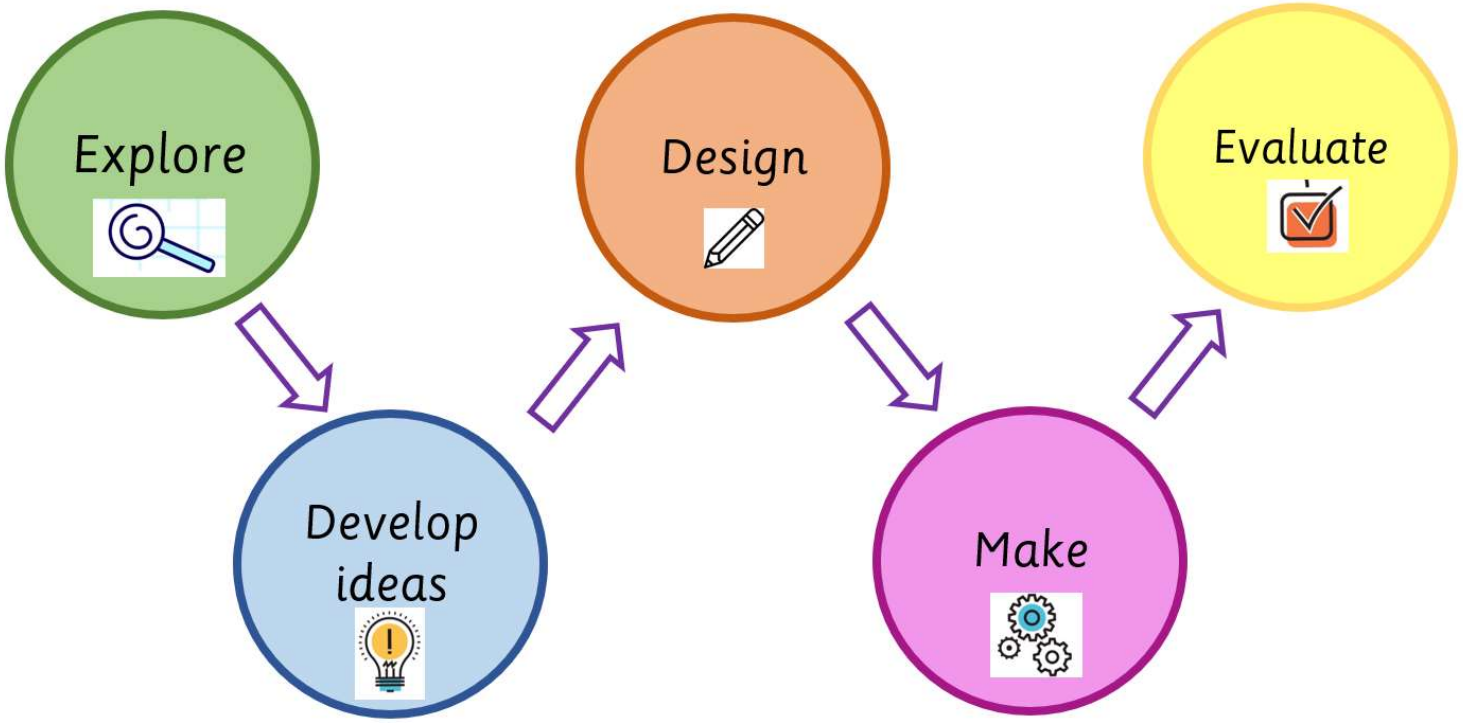
Design & Technology overview

Key concepts



Year 1	Autumn	Spring	Summer
Key skills & ideas (disciplinary knowledge)	Cut materials safely using tools provided. Measure and mark out to the nearest centimetre. Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling). Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen]	Create products using levers, sliders, wheels and axle mechanism	Cut, peel or grate ingredients safely and hygienically. Measure or weigh using measuring cups or electronic scales. Assemble or cook ingredients.
Key vocabulary	design, weave(ing), evaluate, woven, pattern, equipment, material, ideas, change, choose, select, mark out, join, decorate, finish	mechanism, link, linkage, pivot, ideas, design, practise, change, choose, select	peeling, chopping, slicing, fruit, ripe, diet, texture, flavour, ideas, design, practise, change, ingredients, resources, choose, select, healthy
Focus / Enquiry question	**Textiles** Weaving	**Mechanical Systems** Linkages	**Food Technology** Preparing Fruits and Vegetables
Learning objectives (substantive knowledge)	**Explore** • Vocab to introduce and use with the children: design, weave/weaving, evaluate. Children evaluate a range of woven products on the market that have been created using a largeweave. Discuss how they have been made – can the children see the 'over/under' pattern? **Develop ideas** • Introduce and practice the technique of 'over/under' weaving using a selection of materials, evaluating the effectiveness of each. **Design** • Children draw and colour their design for a placemat, labelling with their chosen material. **Make** • Make their woven placemat according to their design criteria, selecting appropriate tools, equipment and material. **Evaluate** Evaluate their finished product against their design (criteria and labelled drawing)	**Explore** • Vocab to introduce and use with the children: mechanism, link/linkage, pivot. Children investigate the effect of pushing and pulling a range of pre-made linkages and the related output/ movement, discussing ideas for images that could be put on the end (output) of the linkage. **Develop ideas** • Use strips of various materials and split pins to practise creating their own simple linkages that give a range of movement output, evaluating the effectiveness of each. **Design** • Children draw, colour and label their design for a greetings card that incorporates a linkage **Make** • Make their greetings card according to their design criteria. **Evaluate** Evaluate their greetings card against their design (criteria and labelled drawing)	**Health and Nutrition** • Vocab to introduce and use with the children: fruit, ripe, peel, slice, chop Introduce food groups/healthy and varied diet by zooming into fruits, including how and where they grow. **Develop ideas** • Explore a selection of fruits in terms of colour, shape, texture, flavour Practise peeling, slicing, chopping Design Create a list of chosen fruits for their fruit salad. Draw a labelled exploded diagram of their design **Make** • Make their fruit salad according to their chosen list of ingredients and following food hygiene procedures. **Evaluate** Evaluate their fruit salad against their design in terms of presentation and taste. With support, suggest adaptations or improvements.
Resources	Books and other products with weaving examples. Card/card board, weaving template and patterns Masking tape, tape, stick glue Long fabric strips, wool, different materials Left/right-handed scissors, cutting mats, finishing media and materials	Books and other products with lever and linkage mechanisms Lever and linkage teaching aids card strips, card rectangles, paper, masking tape, paper fasteners, paper binders, stick glue Left/right-handed scissors, cutting mats, card drill, finishing media and materials	Range of fresh fruit and vegetables Chopping boards, knives, peelers, graters, skewers, juicers, spoons, jugs, plates, bowls, aprons, plastic table covers, hand washing and washing-up facilities Yogurt making machine or blender, if appropriate
National curriculum	Explore and evaluate a range of existing products 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 Select from and use a range of tools and equipment to perform practical tasks. Select from and use a wide range of materials and components according to their characteristics. Evaluate their ideas and products against design criteria.	Explore and evaluate a range of existing products 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 Select from and use a range of tools and equipment to perform practical tasks Select from and use a wide range of materials and components according to their characteristics. Evaluate their ideas and products against design criteria Technical knowledge: explore and use mechanisms in their product.	Use the basic principles of a healthy and varied diet to prepare dishes Understand where food comes from. Design appealing food products for themselves and other users based on design criteria Generate, develop, model and communicate their ideas through talking and drawing Select from and use a range of tools and equipment to perform practical tasks Select from and use a range of ingredients according to their characteristics Evaluate their ideas and products against design criteria * peeling * chopping * slicing

Year 2	Autumn	Spring	Summer
Key skills & ideas (disciplinary knowledge)	Practise drilling, screwing, gluing and nailing materials to make and strengthen products	Create products using levers, sliders, wheels and axle mechanism	Cut, peel or grate ingredients safely and hygienically. Measure or weigh using measuring cups or electronic scales. Assemble or cook ingredients.
Key vocabulary	structure, chute, stable, stability, design criteria, materials, cut, fold, join, fix, metal, wood, plastic	mechanism, axle, chassis, vehicle, design criteria, equipment, assembling, cutting, joining, shaping, finishing, fixed, free	vegetable, crudites, dip, recipe, measure, stir, ingredients
Focus / Enquiry question	**Structures** Marble Run	**Mechanical Systems** Wheels and Axles	**Food Technology** Dips and crudites
Learning objectives (substantive knowledge)	**Explore** • Vocab to introduce and use with the children: structure, chute, stable/stability, prototype Evaluate a marble run in terms of purpose, materials, construction etc. **Develop ideas** • Explore a range of materials, including cutting and joining techniques, to create prototypes of one section of a marble run, evaluating pros and cons of each **Design** • Use their observations and comments about the original marble run, as well as their work with prototypes, to establish a design criteria that will allow a marble to roll along its length. Draw, colour and label their design for a section of marble run. **Make** • Make their section of marble run according to their design criteria, selecting appropriate tools, equipment and materials. **Evaluate** • Test and evaluate their section of marble run against their design criteria, suggesting improvements and adaptations with support. Consider joining multiple sections together to create a whole-class marble run. How long can they keep the marble rolling?	**Explore** • Vocab to introduce and use with the children: mechanism, axle, chassis Explore a range of toy cars and vehicles, identifying features and how they move, naming key parts (wheel, axle, chassis). **Develop ideas** • Children learn how to measure, mark and cut dowel, and attach wheels using washers if necessary. **Design** • In groups, children establish their design criteria and use this to design a moving vehicle. Draw, colour and label their design. **Make** • In groups, make their chosen vehicle, using appropriate materials, joining techniques and decorative features (using computing skills as appropriate). **Evaluate** • Evaluate their vehicle against their design (criteria and labelled drawing)	**Health and Nutrition** • Vocab to introduce and use with the children: vegetable, crudites, dip, recipe, measure, stir • Revise food groups/healthy and varied diet by zooming into vegetables, including how and where they grow. Introduce the idea of dips and crudites: taste test a selection of dips and evaluate. **Develop ideas** • Explore a selection of vegetables in terms of colour, shape, texture for crudites. Practise good food hygiene to peel, slice, chop and stir ingredients. **Design** • Children vote as a class to decide on the preferred dip that will be made; write a list of ingredients and draw a labelled exploded diagram of their dip with accompanying crudites. **Make** • Follow a simple recipe to make their class dip, and prepare their crudites by peeling and slicing their chosen vegetable(s). **Evaluate** • Evaluate their dip and crudites against their design, suggesting adaptations with support.
Resources	Photographs and books containing various structures and mainly examples of marble runs Construction kits that can be used to construct freestanding structures e.g. marble runs. Paper, card, plastic sheet, paper and plastic straws, pipe cleaners reclaimed materials including small containers, card boxes. Cotton reels, string, masking tape pva glue, plasticine, left/right handed scissors, hole punch, stapler finishing media and materials	Selection of toy vehicles with differently fixed axles Card boxes, card, cotton reels, plastic tubing, dowel, clothes pegs, paper sticks/dowel, paper/plastic straws, card discs, mdf wheels, wooden wheels Single hole punch, card drill, cutting mat, masking tape, pva glue, paint, thin/thick paint brushes, felt tip pens, decorative paper, double sided sticky fixers, junior hacksaw, vice, left/right handed scissors	Vegetables, chickpeas, olive oil, lemon juice, yoghurt. Chopping boards, knives, peelers, graters, juicers, spoons, jugs, mixing spoons, mashers, plates, bowls, aprons, plastic table covers, hand washing and washing-up facilities. Blender/food processor
National curriculum	Explore and evaluate a range of existing products 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 Select from and use a range of tools and equipment to perform practical tasks Select from and use a wide range of materials and components according to their characteristics Evaluate their ideas and products against design criteria Technical knowledge: build structures, exploring how they can be made stronger, stiffer and more stable	Explore and evaluate a range of existing products 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 Select from and use a range of tools and equipment to perform practical tasks Select from and use a wide range of materials and components according to their characteristics Evaluate their ideas and products against design criteria Technical knowledge: explore and use mechanisms in their product	Use the basic principles of a healthy and varied diet to prepare dishes Understand where food comes from. Design appealing food products for themselves and other users based on design criteria Generate, develop, model and communicate their ideas through talking and drawing Select from and use a range of tools and equipment to perform practical tasks Select from and use a range of ingredients according to their characteristics Evaluate their ideas and products against design criteria * peeling * chopping * slicing * Stirring

Year 3	Autumn	Spring	Summer
Key skills & ideas (disciplinary knowledge)	Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest millimetre. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques.	Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as linked levers or pneumatics).	Prepare ingredients hygienically using appropriate utensils. Measure ingredients to the nearest gram accurately. Follow a recipe. Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking)
Key vocabulary	textiles, thread, aesthetics, decoration, product, materials, prototypes	mechanism, base, lever, fulcrum, annotate, catapult, research	seasonal, savoury, recipe, measure, heat source, suggest, healthy, varied diet
Focus / Enquiry question	**Textiles** 2D Shape in to a 3D product: Christmas Tree Decoration	**Mechanical Systems** Catapults	**Food Technology** vegetable soup
Learning objectives (substantive knowledge)	**Explore** • Vocab to introduce and use with the children: textiles, thread, aesthetics Children evaluate a range of Christmas textile tree decorations on the market, discussing how they have been made. **Develop ideas** • Sewing – threading needles, tying knots, running stitch using Binca; Apply to swatches of different fabrics, evaluating pros and cons. **Design** • Children establish design criteria for a textile Christmas tree decoration Design their Christmas tree decoration by creating a labelled exploded diagram. **Make** • Make their Christmas decoration, guided by their design criteria. **Evaluate** • Evaluate their finished product against their design (criteria and exploded diagram)	**Explore** • Vocab to introduce and use with the children: mechanism, base, lever, fulcrum Children explore everyday levers, including their arm when throwing a ball, to establish that a lever is a mechanism that has a balance point – when a force is applied at one end, it causes the load at the other end to move. Identify and label components: lever, fulcrum, load, effort/force **Develop ideas** • Explore and investigate a range of ways to join materials to create a stable base and a lever with a fulcrum, as well as elastic bands as potential energy. **Design** • Establish a design criterion for an effective catapult. In groups design a catapult, labelling the key components of their mechanism – base, fulcrum, lever, load **Make** • In groups, make their catapult according to their design criteria. **Evaluate** • Test and evaluate their catapult against others in the class and against their original design, measuring distance of propulsion accurately. Suggest improvements with support.	**Health and Nutrition** • Vocab to introduce and use with the children: seasonal, savoury, recipe, measure, heat source - Using a selection of vegetable soups already on the market, evaluate ingredients in terms of health and nutrition, as well as where/how they are grown. - introduce the terms 'savoury' and 'seasonal' **Develop ideas** • Taste test a range of vegetable soups. Create a survey based on what they find out as a basis for market research for their own recipe. • Complete further research into which vegetables are seasonal at this time of year. **Design** • Write a list of 'non-negotiable' ingredients for their vegetable soup based on their market research and on their knowledge of seasonal vegetables. • Research a recipe that meets most/all these criteria. **Make** • Follow food hygiene procedures and their vegetable soup recipe to prepare their ingredients. Under adult supervision, use a heat source to cook their soup. **Evaluate** • Taste-test their soup; create an evaluation sheet that will allow some of those who completed the survey to also give feedback. with support, suggest adaptations to improve taste or presentation.
Resources	Collection of textile products linked to the chosen product to be made. Selection of fabrics and fastenings Left/right handed scissors, needles, thread, tape, fabric glue, pins, measuring tape. Items to use for finishing e.g. Fabric paints, threads, appliqué pieces, paints for printing, thin paint brushes	Photographs and books containing various catapult structures. Rubber bands, plastic bottle caps, straws, card, kitchen towel or craft foam, flat headed thumb tacks, double sided sticky fixers, hot glue gun, ruler, pencil. 1cm square dowel, 5mm rounded dowel, Junior hacksaw, vice, glass paper, g-clamps, bench hooks, cutting mats, left/right-handed scissors	Vegetables, cream, Chopping boards, knives, peelers, graters, juicers, spoons, jugs, mixing spoons, mashers, plates, bowls, aprons, plastic table covers, hand washing and washing-up facilities. Pots, pans, cooker. Blender/food processor
National curriculum	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 accurately Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities 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	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 accurately Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities 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 Technical knowledge: understand and use mechanical systems in their products - levers	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. Generate, develop, model and communicate their ideas through discussion, annotated sketches and cross-sectional and exploded diagrams Select from and use a wider range of tools and equipment to perform practical tasks accurately Select from and use a wider range ingredients according to their characteristics and aesthetic qualities Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work * peeling * chopping * slicing * heat source

Year 4	Autumn	Spring	Summer
Key skills & ideas (disciplinary knowledge)	Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques.	Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as linked levers or pneumatics).	Prepare ingredients hygienically using appropriate utensils. Measure ingredients to the nearest gram accurately. Follow a recipe. Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking)
Key vocabulary	packaging, net, tab, reinforce, environment, improvements,	mechanism, electrical system, circuit, motor, improvements	mix, sweet treat, heat source, nutrition,mprovements, presentation
Focus / Enquiry question	**Structures** Shell Structures: Packaging	**Electrical Systems** Simple Circuits and Switches	**Food Technology** Cupcakes
Learning objectives (substantive knowledge)	**Explore** • Vocab to introduce and use with the children: packaging, net, tab, reinforce Evaluate packaging already on the market and the features of each. Use egg boxes to focus the children in on packaging to protect the product. Discuss materials (purpose and environmental impact) **Develop ideas** • Deconstruct packaging and introduce the term 'net', identifying the tabs and what these are for, as well as joining techniques and where the packaging may have been reinforced. - explore nets, both with and without tabs, building prototypes and discussing effectiveness of design and joining techniques **Design** • Use their observations and comments about the original packaging, as well as their work with prototypes, to establish a design criteria for packaging for sweets. Children draw and label their packaging, including design features. **Make** • Make their sweet packaging according to their design criteria, selecting appropriate tools, equipment and materials (eg choosing to hand draw their graphic designs or use a computer program to create lettering/clip art pics) **Evaluate** • Evaluate their finished product against their design (criteria and labelled diagram), suggesting improvements and adaptations.	**Explore** • Vocab to introduce and use with the children: mechanism, electrical system, circuit, motor Children explore and label images of a range of fairground rides in terms of movement and construction. **Develop ideas** • Build simple circuits that incorporate a motor and attach items to the motor to see movement - create prototypes of fairground rides, using various materials, considering how parts will be connected and where passengers will sit. **Design** • In groups, establish design criteria for a fairground ride. • Create an exploded diagram of their design, including a circuit diagram of their electrical system, as well as labelling materials and movement. **Make** • In groups, make their fairground ride according to their design criteria. **Evaluate** • Test and evaluate their finished product against their design (criteria and exploded diagram), suggesting improvements and adaptations.	**Health and Nutrition** • Vocab to introduce and use with the children: weigh, mix, sweet treat, heat source - Using a selection of cupcakes already on the market, evaluate ingredients in terms of health and nutrition, and establish they are 'sweet treats' rather than food to be eaten every day. **Develop ideas** • Taste test a range of cupcakes that are already on the market. Evaluate in terms of presentation and taste. Create a survey based on what they find out as a basis for market research for their own recipe. Make sure to include questions about the decoration as well as the cake itself. **Design** • Research a recipe for simple cupcakes that meet most/all the criteria established by the market research. Write a list of ingredients. Draw a labelled exploded diagram of their cupcake plus decorations. **Make** • Follow food hygiene procedures and follow their chosen recipe. Under adult supervision, bake the cupcakes in the school oven. Once cool, decorate according to their design criteria. **Evaluate** • Taste-test their cupcakes, considering presentation and taste. Create an evaluation sheet that will allow some of those who completed the survey to also give feedback. Suggest adaptations to improve taste or presentation.
Resources	Collection of shell structures for different purposes and users. Card, squared paper, coloured paper, adhesive tape, masking tape, pva glue, glue spreaders, acetate sheet, pencils, felt-tip pens, rulers, right/left handed scissors Computer with computer-aided design (cad) software, printer	Handling collection of battery-powered electrical products Switches including toggle, push-to-make and push to-break Aluminium foil, paper fasteners, paper clips, card, corrugated plastic, reclaimed materials, finishing materials and media Buzzers, bulbs, bulb holders, zinc carbon or zinc chloride batteries batteries, battery holders, wire, automatic wire strippers Suitable control program with interface box or standalone control box Right/left-handed scissors, pva glue, cutting mats.	Flour, butter, sugar, eggs, vanilla essence, icing sugar. *optional: chocolate drops, blueberries, glacier cherries Chopping boards, spoons, jugs, bun cases, mixing spoons, plates, bowls, aprons, plastic table covers, hand washing and washing-up facilities. Weighing scales Bun trays, oven, oven gloves
National curriculum	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 accurately Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities 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 Technical knowledge: apply their understanding of how to strengthen, stiffen and reinforce more complex structures	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, crosssectional 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 accurately Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities 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 Technical knowledge: understand and use electrical systems in their products	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. Generate, develop, model and communicate their ideas through discussion, annotated sketches and cross-sectional and exploded diagrams Select from and use a wider range of tools and equipment to perform practical tasks accurately Select from and use a wider range ingredients according to their characteristics and aesthetic qualities Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work * weighing * mixing * heat source

Year 5	Autumn	Spring	Summer
Key skills & ideas (disciplinary knowledge)	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).	Convert rotary motion to linear using cams. Use innovative combinations of electronics (or computing) and mechanics in product designs.	Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Demonstrate a range of baking and cooking techniques. Create and refine recipes, including ingredients, methods, cooking times and temperatures
Key vocabulary	seam, backstitch, fastening, embellish(ment), hems, fastening, threading, swatches, accurate, evaluate	mechanism/mechanical system, cam, rotary, linear, evaluate, automata, inspiration	savoury, dough, knead, roll, yeast, evaluate, seasonality, reared, processed, sources, variation
Enquiry question	**Textiles** Combining Different Fabric Shapes: Money Container	**Mechanical Systems** Cams	**Food Technology** Celebrating Culture and Seasonality: Pizzas
Learning objectives (substantive knowledge)	**Explore** • Vocab to introduce and use with the children: seam, backstitch, fastening, embellish(ment) Children evaluate a range of fabric money containers on the market, identifying hems, fastenings and embellishments and why these are necessary. **Develop ideas** • sewing Threading needle, tying knot, backstitch, joining to fabric swatches to create a seam, adding a button and loop **Design** • Establish design criteria for their money container. Design their money container by creating a labelled exploded diagram. **Make** • Make their money container, guided by their design criteria **Evaluate** • Test their finished product by placing coins in their money container. • Evaluate against their design (criteria and exploded diagram)	**Explore** • Vocab to introduce and use with the children: mechanism/mechanical system, cam, rotary, linear Explain that a cam is a device in a mechanism that turns rotary motion into linear motion. • Explore examples of everyday cams and share examples of pre-built cams, giving children the opportunity to use and test them. Show some of Peter Markey's automata as inspiration for their own designs. **Develop ideas** • Measure, mark and cut dowel, frame, use appropriate joining techniques. **Design** • In groups, children design a cam automata - Establish a design criteria and in groups, design a cam automata by creating a cross-section diagram of their design, labelling materials and movement. **Make** • In groups, make their cam automata according to their design criteria. **Evaluate** • Test and evaluate their cam automata against their design (criteria and cross-section diagram), suggesting improvements and adaptations.	**Health and Nutrition** • Vocab to introduce and use with the children: savoury, dough, knead, roll, yeast - Using children's background knowledge of pizza, evaluate the health and nutrition offered by key ingredients. - Also research where and how some key ingredients are grown, reared, caught and processed, sorting some into British ingredients and those sourced abroad. **Develop ideas** • Discuss variations of pizza base and toppings. Research pizza dough – what it is, how it is made, why it needs yeast, why is has to be kneaded and left to rise etc. **Design** • Draw and label an exploded diagram of their pizza design. Research a recipe and write a list of ingredients for their pizza. **Make** • In pairs/groups, follow food hygiene procedures and an appropriate pizza recipe – under adult supervision, cook in school oven (**CAUTION** oven must be VERY HOT**) **Evaluate** • Taste-test their pizza, considering presentation as well as taste. Suggest adaptations to improve taste/presentation.
Resources	Existing textile products for investigation and deconstruction linked to their product. Wide selection of textiles including reclaimed and reusable fabrics, dipryl, Pins, needles, thread, measuring tape, left/right handed fabric scissors, pinking shears iron, iron transfer paper, sewing machine Range of fastenings, materials for insulating or strengthening e.g. Bubble wrap, wadding, interfacing. Finishing materials e.g. Sequins, buttons, fabric paints	Videos and photographs of cams, models or toys with different cam mechanisms Mdf, card or wooden wheels, plastic or wooden cams, dowel, card boxes, pva glue, masking tape, double-sided tape, square section wood, card, corrugated plastic, finishing media Junior hacksaws, glass paper, g-clamps, bench hooks, hand drill	Information about food from around the world Video clips of foods in the context of where they come from, used and eaten. Range of relevant examples of foods to taste and evaluate Basic recipes. Suitable equipment and utensils to make and cook recipes such as: weighing scales, measuring jugs, bowls, spoons – various sizes, baking trays, parchment paper, plastic film ****Trip to Pizza Express**
National curriculum	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 accurately Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities 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	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 accurately. Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities. 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.Technical knowledge: understand and use mechanical systems in their products – cams	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. Generate, develop, model and communicate their ideas through discussion, annotated sketches and cross-sectional and exploded diagrams Select from and use a wider range of tools and equipment to perform practical tasks accurately Select from and use a wider range ingredients according to their characteristics and aesthetic qualities Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work * weigh * mix * knead * roll

vfdfYear 6	Autumn	Spring	Summer
Key skills & ideas (disciplinary knowledge)	Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).	Coverage: Create products using electronics kits that employ a number of components (such as LEDs and resistors). Write code to control and monitor models or products	Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Demonstrate a range of baking and cooking techniques. Create and refine recipes, including ingredients, methods, cooking times and temperatures
Key vocabulary	engineer, strut, load, symmetry, accuracy, aesthetic, functional, techniques, reinforce, frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent	control, program, system, process, input device, output device, microcontroller, LED, functional, practical, innovative, evaluate, specification, microswitches, modify	savoury, pastry, sift, rub, accuracy, evaluate, adaptation
Enquiry question	**Structures** Bridge Bonanza	**Electrical systems** Monitoring and Control: An electronic moneybox	- **Food Technology** - Short crust pastry (savoury tarts)
Learning objectives (substantive knowledge)	**Explore** • Vocab to introduce and use with the children: engineer, strut, load, symmetry • Explore images of a range of bridges from around the world, discussing in terms of purpose and design. Introduce important civil engineers through history, including Isambard Kingdom Brunel, Thomas Telford, Gustave Eiffel, Joseph Strauss **Develop ideas** • Use lolly sticks and a range of joining techniques to practise making straight joints, angled joints and trusses. Make a beam, extending the length, strengthening and reinforcing with struts and trusses. **Design** • Establish a design criteria. In groups, children draw and label their bridge design. **Make** • In groups, build their bridge according to their design criteria, selecting appropriate tools, equipment and materials. **Evaluate** • Test their bridge against their design criteria, including adding weights (the load) on their bridge. Evaluate their bridge against their design (criteria and labelled drawing), suggesting improvements and adaptations based on evident weaknesses in their structures.	**Explore and Develop Ideas** • Vocab to introduce and use with the children: Control, program, system, process, input device, output device, microcontroller, LED. Expose children to a range of products that use computing to program, monitor and control them. For example, nightlights, garden lights, alarm systems, security lighting. These all respond to changes in the environment using a computer control program. **Ask key question:** • Why is a computer control program used to operate these products? What is the advantage? Discuss input devices e.g. switches and output devices e.g. bulbs and buzzers. Children to document their ideas. Zoom in on light dependent resistors (LDRs) and a range of switches such as push to make, push to break, toggle, micro and reed switches. -Children gain an understanding of how they operate and use each component to control a lightbulb in a simple circuit. Children could research a famous inventor related to this project e.g. Thomas Eddison – light bulb. **Design** • Establish design criteria for an electronic moneybox by considering these key questions: Who will my moneybox be for? How will it motivate the user to save money? How might it be programmed? What components will it need? Children annotate sketches and generate a design specification. Children should indicate the location of electrical components and how they work as a system including input, process and output. Reference to be made to the control program (Crumble) used and how it will operate the inputs (Micro input) and outputs (sparkle LED). Children produce a step-by-step plan including all tools needed. **Make** • Children make the electronic moneybox applying the knowledge and understanding of the process. Children create and modify a computer control program to enable the product to work automatically in response to changes in the environment.	**Health and Nutrition** • Vocab to introduce and use with the children: savoury, pastry, sift, rub - Using a selection of savoury tarts already on the market, evaluate ingredients in terms of health and nutrition • Research where and how some key ingredients are grown, reared, caught and processed, and evaluate the pros and cons of shop-bought and home-made produce. **Develop ideas** • Taste test a range of savoury tarts that are already on the market. Evaluate in terms of presentation and taste. • Research short crust pastry – what it is, how it is made, what it means to rub and sift, and why itis important to not over-work the dough. **Design** • Research a recipe for their preferred tart that meet most/all the criteria established by their discussion/preferences for fillings. • Write a list of ingredients and draw a labelled cross-section diagram. **Make** • In pairs/groups, follow food hygiene procedures and their savoury tart recipe to make their tart. Under adult supervision, cook in school oven. **Evaluate** • Taste-test their savoury tart, considering presentation as well as taste. Suggest adaptations to improve taste or presentation.

		Evaluate • Test and evaluate their electronic moneybox and critically evaluate comparing it to the original design specification. Test the system to demonstrate its effectiveness for the intended user and purpose. Further questions for extended evaluation could include: How could children adapt the program so that it would detect a burglar stealing the moneybox? What type of output device could they use?	
Resources	Products, photographs, web-based resources of existing bridge frame structures. Card, paper straws, newspaper, square sectioned wood, dowel, Paper, card, cardboard. Masking tape, PVA glue, hot glue. Pencils, rulers, right/left-handed scissors. Bench hooks, G-clamp, junior hacksaws, glass paper (sand paper), finishing media and materials	Microcontroller or standalone control box or interface box. Collection of battery-powered, manually controlled and programmable products Batteries, battery holders, crocodile leads. Different output devices including bulbs with bulb holders, buzzers, light emitting diodes (leds), motors. Different input devices including micro switches, reed switches and magnets, light dependent resistors (ldrs). Wire, automatic wire strippers, masking tape, construction materials and tools as required	Various savoury tarts and quiches. Flour, butter, egg, milk, grated cheese. *optional: bacon pieces, tomatoes, onions. Chopping boards, knives, peelers, graters, juicers, spoons, jugs, mixing spoons, mashers, plates, bowls, aprons, plastic table covers, hand washing and washing-up facilities. Oven, oven gloves, baking tray, bun tray
National curriculum	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 accurately Select from and use a wider range of materials and components according to their functional properties and aesthetic qualities 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 Technical knowledge: apply their understanding of how to strengthen, stiffen and reinforce more complex structures	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 accurately 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 Technical knowledge: apply their understanding of computing to program, monitor and control their products	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. Generate, develop, model and communicate their ideas through discussion, annotated sketches and cross-sectional and exploded diagrams Select from and use a wider range of tools and equipment to perform practical tasks accurately Select from and use a wider range ingredients according to their characteristics and aesthetic qualities Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work * weigh * sift * rub * Roll