Plan

Year 5 Design and Technology Overview			
Term	**Autumn**	**Spring**	**Summer**
Unit	**Mechanical Systems - Cams**	**Food Technology – Baking**	**Textiles – Combing Different Fabric Shapes**
Final Product	**Moving weather system**	**Bread Making**	**Bags**
Building Cultural Capital	• Maggie Aderin-Pocock (Engineer)	• Paul Hollywood	• Vivian Westwood (Fashion Designer)
Technical Knowledge	• Understand that mechanical systems have an input, process and 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 unit	• Know about the benefits of whole grain flour to a plain flour and the reasons why some types of bread, such as wholemeal, are healthier than others and can be a source of carbohydrates in a healthy balanced diet • 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	• Know a 3D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics • Know fabrics can be strengthened, stiffened and reinforced where appropriate
Key Skills	**Evaluate existing products and designs over time** • Investigate famous manufacturing and engineering companies relevant to the unit **Design** • 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 **Make** • Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans that, 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 within the constraints of time, resources and cost • Measure, mark out, cut and shape accurately a range of materials	**Evaluate existing products and designs over time** • 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 • Understand how key chefs have influenced eating habits to promote varied and healthy diets **Design** • 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 ICT as appropriate to develop and communicate ideas **Make** • Write a step-by-step recipe, including list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients	**Evaluate existing products and designs over time** • Investigate and analyse textile products linked to their final product **Design** • 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, computer-aided design • Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification **Make** • Produce detailed lists of equipment and fabrics • 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 within the constraints of time, resources and cost

	• Join and combine materials and components accurately in temporary and permanent ways **Evaluate** • 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	• Make and present the bread appropriately for the intended user and purpose **Evaluate** • Evaluate the final product with reference back to the design brief and design specification, considering the views of others when identifying improvements	• Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of the fabric may require sharper scissors than would be used to cut paper) **Evaluate** • 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
Vocabulary	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 Annotated sketches, exploded diagrams Mechanical system, input movement, process, output movement Design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief	Ingredients, yeast, dough, bran, flour, wholemeal, unleavened, baking soda, spice, herbs Fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savour, source, seasonality Utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble Design specification, innovative, research, evaluate, design brief	Seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces Name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper Design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype

THE STOKE POGES SCHOOL

Design and Technology Long Term Plan

		Year 6 Design and Technology Overview	
Term	**Autumn**	**Spring**	**Summer**
Unit	**Structures** **Focus: Frame Structures**	**Mechanical Systems** **Focus: Pulley and Gears**	**Electrical Systems** **Focus: More Complex Switches and Circuits**
Final Product	**Anderson Shelters**	**Suspension Bridges**	**Toy linked to The Viewer**
Significant Designers	• Zaha Hadid (Architect) • Stephen Sauvestre	• Isambard Kingdom Brunel (Engineer) • Rosie the Riveter	• Thomas Edison (Engineer and Scientist) • Caroline Haslett (Electrical Engineer) • Andre Cassagnes (Electrical toy maker- Etch a sketch)
Technical Knowledge	• Understand how to strengthen, stiffen and reinforce 3D frameworks • Know and use technical vocabulary relevant to the unit	• Mechanical systems have an input, process and an output • Gears and pulleys can be used to speed up, slow down or change the direction of movement • Know technical vocabulary relevant to the unit	• Electrical systems have an input, process and an output • Understand how more complex electrical circuits and components can be used to create functional products • Apply their knowledge and understanding of computing to program, monitor and control their toy • Know technical vocabulary relevant to the unit
Key Skills	**Evaluate existing products and designs over time** • Investigate and evaluate a range of existing frame structures • Research designers and types of shelters **Design** • 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 **Make** • Formulate a clear plan, including step-by-step list of what needs to be done and lists of resources to be used	**Evaluate existing products and designs over time** • Investigate and analyse suspension bridge designs. Discuss why materials have been chosen. • analyse the methods of construction used and reasons for this **Design** • Use research to inform and develop detailed design criteria • Communicate their ideas through detailed labelled drawings • Plan the order of their work, choosing appropriate materials, tools and techniques • Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices • Identify the design features of their products that will appeal to the intended user **Make**	**Evaluate existing products and designs over time** • Investigate famous inventors who developed ground-breaking electrical systems and components **Design** • Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost • Generate and develop innovative ideas and share and clarify these through discussion • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams **Make** • 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

	• Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks • Use finishing and decorative techniques suitable for the project they are designing and making **Evaluate** • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests	• Measure, mark out, cut and shape accurately a range of materials, using appropriate tools, equipment and techniques • Assemble components to make working models • Use safely and increasingly effectively a wider range of tools, equipment and materials with increasing skill to make products that are fit for purpose • 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 the fabric may require sharper scissors than would be used to cut paper) **Evaluate** • Evaluate their ideas against their own design and consider the views of others to improve their work	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 **Evaluate** • 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
Vocabulary	Frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent Design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional	Pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor Circuit, switch, circuit diagram Annotated drawings, exploded diagrams Mechanical system, electrical system, input, process, output Design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief	Series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart Function, innovative, design specification, design brief, user, purpose