Fairway Primary School

Design and Technology Long Term Planning

EXPLORE ---KNOW---COMMUNICATE

CONCEPTS

AUDIENCE
Children should have a clear idea of who they are designing and making products for, considering their needs, wants, interests or preferences. The user could be themselves, an imaginary character, another person, client, consumer or a specific target audience.
PURPOSE
Children should know what the products they design and make are for. Each product should perform a clearly defined task that can be evaluated in use.
FUNCTIONALITY
Children should design and make products that function in some ways to be successful. Products often combine aesthetic qualities with functional characteristics. In Design and Technology, it is insufficient for children to design and make products which are purely aesthetic.

SUBJECT CONTENT EYFS

The statutory EYFS framework aims to ensure that all pupils reach the early learning goal of:

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

SUBJECT CONTENT KS1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making (an iterative process is the relationship between a pupil's ideas and how they are communicated and clarified through activity). They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught 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.

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:

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

SUBJECT CONTENT KS2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making (an iterative process is the relationship between a pupil's ideas and how they are communicated and clarified through activity). They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught 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:

- 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.

YEAR 1

DESIGN AND TECHNOLOGY SKILLS (taught throughout the year)

DESIGN	MAKE	EVALUATE
• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through • talking, drawings and mock-ups.	• Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating.	• Explore a range of existing books and everyday products that use simple sliders and levers. • Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.

COOKING STRAND

DESIGN	MAKE	EVALUATE
• 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.	• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. • Select from a range of fruit according to their characteristics e.g. colour, texture and taste to create a chosen product.	• Taste and evaluate a range of fruit to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria, including intended user and purpose.

	DESIGN AND TECHNOLOGY BLOCK 1 (3 weeks)	DESIGN AND TECHNOLOGY BLOCK 2 (3 weeks)	COOKING AND NUTRITION
UNIT	SLIDERS AND LEVERS (MECHANISMS)	FREESTANDING STRUCTURES (STRUCTURES)	FRUIT SNACK
PROJECT	Design, make and evaluate a moving story board to retell a story to your class.	Design, make an evaluate furniture for characters in a story. e.g. chairs for the three bears	Design, make and evaluate a fruit snack for a teddy bear class picnic. e.g. Fruit salads, yogurts, jellies, smoothies
CONCEPTS	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality
NATIONAL CURRICULUM OBJECTIVES	**When designing and making pupil should be taught 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.		**Pupils should be taught to:** • Use the basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from.

TECHNICAL KNOWLEDGE	**Technical knowledge and understanding** • Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	**Technical knowledge and understanding** • Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project.	**Technical knowledge and understanding** • Understand where a range of fruit 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 is part of *The Eatwell Guide*. • Know and use technical and sensory vocabulary relevant to the project.
VOCABULARY	slider, lever, pivot, slot, bridge/guide card, masking tape, paper fastener, join pull, push, up, down, straight, curve, forwards, backwards design, make, evaluate, user, purpose, ideas, design criteria, product, function	cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder design, make, evaluate, user, purpose, ideas, design criteria, product, function	

YEAR 2

DESIGN AND TECHNOLOGY SKILLS(taught throughout the year)

DESIGN	MAKE	EVALUATE
• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through talking, drawings and mock-ups. • Design a functional and appealing product for a chosen user and purpose based on simple design criteria.	• Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting and joining and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics. • Select from and use textiles according to their characteristics.	• Explore and evaluate a range of existing textile products relevant to the project being undertaken. • Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their final products against original design criteria.

COOKING STRAND

DESIGN	MAKE	EVALUATE
• 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	• Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. • Select from a range of vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.	• Taste and evaluate a range of vegetables to determine the intended user's preferences. • Evaluate ideas and finished products against design criteria, including intended user and purpose.

	DESIGN AND TECHNOLOGY BLOCK 1 (3 weeks)	DESIGN AND TECHNOLOGY BLOCK 2 (3 weeks)	COOKING AND NUTRITION
UNIT	WHEELS AND AXLES (MECHANISMS)	TEMPLATES AND JOINING TECHNIQUES (TEXTILES)	SALAD
PROJECT	Design, make and evaluate a push/pull vehicle that will carry equipment for a character in a story	Design, make and evaluate a hand puppet/finger puppet to perform a play to some of your friends.	Design, make and evaluate a vegetarian salad for Miss White.
CONCEPTS	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality
NATIONAL CURRICULUM OBJECTIVES	**When designing and making pupil should be taught 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.		**Pupils should be taught to:** • Use the basic principles of a healthy and varied diet to prepare dishes • Understand where food comes from

TECHNICAL KNOWLEDGE	**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. • Know and use technical vocabulary relevant to the project.	**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.	**Technical knowledge and understanding** • Understand where a range of 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 vegetables are part of *The Eatwell Guide*. • Know and use technical and sensory vocabulary relevant to the project.
VOCABULARY	-names of existing products, joining and finishing techniques, tools, fabrics and components -template, pattern pieces, mark out, join, decorate, finish -features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function	vehicle, wheel, axle, axle holder, chassis, body, cab -assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism -names of tools, equipment and materials used -design, make, evaluate, purpose, user, criteria, functional	

YEAR 3

DESIGN AND TECHNOLOGY SKILLS (taught throughout the year)

DESIGN	MAKE	EVALUATE
• 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.	• Order the main stages of making. • Select and use appropriate tools to measure, mark out, cut, score, shape, join and assemble with some accuracy. • Select from and use finishing techniques suitable for the product they are creating. • Explain their choice of materials according to functional properties and aesthetic qualities. • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.	• Investigate and analyse books and, where available, other products with lever and linkage mechanisms. • 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, as they design and make.

COOKING STRAND

DESIGN	MAKE	EVALUATE
• 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.	• 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.	• 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.

	DESIGN AND TECHNOLOGY BLOCK 1 (3 weeks)	DESIGN AND TECHNOLOGY BLOCK 2 (3 weeks)	COOKING AND NUTRITION	COMPUTING and MONITORING/CONTROL
UNIT	LEVERS AND LINKAGES (MECHANICAL SYSTEMS)	SHELL STRUCTURES (STRUCTURES)	BREAD ROLL	Lego WeDo Spring 1 (1 day) Summer 2 (1 day)
PROJECT	Design, make and evaluate a greeting card with moving parts for family/friends.	Design, make and evaluate packaging for a gift for a family member.	Design, make and evaluate a bread roll with a filling for their lunch.	Milo the Science Rover Milo's Motion Sensor Glowing Snail Milo's Tilt Sensor
CONCEPTS	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality

NATIONAL CURRICULUM OBJECTIVES	**When designing and making, pupils should be taught 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; (Computing) • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Computing)

TECHNICAL KNOWLEDGE	**Technical knowledge and understanding** • Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.	**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.	**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.	**Technical knowledge and understanding** • Know how to follow a set of visual instructions on Lego WeDo 2.0 • Develop and use the Lego components to then connect to the Smart hub and program using Lego WeDo • Take a picture with the capture tool • Know and use technical vocabulary relevant to the project.
VOCABULARY	mechanism, lever, linkage, pivot, slot, bridge, guide -system, input, process, output -linear, rotary, oscillating, reciprocating -user, purpose, function -prototype, design criteria, innovative, appealing, design brief	-shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity -marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating -font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype		Motor, motion sensor, program, speed, direction, time, tilt sensor, LED, smart hub

YEAR 4

DESIGN AND TECHNOLOGY SKILLS (taught throughout the year)

DESIGN	MAKE	EVALUATE
• Gather information about needs and wants, and develop design criteria to inform the design of products • Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s. • Develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches, cross-sectional and exploded diagrams. • Produce annotated sketches, prototypes, final product sketches and pattern pieces.	• Plan and 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 fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern. • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.	• Investigate and analyse a range of existing battery-powered products. • 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. • Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work. • Take into account others' views. • Understand how a key event/individual has influenced the development of the chosen product and/or fabric.

COOKING STRAND

DESIGN	MAKE	EVALUATE
• 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.	• 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.	• 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.

	DESIGN AND TECHNOLOGY BLOCK 1 (3 weeks)	DESIGN AND TECHNOLOGY BLOCK 2 (3 weeks)	COOKING AND NUTRITION	COMPUTING and MONITORING/CONTROL
UNIT	2D SHAPE TO 3D PRODUCT (TEXTILES)	SIMPLE CIRCUITS AND SWITCHES (ELECTRICAL SYSTEMS)	PIZZA	Lego WeDo Spring 1 (1 day) Summer 2 (1 day)
PROJECT	Design, make and evaluate a holder for themselves. e.g. a purse / pencil case / mirror / card holder	Design, make and evaluate a night light for a brother, sister or friend.	Design, make and evaluate a pizza with toppings for their family members.	Spy Robot Collaboration Frog's Metamorphosis
CONCEPTS	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality

NATIONAL CURRICULUM OBJECTIVES	**When designing and making, pupils should be taught 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; (Computing) • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Computing)

TECHNICAL KNOWLEDGE	**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.	**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.	**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.	**Technical knowledge and understanding** • Know how to follow a set of visual instructions on Lego WeDo 2.0 • Develop and use the Lego components to then connect to the Smart hub and program using Lego WeDo • Take a picture with the capture tool • Know and use technical vocabulary relevant to the project.
VOCABULARY	fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance -user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces	-series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip -control, program, system, input device, output device -user, purpose, function, prototype, design criteria, innovative, appealing, design brief		Motor, motion sensor, program, speed, direction, time, tilt sensor, LED, smart hub, light, collaborate, habitat,

YEAR 5

DESIGN AND TECHNOLOGY (Taught throughout the year)

DESIGN	MAKE	EVALUATE
• Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop and communicate ideas through discussion, prototypes, annotated sketches, exploded drawings and drawings from different views (where appropriate) • Develop a simple design specification to guide their thinking. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost.	• Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources (tools, equipment, materials) to be used (if appropriate, allocate tasks within a team) • 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. • 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. • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.	• Research key events and individuals relevant to frame structures. • Investigate and evaluate a range of existing frame structures. • Investigate famous manufacturing and engineering companies relevant to the project. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Consider the views of others to improve their work.
COOKING STRAND		
DESIGN	**MAKE**	**EVALUATE**
• 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.	• 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.	• 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.

	DESIGN AND TECHNOLOGY BLOCK 1 (3 weeks)	DESIGN AND TECHNOLOGY BLOCK 2 (3 weeks)	COOKING AND NUTRITION	COMPUTING and MONITORING/CONTROL
UNIT	CAMS (MECHANICAL STRUCTURES)	FRAME STRUCTURES (STRUCTURES)	SAVOURY SCONES/MUFFINS	Lego WeDo Spring 1 (1 day) Summer 2 (1 day)
PROJECT	Design, make and evaluate a moving toy for children in reception. e.g. showing a nursery rhyme	Design, make and evaluate a small- scale bird hide for children to use in the school wildlife area.	Design, make and evaluate a savoury scone/ muffin for their family.	Prevent Flooding Moon Base
CONCEPTS	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality

NATIONAL CURRICULUM OBJECTIVES	**When designing and making, pupils should be taught 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; (Computing) • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Computing) • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (Computing)

TECHNICAL KNOWLEDGE	**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.	**Technical knowledge and understanding** • Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.	**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.	**Technical knowledge and understanding** • Know how to follow a set of visual instructions on Lego WeDo 2.0 • Develop and use the Lego components to then connect to the Smart hub and program using Lego WeDo • Take a picture with the capture tool • Use video tool • Know and use technical vocabulary relevant to the project.
VOCABULARY	-cam, snail cam, off-centre cam, peg cam, pear shaped cam -follower, axle, shaft, crank, handle, housing, framework -rotation, rotary motion, oscillating motion, reciprocating motion -annotated sketches, exploded diagrams -mechanical system, input movement, process, output movement -design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent -design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional		Motor, motion sensor, program, speed, direction, time, tilt sensor, LED, smart hub, light, collaborate, habitat, floodgate, display background, sound sensor,

YEAR 6

DESIGN AND TECHNOLOGY SKILLS (taught throughout the year)

DESIGN	MAKE	EVALUATE
• 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 innovative ideas by carrying out research including surveys, interviews and questionnaires and clarifying these through discussion. • Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams. • 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.	• Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. If appropriate, allocate tasks within a team. • 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. • 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.	• 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. • 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.

COOKING STRAND

DESIGN	MAKE	EVALUATE
• 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.	• 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.	• 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.

	DESIGN AND TECHNOLOGY BLOCK 1 (3 weeks)	DESIGN AND TECHNOLOGY BLOCK 2 (3 weeks)	COOKING AND NUTRITION	COMPUTING and MONITORING/CONTROL
UNIT	MORE COMPLEX SWITCHES AND CIRCUITS (ELECTRICAL SYSTEMS)	COMBINING DIFFERENT FABRIC SHAPES (TEXTILES)	SWEET BISCUITS	Lego WeDo Spring 1 (1 day) Summer 2 (1 day)
PROJECT	Design, make and evaluate an electrical quiz board for Y4 to play.	Design, make and evaluate a hat to advertise the need for us all to recycle.	Design, make and evaluate a sweet biscuit for a particular celebration eg wedding, birthday, Easter, Christmas, Eid etc	Volcano Alert Grabbing Objects
CONCEPTS	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality	Audience Purpose Functionality

NATIONAL CURRICULUM OBJECTIVES	**When designing and making, pupils should be taught 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment. • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; (Computing) • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Computing) • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (Computing)

TECHNICAL KNOWLEDGE	• 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.	**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. • Know and use technical vocabulary relevant to the project.	**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.	**Technical knowledge and understanding** • Know how to follow a set of visual instructions on Lego WeDo 2.0 • Develop and use the Lego components to then connect to the Smart hub and program using Lego WeDo • Take a picture with the capture tool • Use video tool • Know and use technical vocabulary relevant to the project.
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		Motor, motion sensor, program, speed, direction, time, tilt sensor, LED, smart hub, light, collaborate, habitat, floodgate, display background, sound sensor, alarm, activated, emit. Robotic, artificial