Curriculum aims

Our curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

By the end of EYFS, children at Fairfield Road will be able:

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function
- Share their creations, explaining the process they have used
- Make use of props and materials when role playing characters in narratives and stories

By the end of KS1, children at Fairfield Road will be able to:

Design

- 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

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

- explore and evaluate a range of existing products
- 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 use mechanisms [for example, levers, sliders, wheels and axles], in their products.

By the end of KS2, children at Fairfield Road will be able to:

Design

- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

- investigate and analyse a range of existing products
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products.

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

Key stage 1

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

Key stage 2

- 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.

	EYFS	KS1	LKS2	UKS2
Design	**Food** – name, prepare, taste **Designing** • Design appealing products for a particular use – Birthday cake (N) • Generate initial ideas and vocabulary through investigating a variety of fruit and vegetables. (R) • Communicate these ideas through talk, story and drawings. **Mechanisms** – flap books **Designing (R)** • Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas with card and paper. Discussion to communicate ideas **Mechanisms** – wheels /emergency vehicles **Designing (N)** • Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and use of toys **Structures** – 2D and 3D representations **Designing (R)**	**Food** – preparing fruit and veg **Designing** • Design appealing products for a particular user based on simple design criteria. • Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. • Communicate these ideas through talk and drawings. **Mechanisms** – sliders and levers **Designing** • Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper. **Mechanisms** – wheels and axels **Designing** • Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups. **Structures** – free standing structures **Designing** • Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings.	**Food** – healthy and varied diet **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. **Mechanisms** – levers and linkages **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. **Mechanisms** – Pneumatics **Designing** • 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. **Structures** – shell structures	**Food** – celebrating culture and seasonality **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. **Mechanisms** – pulleys or gears **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. **Mechanisms** – cams **Designing** • Generate innovative ideas by carrying out research using surveys, interviews,

	• Generate ideas based on simple design criteria (design sheets) and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking play with toys. **Textiles** – characteristics, cutting and sticking **Designing (N)** • Design a textured and appealing collage based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking	**Textiles** – Templates and joining **Designing** • Design a functional and appealing product for a chosen user and purpose based on simple design criteria. • Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.	**Designing** • Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product. • Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas. **Structures** – shell structures using CAD **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. **Textiles** – 2D shape to 3D shape **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. **Electrical systems** – simple circuits and switches **Designing**	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. **Textiles** – combining different fabric shapes **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 user that are fit for purpose based on a simple design specification. **Textiles** – using CAD in textiles **Designing** • Generate innovative ideas through research including surveys, interviews and questionnaires. • Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes including using computer-aided 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. **Electrical systems** – simple programming and control **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.	• Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification. **Structures** – frame structures **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. **Structures** – Frame structures using CAD **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 frame structures and use computer-aided design to model and communicate ideas. **Electrical** systems – more complex switches and circuits **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. **Electrical** systems – monitoring and control **Designing** • Develop a design specification for a functional product that responds automatically to changes in the environment. • Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.
Making	**Food** – name, prepare, taste **Making (N,R)** • Use simple utensils and equipment to e.g. peel, cut, slice, mix safely. • Discuss a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. **Mechanisms** – flap books	**Food** – preparing fruit and veg **Making** • Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. • Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product. **Mechanisms** – sliders and levers	**Food** – healthy and varied diet **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	**Food** – celebrating culture and seasonality **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.

	Making (R) • Discuss what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. **Mechanisms** – wheels /emergency vehicles **Making (N)** • 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 and card according to their characteristics. **Structures** – 2D and 3D representations **Making (R)** • Plan by suggesting what to do next. • Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits (KNEX, MOBILO) to build their structures. **Textiles** – characteristics, cutting and sticking **Making(N)** • Select from and use a range of tools and equipment to perform practical tasks such as cutting and sticking	**Making** • Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating. **Mechanisms** – wheels and axels **Making** • 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. **Structures** – free standing structures **Making** • Plan by suggesting what to do next. • Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating. **Textiles** – Templates and joining **Making** • Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing.	products, thinking about sensory characteristics. **Mechanisms** – levers and linkages **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. **Mechanisms** – Pneumatics **Making** • 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. **Structures** – shell structures **Making** • Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use finishing techniques suitable for the product they are creating. **Structures** – shell structures using CAD	• Make, decorate and present the food product appropriately for the intended user and purpose. **Mechanisms** – pulleys or gears **Making** • 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. **Mechanisms** – cams **Making** • 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. **Textiles** – combining different fabric shapes **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 textiles according to their characteristics.	• Select from and use textiles according to their characteristics.	**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. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating. **Textiles** – 2D shape to 3D shape **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. **Electrical systems** – simple circuits and switches **Making** • 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.	• 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. **Textiles** – using CAD in textiles **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, including CAD, to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost. **Structures** – frame structures **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. **Structures** – Frame structures using CAD **Making**

			Electrical systems – simple programming and control **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.	• 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. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated models suitable for the product they are creating. **Electrical** systems – more complex switches and circuits **Making** • 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. **Electrical** systems – monitoring and control **Making** • Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. • Competently select and accurately assemble materials, and securely connect electrical

				components to produce a reliable, functional product. • Create and modify a computer control program to enable their electrical product to respond to changes in the environment.
Evaluating	**Food** – name prepare taste **Evaluating (N, R)** • Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences.(N) • Evaluate ideas and finished product (B'day cake) against design criteria, including intended user and purpose. (N) **Mechanisms** – Flap books **Evaluating (R)** • Explore a range of existing books and everyday products that use simple flaps (My Zoo)(R) • Evaluate their product by discussing how well it tastes/works in relation to the purpose and the user and whether it meets design criteria. (N) **Mechanisms** – wheels/ emergency vehicles **Evaluating (N)** • Explore and evaluate a range of products/toys with wheels • Evaluate through discussion their ideas against original criteria	**Food** – preparing fruit and veg **Evaluating** • Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria, including intended user and purpose. **Mechanisms** – sliders and levers **Evaluating** • Explore a range of existing books and everyday products that use simple sliders and levers. • Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria. **Mechanisms** – wheels and axels **Evaluating** • Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria. **Structures** – free standing structures **Evaluating** • Explore a range of existing freestanding structures in the	**Food** – healthy and varied diet **Evaluating** • Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs. • Evaluate the ongoing work and the final product with reference to the design criteria and the views of others. **Mechanisms** – levers and linkages **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. **Mechanisms** – Pneumatics **Evaluating** • Investigate and analyse books, videos and products with pneumatic mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make. **Structures** – shell structures	**Food** – celebrating culture and seasonality **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. **Mechanisms** – pulleys or gears **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.

	Structures – 2D/3D representations **Evaluating** • Explore a range of existing freestanding rocket structures and discuss key features. • Evaluate their product by discussing the key features that all examples have in common **Textiles** – characteristics, cutting and sticking **Evaluating** • Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout verbally and explain which characteristic made them select it	school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria. **Textiles** – Templates and joining **Evaluating** • Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Evaluate their ideas throughout and their final products against original design criteria.	**Evaluating** • Investigate and evaluate a range of existing shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose. **Structures** – shell structures using CAD **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. **Textiles** – 2D shape to 3D shape **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. **Electrical systems** – simple circuits and switches **Evaluating**	• Investigate famous manufacturing and engineering companies relevant to the project. **Mechanisms** – cams **Evaluating** • Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project. **Textiles** – combining different fabric shapes **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. **Textiles** – using CAD in textiles **Evaluating** • Investigate and analyse textile products linked to their final product.

			• Investigate and analyse a range of existing battery-powered products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work. **Electrical systems** – simple programming and control **Evaluating** • Investigate and analyse a range of existing battery-powered products, including pre-programmed and programmable products. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work.	• Compare the final product to the original design specification. • Test products with 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. **Structures** – frame structures **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. **Structures** – Frame structures using CAD **Evaluating** • Investigate and evaluate a range of frame 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. **Electrical** systems – more complex switches and circuits **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. **Electrical** systems – monitoring and control **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.
Technical Knowledge and Understanding	**Food** – name prepare taste **Technical knowledge and understanding** • Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. (R) • Understand which parts of the fruit/ veg can be eaten – skin, seed, flesh(R) • Know and use technical and sensory vocabulary relevant to the project. (N)(R) **Mechanisms** – flap books **Technical knowledge and understanding (R)** • Explore and use flaps • Understand that a flap can hide/ reveal text/pictures	**Food** – preparing fruit and veg **Technical knowledge and understanding** • Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. • Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The Eatwell Guide. • Know and use technical and sensory vocabulary relevant to the project. **Mechanisms** – sliders and levers **Technical knowledge and understanding** • Explore and use sliders and levers.	**Food** – healthy and varied diet **Technical knowledge and understanding** • Know how to use appropriate equipment and utensils to prepare and combine food. • Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught. • Know and use relevant technical and sensory vocabulary appropriately. **Mechanisms** – levers and linkages **Technical knowledge and understanding**	**Food** – celebrating culture and seasonality **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. **Mechanisms** – pulleys or gears **Technical knowledge and understanding**

	• Know and use technical vocabulary relevant to the project. **Mechanisms** – wheels/ emergency vehicles **Technical knowledge and understanding (N)** • Explore and use wheels on toys and emergency vehicles • Distinguish between fixed and freely moving wheels. • Know and use technical vocabulary relevant to the project. **Structures** – 2D>£D representations **Technical knowledge and understanding (R)** • Know how to make freestanding structures stronger, stiffer and more stable through independent learning/ experimentation. • Know and use technical vocabulary relevant to the project. **Textiles** – characteristics, cutting and sticking **Technical knowledge and understanding (N)** • Understand how simple collage textile products are made, • Understand how to attach fabrics to a back ground using different techniques e.g. glue, sticky tape	• Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project. **Mechanisms** – wheels and axels **Technical knowledge and understanding** • Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project. **Structures** – free standing structures **Technical knowledge and understanding** • Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project. **Textiles** – Templates and joining **Technical knowledge and understanding** • Understand how simple 3-D textile products are made, using a template to create two identical shapes. • Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. • Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.	• Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project. **Mechanisms** – Pneumatics **Technical knowledge and understanding** • Understand and use pneumatic mechanisms. • Know and use technical vocabulary relevant to the project. **Structures** – shell structures **Technical knowledge and understanding** • Develop and use knowledge of how to construct strong, stiff shell structures. • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Know and use technical vocabulary relevant to the project. **Structures** – shell structures using CAD **Technical knowledge and understanding** • 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.	• 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. **Mechanisms** – cams **Technical knowledge and understanding** • Understand that mechanical systems have an input, process and an output. • Understand how cams can be used to produce different types of movement and change the direction of movement. • Know and use technical vocabulary relevant to the project. **Textiles** – combining different fabric shapes **Technical knowledge and understanding** • A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics. • Fabrics can be strengthened, stiffened and reinforced where appropriate. **Textiles** – using CAD in textiles **Technical knowledge and understanding** • A 3D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.

	• Explore different finishing textures e.g., felt, feather, fur • Know and use technical vocabulary relevant to the project.	• Know and use technical vocabulary relevant to the project.	**Textiles** – 2D shape to 3D shape **Technical knowledge and understanding** • 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. **Electrical systems** – simple circuits and switches **Technical knowledge and understanding** • Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers. • Apply their understanding of computing to program and control their products. • Know and use technical vocabulary relevant to the project. **Electrical systems** – simple programming and control **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.	• Fabrics can be strengthened, stiffened and reinforced where appropriate. **Structures** – frame structures **Technical knowledge and understanding** • Understand how to strengthen, stiffen and reinforce 3D frameworks. • Know and use technical vocabulary **Structures** – Frame structures using CAD **Technical knowledge and understanding** • Develop and use knowledge of box and frame structures and, where appropriate, more complex 3D structures. • Develop and use knowledge of how to construct strong, stiff frame structures. • Know and use technical vocabulary relevant to the project. **Electrical** systems – more complex switches and circuits **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. **Electrical** systems – monitoring and control T**echnical knowledge and understanding**

				• Understand and use electrical systems in their products. • Understand the use of computer control systems in products. • Apply their understanding of computing to program, monitor and control their products. • Know and use technical vocabulary relevant to the project.
Vocabulary	**Food** – Name, prepare, taste **Glossary** •**Fruit** – plant or tree's edible seed with envelope. •**Vegetable** – plant used for food. •**Nutrients** – all the things in food that the body needs to remain healthy. •**Pith** – the soft white lining inside fruit such as oranges. •**Salad** – a cold dish of fresh and/or cooked vegetables or fruit •Stir. mix, pour, bake, healthy, unhealthy **(N)** •grow, farmer, trees, soil, crops, (R) •**Sensory evaluation** – subjective testing of foods where senses are used to evaluate qualities such as appearance, smell, taste, texture (mouth feel). (R, N) **Mechanisms** – flap books **Glossary**	**Food** – preparing fruit and veg **Glossary** •**Fruit** – plant or tree's edible seed with envelope. •**Vegetable** – plant used for food. •**Nutrients** – all the things in food that the body needs to remain healthy. •**Pith** – the soft white lining inside fruit such as oranges. •**Salad** – a cold dish of fresh and/or cooked vegetables or fruit. •**Sensory evaluation** – subjective testing of foods where senses are used to evaluate qualities such as appearance, smell, taste, texture (mouth feel). •**Kebab** – cooked and/or fresh ingredients on a skewer. **Mechanisms** – sliders and levers **Glossary** • **Mechanism** – a device used to create movement in a product. • **Lever** – a rigid bar which moves around a pivot. Levers are used in many everyday products. In this project children will use card strips for levers and paper fasteners for pivots.	**Food** – healthy and varied diet **Glossary** •**Appearance** – how the food looks to the eye. •**Texture** – how the product feels in the mouth. •**Sensory evaluation** – evaluating food products in terms of the taste, smell, texture and appearance. •**Preference test** – trying different foods and deciding which you like best. •**Strawberry huller** – tool to remove the stalk and leaves from a strawberry •**Processed food** – ingredients that have been changed in some way to enable them to be eaten or used in food preparation and cooking. **Mechanisms** – levers and linkages **Glossary** • **Mechanism** – a device used to create movement in a product. • **Lever** – a rigid bar which moves around a pivot. Levers are used in many everyday products. In this	**Food** – celebrating culture and seasonality **Glossary** • **Finishing** – related to the appearance of the product – shape, decoration and colour. • **Rubbing in** – rubbing the dry ingredients together with the fat, lifting to put air into the mixture, so that it resembles fine breadcrumbs. • **Knead** – pulling and squeezing dough to make it smooth. • **Bran** – the hard, protective shell of a grain of wheat. • **Dough** – a mixture of flour, yeast and water before it is cooked. • **Endosperm** – the store of food inside a seed. • **Germ** – part of the seed where the root and shoots grow from. • **Yeast** – a tiny plant which makes bubbles of carbon dioxide when mixed with flour and warm water • **Unleavened bread** – flat bread where yeast has not been added.

	• **Mechanism** – a device used to create movement in a product. • flap • cover/ uncover, scissors, materials, card, paper, glue, sticky tape, (R) **Mechanisms** – wheels/ emergency vehicles **Glossary** • Wheel • Round • Smooth • Move/ stuck • vehicle **Structures** – 2D?3D representations **Glossary** • **Freestanding structure** – a structure that stands on its own foundation or base without attachment to anything else. • **Stability** – in relation to a freestanding structure, the extent to which it is likely to fall over if a force is applied. • **s**pace, rocket, wings, blast off, paper, card. Glue. Sticky tape, recycled material, **Textiles** – Templates and joining **Glossary** • name of farm animals, textures (e.g. soft, fluffy, smooth, hairy) • Cut stick cover • Glue, card, paper, sticky tape, material	• **Slider** – a rigid bar which moves backwards and forwards along a straight line. Unlike a lever, a slider does not have a pivot point. • **Slot** – the hole through which a lever or slider is placed to enable part of a picture to move. • **Guide or bridge** – a short card strip used to keep sliders in place and control movement. **Mechanisms** – wheels and axels **Glossary** • **Axle** – a rod on which one or more wheels can rotate, either freely or be fixed to and turn with the axle. • **Axle holder** – the component through which an axle fits and rotates. • **Chassis** – the frame or base on which a vehicle is built. • **Friction** – resistance which is encountered when two things rub together. • **Dowel** – wooden rods used for making axles to hold wheels. **Structures** – free standing structures **Glossary** • **Freestanding structure** – a structure that stands on its own foundation or base without attachment to anything else. • **Frame structure** – a structure made from thin components e.g. tent frame. • **Shell structure** – a hollow structure with a thin outer covering.	project children will use card strips for levers and paper fasteners for pivots. • **Linkage** – the card strips joining one or more levers to produce the type of movement required. The term 'linkage' is also used to describe the lever and linkage mechanism as a whole. • **Slot** – the hole through which a lever is placed to enable part of a picture to move. • **Guide or bridge** – a short card strip used to keep lever and linkage mechanisms in place and control movement. • **Loose pivot** – a paper fastener that joins card strips together. • **Fixed pivot** – a paper fastener that joins card strips to the backing card. • **System** – a set of related parts or components used to create an outcome. Systems have an input, process and an output. In a lever and linkage mechanism, the 'input movement' is where the user pushes or pulls a card strip. The 'output movement' is where one or more parts of the picture move. **Mechanisms** – Pneumatics **Glossary** • **Compressed** – something that is squashed, such as air in a tube. • **Input** – what goes into a system. • **Output** – what comes out of a system. • **Pivot** – a point about which a lever turns.	**Mechanisms** – pulleys or gears **Glossary** • **Pulley** – a grooved wheel over which a drive belt can run. • **Gear** – a wheel with teeth around its circumference. • **Drive belt** – the belt which connects and transfers movement between two pulleys. • **Gearing up or down** – changing the rotational speed of a product by the use of pulleys or gears. When a small pulley or gear is used to drive a larger one the rotational speed is reduced and the product has been geared down. • **Mechanical system** – a set of related parts or components used to create movement. • **Driver** – the gear or pulley that provides the input movement to the system. • **Follower** – the gear or pulley that provides the output movement to the system. • **Mesh** – the point where two gears join together and transfer movement. • **Motor spindle** – the rod on the end of the motor onto which a gear or pulley is attached. **Mechanisms** – cams **Glossary** • **Rotary motion** – movement that goes round. • **Oscillating motion** – moving to and fro around a pivot point, as in a lever.

		• **Stability** – in relation to a freestanding structure, the extent to which it is likely to fall over if a force is applied. • **Buttress** – a structure added to a wall, tower or framework to make it more stable and/or reinforce it. • **Brick bonding** – arranging bricks in a wall to improve the performance of the structure or improve its appearance. • **Mock-up** – 3-D representation of a product. **Textiles** – Templates and joining **Glossary** • **Appliqué** – to attach a decorative fabric item onto another piece of fabric by gluing and/or sewing. • **Design** – to generate, develop and communicate ideas for a product. • **Embroider** – to decorate fabric with stitches. • **Evaluate** – to judge how a product meets chosen criteria. • **Fray** – to unravel or become worn at the edge. • **Glove puppet** – a glove puppet fits over the hand, and the fingers operate its head and arms. • **Mock-up** – a model which allows children to try out ideas using cheaper materials and temporary joints. • **Seam** – a row of stitches joining two pieces of fabric. • **Sew** – to join pieces of fabric with stitches.	• **Lever** – a beam which turns about a point. • **Pneumatic** – a system that works using gases (air). • **Hydraulic** – a system that works using liquids (water). • **Pressure** – the force used on an object or surface. • **Inflate** – fill something with air or a gas to make it swell up. • **Deflate** – remove the pressurised air to allow an object like a balloon to shrink. • **Syringe** – a tube with a nozzle and plunger for sucking and blowing air or liquids. • **System** – a set of related parts or components used to create an outcome. Systems have an input, process and an output. In a pneumatic system, the 'input movement' is where the user pushes or pulls a syringe or pump. The 'output movement' is where the object at the end of the tube moves. **Structures** – shell structures **Glossary** • **Cuboid** – a solid body with rectangular sides. • **Edge** – where two surfaces meet at an angle. • **Face** – a surface of a geometric shape. • **Font** – a printer's term meaning the style of lettering being used. • **Net** – the flat or opened-out shape of an object such as a box.	• **Reciprocating motion** – backwards and forwards movement in a straight line, as in a slider. • **Cam** – a mechanism that changes one sort of movement to another. Cams can be an off-centre wheel or a specially shaped wheel. • **Follower** – the device that follows the movement of the cam: a lever or a slider. • **Lever** – a piece of rigid material that moves to and fro around a pivot point creating oscillating motion. • **Slider** – a piece of rigid material that moves backwards and forwards in a straight line creating reciprocating motion. • **Guide** – a piece of material used to guide the movement of another. • **Spacer** – a piece of material used to create extra space to allow moving parts to move freely. **Textiles** – combining different fabric shapes **Glossary** • **Mock up** – quick 3-D modelling using easy to work and cheaper materials and temporary joints. Useful for checking proportions and scale. • **Pattern or template** – a shape drawn to exact shape and size, used to assist in cutting out. • **Seam allowance** – extra fabric allowed for joining together - 15mm for domestic patterns.

		• **Template** – a shape drawn to assist in cutting out shapes.	• **Prism** – a solid geometric shape with ends that are similar, equal and parallel. • **Scoring** – cutting a line or mark into sheet material to make it easier to fold. • **Shell structure** – a hollow structure with a thin outer covering. • **Vertex** – used to refer to the corners of a solid geometric shape, where edges meet. **Structures** – shell structures using CAD **Glossary** • **CAD** – computer-aided design. • **Shell structure** – a hollow structure with a thin outer covering. • **Edge** – where two surfaces meet at an angle. • **Face** – a surface of a geometric shape. • **Vertex** – the corners of a geometric shape where edges meet. • **Font** – a printer's term meaning the style of lettering being used. • **Net** – the flat or opened-out shape of an object such as a box. • **Cuboid** – a solid body with rectangular sides. • **Prism** – a solid geometric shape with ends that are similar, equal and parallel. **Textiles** – 2D shape to 3D shape	• **Specification** – describes what a product has to do. • **Tacking** – large running stitches to hold pieces of fabric together temporarily. • **Working drawing** – detailed drawing contains all information needed to make a product but is updated as changes are made. **Textiles** – using CAD in textiles **Glossary** • **Mock up** – quick 3D modelling using easy to work materials. Useful for checking proportions and scale. • **Pattern/template** – a shape drawn to exact shape and size. • **Seam allowance** – extra fabric allowed for joining, usually 15mm. • **Specification** – this describes what a product has to do. • **Tacking** – large running stitches to hold pieces of fabric together temporarily. • **Working drawing** – detailed drawing contains all information needed to make the product. • **CAD** – computer-aided design. • **CAM** – computer-aided manufacture. **Structures** – frame structures **Glossary** • **Modelling** – the process of making a 3-D representation of a structure or product. • **Compression** – the application of pressure to squeeze an object.

			Glossary • **Appliqué** – means 'applied' - describes method of stitching/gluing patches onto fabric (originally to mend holes in worn clothes) to provide decoration. • **Pattern/Template** – a shape drawn to exact shape and size and used to assist cutting out. • **Seam** – a line of stitching that joins pieces of fabrics together. • **Seam Allowance** – extra fabric allowed for joining together - usually 1.5cm. • **Prototype** – a model that is made to test whether a design will work. • **Aesthetics** – the way in which the product looks with the nature and expression of beauty. **Electrical systems** – simple circuits and switches **Glossary** • **Circuit** – path through which electricity passes. • **Conductor** – a material which allows an electric current to pass through it. • **Insulator** – a material which does not easily allow electric current to pass through it. • **Prototype** – a model made to test whether a design will work. • **Push-to-break switch** – a switch turned off by pressing it. • **Push-to-make switch** – a switch turned on by pressing it.	• **Strut** – a part of a structure under compression. • **Tension** – a force pulling on a material or structure. • **Tie** – a part of a structure under tension. • **Diagonal** – a straight line that goes from one corner to another inside a shape. • **Horizontal** – a line that is parallel to the ground. • **Vertical** – a line that is at right angles to the ground. • **Triangulation** – the use of triangular shapes to strengthen a structure. • **Frame structure** – a structure made from thin components e.g. tent frame. **Structures** – Frame structures using CAD **Glossary** • **CAD** – computer-aided design. • **Frame structure** – a structure made from thin components such as a tent. • **Handle** – a point on a 3D object that can be grabbed to move or resize it. • **Dimension** – the sizes of objects or components. • **Workplane** – the flat surface for constructing CAD models. • **Triangulation** – using triangular supports to make a frame stronger.

			• **Reed switch** – a switch operated by a magnet. • **Toggle switch** – a switch operated when a lever is pressed. • **System** – a set of related parts or components that together achieve a desired outcome. • **Output devices** – components that produce an outcome e.g. bulbs and buzzers. • **Input devices** – components that are used to control an electrical circuit e.g. switches. **Electrical systems** – simple programming and control **Glossary** • **Program** – a sequence of instructions that can be used to control electrical components. • **Microcontroller** – a device that can be programmed to control how an electrical product operates. • **Light emitting diode (LED)** – an output device that glows when electricity is passed through it. • **System** – a set of related parts or components that together achieve a desired outcome. • **Output devices** – components that produce an outcome e.g. bulbs, motors and buzzers. • **Input devices** – components that are used to control an electrical circuit e.g. switches. • **Process** – how a computer program controls one or more output devices.	• **Compression** – the squashing force acting on an object or structure. • **Tension** – the stretching force acting on an object or structure • **CAM** – Computer Aided Manufacture, machines linked to CAD software. **Electrical** systems – more complex switches and circuits **Glossary** • **Modelling** – to realise and manipulate ideas in a tangible form. • **Open switch** – when a switch is positioned such that electricity cannot flow through it. • **Closed switch** – when a switch is positioned such that electricity can flow through it. • **Normally open** – the term used to describe when a switch is in the off position, i.e. the switch is open and no electricity can flow when the button on not pressed. • **Normally closed** – the term used to describe when a switch is in the on position i.e. the switch is closed and electricity can flow when the button is not pressed • **Computer control input** – when a switch, such as a micro switch, sends a signal to a computer control box to activate a sequence of events such as a buzzer or light being used to attract attention or alert people.

				• **Output devices** – components that produce an outcome e.g. bulbs and buzzers. • **Input devices** – components that are used to control an electrical circuit e.g. switches or sensors. **Electrical** systems – monitoring and control **Glossary** • **Program** – a sequence of instructions that can be used to control electrical components. • **Microcontroller** – a device that can be programmed to control how an electrical product operates. • **Light emitting diode (LED)** – an output device that glows when electricity is passed through it. • **System** – a set of related parts or components that together achieve a desired outcome. • **Output devices** – components that produce an outcome e.g. bulbs, motors and buzzers. • **Input devices** – components that are used to control an electrical circuit e.g. switches. • **Process** – how a computer program controls one or more output devices.