KS2 Design Technology Curriculum Overview

Year 3,4,5,6			(8/12 hrs per project - 1 project per term).
Pupils should develop knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts (for example, the home and school, gardens and playground the local community, industry and the wider environment). **Cooking and Nutrition –** Pupils should prepare and cook a variety of predominantly savoury dishes using an range of cooking techniques. They should develop their knowledge of where food comes from ensuring they understand seasonality and that ingredients are grown, reared, caught and processed. Children should be able to understand and apply the principles of a healthy and varied diet.			
	Autumn	**Spring**	**Summer**
Year 3	**Food – A Healthy and Varied Diet**	**Structures – Shell structures including CAD**	**Textiles – 2D shape to 3D product**
	Designing • Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. • Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas. **Making** • Plan the main stages of a recipe, listing ingredients, utensils and equipment.	**Designing** • Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. • Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas. **Making** • Plan the order of the main stages of making. • Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy.	**Designing** • Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Produce annotated sketches, prototypes, final product sketches and pattern pieces. **Making** • Plan the main stages of making. • Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing. • Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.

	• 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. **Evaluating** • 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. **Technical Knowledge** • 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.	• Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating. **Evaluating** • Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose. Technical Knowledge • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Develop and use knowledge of how to construct strong, stiff shell structures. • Know and use technical vocabulary relevant to the project.	**Evaluating** • Investigate a range of 3-D textile products relevant to the project. • Test their product against the original design criteria and with the intended user. • Take into account others' views. • Understand how a key event/individual has influenced the development of the chosen product and/or fabric. Technical Knowledge • Know how to strengthen, stiffen and reinforce existing fabrics. • Understand how to securely join two pieces of fabric together. • Understand the need for patterns and seam allowances. • Know and use technical vocabulary relevant to the project.
Suggested Vocabulary	• name of products • names of equipment • utensils • techniques and ingredients • Texture • Taste • Sweet	• shell structure • three-dimensional (3-D) shape • net • cube • cuboid • prism • vertex • edge	• Fabric • names of fabrics • fastening • Compartment • Button • Structure

	• 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	• 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	• 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

Year 4	Electrical Systems – Simple circuits and switches	Mechanical Systems – Levers and Linkages	Cooking and Nutrition – Preparing fruit and vegetables
	Designing • Gather information about users' needs and wants, and develop design criteria to inform the design of products that are fit for purpose. • Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. **Making** • Order the main stages of making. • Select from and use tools and equipment to cut, shape, join and finish with some accuracy. • Connect simple electrical components and a battery in a series circuit to achieve a functional outcome. • Program a standalone control box, microcontroller or interface box to enhance the way the product works. **Evaluating** • Investigate and analyse a range of existing battery-powered products, including pre-programmed and programmable products.	**Designing** • 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. **Making** • Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. • Select from and use finishing techniques suitable for the product they are creating. **Evaluating** • Investigate and analyse books and, where available, other products with lever and linkage mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make. **Technical Knowledge and Understanding** • Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots.	**Designing** • Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose. • Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas. **Making** • 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. **Evaluating** • 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. **Technical Knowledge**

	• Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work. **Technical Knowledge and Understanding** • Understand and use computing to program and control products containing electrical systems, such as series circuits incorporating switches, bulbs and buzzers. • Know and use technical vocabulary relevant to the project.	• Know and use technical vocabulary relevant to the project.	• 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.
Suggested Vocabulary	• series • circuit • fault • connection, • toggle switch • push-to-make switch • push-to-break switch • battery • battery holder • light emitting diode (LED) • bulb • bulb holder • USB cable • Wire • insulator, • conductor • crocodile clip • Control • Program • System	• mechanism • lever • linkage • pivot • slot • bridge • guide • system • input • process • output • linear • rotary • oscillating • reciprocating • user • purpose	• 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,

	• input device • output device • process • User • Purpose • Function • Prototype • design criteria • innovative • Appealing • design brief	• function • prototype • design criteria • innovative • appealing • design brief	• edible, • grown, • reared, • caught, • frozen, • tinned • processed • seasonal, • harvested • healthy/varied diet • planning • design criteria, • purpose • user • annotated sketch • sensory evaluations
Year 5	**Structures – Frame Structures**	**Electrical Systems – More Complex Circuits and Switches**	**Food – Celebrating Culture and Seasonality**
	Designing • Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.	**Designing** • 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. **Making**	**Designing** • Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.

	Making • Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making. **Evaluating** • Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures. **Technical Knowledge and Understanding** • Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.	• Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. **Evaluating** • 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. **Technical Knowledge and Understanding** • Understand and use electrical systems in their products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.	**Making** • Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose. **Evaluating** • Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets. **Technical Knowledge and Understanding** • Know how to use utensils and equipment including heat sources to prepare and cook food. • Understand about seasonality in relation to food products and the source of different food products.

			• Know and use relevant technical and sensory vocabulary.
Suggested Vocabulary	• frame structure • stiffen • strengthen • reinforce • triangulation • stability • shape • join • temporary • permanent • design brief • design specification • prototype • annotated sketch • Purpose • User • Innovation • Research • functional	• 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	• ingredients • yeast • dough • bran • Flour • Wholemeal • Unleavened • baking soda • Spice • Herbs • Fat • Sugar • Carbohydrate • Protein • Vitamins • Nutrients • Nutrition • Healthy • Varied • Gluten • Dairy • Allergy • Intolerance • Savoury • 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
Year 6	**Textiles – Combining Different Fabric Shapes**	**Food Celebrating Culture and Seasonality**	**Mechanical Systems – Pulleys or Gears**
	Designing • Generate innovative ideas by carrying out research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computer-aided design. • Design purposeful, functional, appealing products for the intended	**Designing** • Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. • Explore a range of initial ideas, and make design decisions to develop a final product linked to user and purpose. • Use words, annotated sketches and information and communication technology	Designing • 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. **Making**

	user that are fit for purpose based on a simple design specification. **Making** • Produce detailed lists of equipment and fabrics relevant to their tasks. • Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. **Evaluating** • Investigate and analyse textile products linked to their final product. • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. **Technical Knowledge and Understanding** • A 3-D textile product can be made from a combination of accurately made	as appropriate to develop and communicate ideas. **Making** • Write a step-by-step recipe, including a list of ingredients, equipment and utensils • Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients. • Make, decorate and present the food product appropriately for the intended user and purpose. **Evaluating** • Carry out sensory evaluations of a range of relevant products and ingredients. Record the evaluations using e.g. tables/graphs/charts such as star diagrams. • Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. • Understand how key chefs have influenced eating habits to promote varied and healthy diets. **Technical Knowledge and Understanding** • Know how to use utensils and equipment including heat sources to prepare and cook food.	• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost. **Evaluating** • Compare the final product to the original design specification. • Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project. **Technical Knowledge and Understanding** • Understand that mechanical and electrical systems have an input, process and an output. • Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement. • Know and use technical vocabulary relevant to the project.

	pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate.	• Understand about seasonality in relation to food products and the source of different food products. • Know and use relevant technical and sensory vocabulary.	
Suggested Vocabulary	• 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	• ingredients • yeast • dough • bran • Flour • Wholemeal • Unleavened • baking soda • Spice • Herbs • Fat • Sugar • Carbohydrate • Protein • Vitamins • Nutrients • Nutrition • Healthy • Varied • Gluten • Dairy • Allergy • Intolerance • Savoury • Source • Seasonality • Utensils	• 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

		• Combine • Fold • Knead • Stir • Pour • Mix • Rubbing in • Whisk • Beat • Roll out • Shape • Sprinkle • Crumble • design specification • innovative • research • evaluate design brief	• design specification • design brief