Pott Shrigley Church School
Design and Technology Long Term Plan

The EYFS Profile

Expressive Arts and Design Creating with Materials ELG aims to ensure that children will have the experience to:

♣ 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.

Fine Motor Skills ELG aims to ensure that children will have the experience to:

♣ Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases.

♣ Use a range of small tools, including scissors, paint brushes and cutlery.

♣ Begin to show accuracy and care when drawing.

Aims of the National Curriculum

The national 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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply, and understand the matters, skills and processes specified in the relevant programme of study.

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Key stage 1

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. 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.

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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

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.

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.

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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 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.

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Cycle A

EYFS/Y1		
Autumn 2	**Spring 2**	**Summer 2**
Weathervanes **Freestanding structures**	**Moving pictures** **Sliders and levers**	**Seaside Picnics** **Cooking and nutrition**
Key learning objectives • To learn what a structure is and think about structures that they know. • To think about what materials could be used to build a freestanding structure. • To learn what a weathervane is and what it is used for. • To work in groups to design a simple weathervane thinking about what materials they could use to make it strong and stable. • To make a weathervane using different materials, thinking about different attachment techniques. • To test their final design, discussing what works well and what could be improved.	**Key learning objectives** • To explore books that have moving parts and think about which parts move and how they work. • To learn what a slider mechanism is and how it can be attached to something to make it move. • To design a background scene and two superhero characters for our moving pictures. • To cut a line in the background scene and attach a slider mechanism to the back of one of the characters. • To assemble by putting the slider through the slit in the scene and move the character by sliding the lever. • To learn what a lever mechanism is and that the lever turns around a pivot and the pivot is a point about which a lever turns. • To use a lever and split pin to create a lever mechanism for the second character. • To discuss how well the slider and lever mechanisms worked and what they would change next time.	**Key learning objectives** • To begin to understand the food groups and why it is important to have a healthy and balanced diet. • To begin to think about why it is important to learn how to prepare and cook meals. • To discuss why it is important to eat food from each group thinking about the jobs the different food groups do. • To work in small groups to plan a seaside picnic lunch including food from each of the food groups using a food group chart to help. • To make a simple seaside picnic lunch using the plan. • To eat the lunch and then talk about what they enjoyed about making it.

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Curriculum objectives	**Curriculum objectives**	***Curriculum objectives***
EYFS – Expressive Arts and Design Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills. ***Physical Development - Fine Motor Skills*** Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons. Combine different movements with ease and fluency. ***KS1*** *- Design purposeful, functional, appealing products for themselves and other users based on design criteria.* *Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.* *Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.*	**EYFS –** ***Expressive Arts and Design*** Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills. ***Physical Development - Fine Motor Skills*** Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons. Combine different movements with ease and fluency. **KS1 -** *Design purposeful, functional, appealing products for themselves and other users based on design criteria.* *Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.* *Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.*	***EYFS – Expressive Arts and Design*** Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to and build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills. ***Physical Development - Fine Motor Skills*** Develop their small motor skills so that they can use a range of tools competently, safely and confidently. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons. Combine different movements with ease and fluency. ***KS1 -*** *Use the basic principles of a healthy and varied diet to prepare dishes.* *Understand where food comes from.*

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. *Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.* *Build structures, exploring how they can be made stronger, stiffer, and more stable.*	*Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.* *Explore and use mechanisms [for example, levers, sliders, wheels, and axles], in their products.*	

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Cycle B

EYFS/Y1		
Autumn 2	**Spring 2**	**Summer 2**
Bridges **Freestanding structures**	**Animal Puppets** **Textiles**	**Sensational Salads** **Cooking and nutrition**
Key learning objectives • To explore examples of different types of bridges and understand that engineers design and build them. • To think about and discuss how bridges are strong and can hold heavy vehicles. • To explore what materials bridges are made from and why. • To look at what a beam bridge is and test what would happen if we put too much weight on it. • To look at different bridge designs and think about how we can make our beam bridge stronger. • To work in small groups to design a functional bridge thinking about the shape and strength. • To build the bridge attaching each component, thinking about how to make it strong. • To test the strength of the bridge using toy vehicles. • To evaluate the bridge again the design criteria.	**Key learning objectives** • To explore a range of fabrics and name them. • To think and discuss how the fabrics look and feel. • To explore how fabrics are assembled to make things such as clothes and toys. • To look at an example of a fabric animal puppet and explore what materials are needed to make it. • To design a simple animal template tracing round our hands on tracing/baking paper to use to cut out felt to make our own animal puppets. • To use shapes to cut out eyes, a nose, and a mouth for our animal puppets. • EYFS to use fabric glue to stick the puppet together. • Year 1 to learn a simple running/hemming stitch to sew the outline of their puppet. • To create a puppet show using the puppets and then evaluate our finished product, thinking about what worked well and what could be improved.	**Key learning objectives** • To understand where food comes from and name a variety of food from the different food groups. • To understand that some fruit and vegetables are seasonal. • To understand that some fruit and vegetables grow above ground and some grow below ground. • To work in small groups to plan a healthy seasonal salad including eggs from the local farm visit. • To understand food hygiene rules when preparing meals. • To prepare a simple salad by combining and assembling ingredients. • To use kitchen equipment safely when preparing food. • To taste and evaluate my sensational salad.

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Curriculum objectives	Curriculum objectives	Curriculum objectives
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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. *Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.* *Build structures, exploring how they can be made stronger, stiffer, and more stable.*	*Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.*	

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Cycle A

Year 2/3		
Autumn 2	**Spring 2**	**Summer 2**
Afternoon Tea **Cooking and nutrition**	**Fire Engines** **Wheels and axles**	**Rivers** **Sliders and levers**
Key learning objectives • To learn the history of afternoon tea and Victoria Sponge cake. • To look at examples of afternoon tea menus to understand what food you would normally have. • To design an afternoon tea menu for a member of the Royal Family considering the different food groups. • To discuss each menu and decide on a whole class menu that we will create. • To work in small groups to create each element of the afternoon tea. • To implement food hygiene and kitchen preparation rules to ensure a safe environment for all. • To design and create invitations to invite the Teaching Assistants to join them for afternoon tea. • To assemble and present the afternoon tea, using their own creativity on how to display it. • To use an evaluation form to think about what worked well and what could be improved.	**Key learning objectives** • To explore toy cars to think about how they move when pushed and pulled. • To think about how the wheels all turn in the same direction when doing this. • To learn that the wheels all move at the same time and at the same speed because each pair of wheels is attached to a pole called an axle and that real vehicles have axles. • To understand that the first fire services were created after the G • To design a fire engine that is functional and appealing. • To use a variety of materials to create the fire engine thinking about where the wheels and axles will need to be placed. • To learn what a chassis is and understand that the axle needs to be secured to it for the wheels to move. • To test the vehicles and see how far they can travel and if the wheels work at the same time. • Let peers test your final design and receive feedback on ways in which it could be developed further.	**Key learning objectives** • To recall prior information and key vocabulary on sliders and levers. • To explore examples of sliders and levers and investigate which part is the mechanism. • To work in groups to design a river scene and plan which parts they are going to create movement with by using sliders and levers. • To annotate plans through group discussion. • To explore a range of materials to help make design decisions based on functionality and aesthetics. • To create a moving part using a slider based on the design decisions made. • To create a moving part using a lever based on the design decisions made. • To test their designs and evaluate against the design criteria. • To show their designs to the rest of the class and provide and receive peer feedback on what worked well and what could be improved.

	• Provide feedback to others on their final design.	
Curriculum objectives ***KS1*** **-** *Use the basic principles of a healthy and varied diet to prepare dishes.* *Understand where food comes from.* ***KS2*** **-** *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.*	**Curriculum objectives** **KS1 -** *Design purposeful, functional, appealing products for themselves and other users based on design criteria.* *Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.* *Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.* *Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.* *Explore and use mechanisms [for example, levers, sliders, wheels, and axles], in their products.* ***KS2*** **-** *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.* *Select from and use a wider range of tools and equipment to perform practical tasks [for*	**Curriculum objectives** **KS1 -** *Design purposeful, functional, appealing products for themselves and other users based on design criteria.* *Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.* *Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.* *Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.* *Explore and use mechanisms [for example, levers, sliders, wheels, and axles], in their products.* **KS2 -** *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.* *Select from and use a wider range of tools and equipment to perform practical tasks [for*

	example, cutting, shaping, joining, and finishing], accurately. *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.* *Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers, and linkages].*	*example, cutting, shaping, joining, and finishing], accurately.* *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.* *Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers, and linkages].*

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Cycle B

Year 2/3		
Autumn 2	**Spring 2**	**Summer 2**
Hearty Soups **Cooking and nutrition**	**Flags of the UK** **Textiles**	**Mountain Lifts** **Pulleys and gears**
Key learning objectives • To recall prior information about the food groups. • To learn that food is seasonal and explore what vegetables are available in Autumn. • To explore and taste a range of soups and think about what ingredients have been used. • To work in groups to plan a seasonal soup recipe including five different vegetables. • To explore where we could source our ingredients from thinking about supporting our local village and shops. • To make a hearty, seasonal soup, thinking about food hygiene and safe kitchen preparation. • To serve and taste our soups, evaluating how well our recipe has worked. • To annotate our recipes, thinking about any changes or improvements we would make.	**Key learning objectives** • To learn what each of the flags looks like for England, Northern Ireland, Scotland, and Wales. • To explore and discuss examples of flags and how they are made. • To look at the stitching details on flags and think about how we can create a flag. • To explore different materials and design our flags thinking about which ones will work best. To look at a range of sewing stitches and decide which one will be best suited to our flags • To draw sketches, annotating our designs with the materials we are going to use and the sewing stitch we have chosen. • To create our flags using a simple hand sewing stitch. • To attach our flags to a flagpole, choosing appropriate material to keep the flag sturdy and upright whilst flying. • To display our flags and evaluate them against our design criteria. • To discuss our final designs as a whole class.	**Key learning objectives** • To understand that we use mechanisms to make things easier to move against the pull of gravity. • To learn that a pulley is a wheel with a curved rim which a cord moves around, which acts to change direction of the force and is used to raise heavy weights. • To look at worked examples of pulleys and assess how they allow objects to be moved more easily. • To learn that gears are toothed wheels that lock together to turn one another. • To understand that gears change the direction of movement and different sizes can be used to change the speed. • To understand when gear mechanisms are used in worked examples. • To work in small groups to design a chair lift for a mountain using a pulley mechanism. • To work in small groups to design a gear chain to move a bicycle up a mountain. • To create our designs using our plans to help us.

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		• To evaluate our mechanisms against the design criteria.
Curriculum objectives ***KS1*** **-** *Use the basic principles of a healthy and varied diet to prepare dishes.* *Understand where food comes from.* ***KS2*** *- 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*	**Curriculum objectives** **KS1 -** *Design purposeful, functional, appealing products for themselves and other users based on design criteria.* *Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.* *Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.* *Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.* **KS2 -** Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. *Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.*	**Curriculum objectives** **KS1 -** *Design purposeful, functional, appealing products for themselves and other users based on design criteria.* *Generate, develop, model, and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.* *Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining, and finishing], accurately.* *Explore and evaluate a range of existing products.* *Evaluate their ideas and products against design criteria.* *Explore and use mechanisms [for example, levers, sliders, wheels, and axles], in their products.* **KS2 -** *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.* *Select from and use a wider range of tools and equipment to perform practical tasks [for*

	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.* *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.* *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.*	*example, cutting, shaping, joining, and finishing], accurately.* *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.* *Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers, and linkages].*

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Cycle A

Years 4/5/6		
Autumn 2	**Spring 2**	**Summer 2**
Alarm Call **Electrical systems – buzzers and motors**	**Resistant Buildings** **Frame structures**	**Celebrating Culture and Seasonality** **Cooking and nutrition**
Key learning objectives • To understand that a complete circuit is needed for electricity to flow. • To understand that the circuit must be continuous for the electricity to flow through the components and back to the source. • To know that switches operate as an input device that make a gap in the circuit to stop electricity flowing when they are open. • To know that a circuit usually has at least one output device, such as a buzzer to produce sound or a bulb to produce light. • To use a design sheet and CAFQUES to help with the design brief – customer. aesthetics, function, and ergonomics – to plan an alarm bell using a circuit. • To draw a circuit diagram which includes circuit symbols, an input, and an output. • To create an alarm bell using the circuit diagram and design brief to help with the construction of the circuit. • To test and evaluate the circuit to see if the alarm bell works and if not, what needs adjusting to ensure that it works.	**Key learning objectives** • To design an earthquake-proof building. • To explore what a frame structure is, learning associated key vocabulary. • To learn about earthquakes and how they have led to changes in design work to buildings to make them earthquake-proof. • To look at worked examples of frame structured buildings and think about the materials used to make it strong and sturdy. • To plan and a frame structured building stating what materials are going to be used to stiffen and reinforce the building to make it earthquake-proof. • To use Purple Mash – 2Design and Make – to design the building. • To make the frame structure using appropriate materials and assembling the building using methods to make the building secure and sturdy. • To test the structure's strength and evaluate each other's buildings. • To provide feedback to each other and consider the views of others to make improvements to my work.	**Key learning objectives** • To explore food from different cultures including different cultures within our school. • To conduct a survey to find out different wants and needs within the class with the aim to create a menu. • To collate the results from the survey and analyse the data to find out people's likes, dislikes, dietary requirements, and cultural needs. • To create a main course taking the survey results into consideration. • To research where to source ingredients, discussing how they are grown, reared, caught, and processed. • To discuss and plan what cooking techniques will need to be used to create the dish. • To prepare a main course putting food hygiene and safe kitchen preparation into place. • Serve the main course for the class and taste it, thinking about the ingredients used. • Evaluate the meal and annotate recipe with any amendments/additions that need to be made.

• To use an evaluation sheet to assess the final product against the design brief.		
Curriculum objectives ***KS2 -*** *Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* *Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.* *Select from and use a wider range of materials and components, including construction materials, textiles, and ingredients, according to their functional properties and aesthetic qualities.* *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.* *Understand and use electrical systems in their products [for example, series circuits*	**Curriculum objectives** ***KS2 -*** *Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* *Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.* *Select from and use a wider range of tools and equipment to perform practical tasks [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.* *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.*	**Curriculum objectives** ***KS2 -*** *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.*

incorporating switches, bulbs, buzzers, and motors]. *Apply their understanding of computing to program, monitor and control their products.*	*Understand how key events and individuals in design and technology have helped shape the world.* *Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.*	

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Cycle B

Years 4/5/6		
Autumn 2	**Spring 2**	**Summer 2**
Mechanical Posters - Rivers **Levers and linkages**	**Keep it Safe** **Shell structures**	**Automata Animals** **Mechanical Systems – Cams**
Key learning objectives • To recall what a mechanism is and what they do. • To discuss what kind of mechanisms there is and which they have used previously. • To build on prior knowledge from KS1 and make more complex levers. • To understand that the type of lever used depends on the load, effort, and fulcrum and know what each class these are. • To explore worked examples of objects that use lever mechanisms such as staplers, scissors, and tweezers. • To learn what a linkage mechanism is and that it is used to create a change in direction and motion. • To explore worked examples of objects that use linkage mechanisms such as a table lamp. • To design a mechanical poster about rivers using lever and linkage mechanisms. • To work in small groups to discuss which sections should move and which mechanism will work best. • To select from a range of materials to ensure that the moving section is steady and secure.	**Key learning objectives** • To learn what a shell structure is and look at examples of architectural designs that have used shell structures. • To understand that shell structures are often used for buildings built in areas where there is a risk of earthquakes. • To explore the advantages and disadvantages of designing a building with a shell structure. • To develop a design brief and to sketch ideas of what it will look like. • To discuss in small groups what materials and strengthening techniques will be required to ensure that the object stays protected. • To annotate designs after discussion thinking about the building and assembling process. • To use technology to construct nets to create 3D shapes. • To measure, cut, and shape materials to build the shell structure. Using the 3D shapes to assist with dimensions and measurements. • To test and evaluate final design product by seeing if the object stays protected. • To use an evaluation sheet to assess whether the shell structure was successful and whether	**Key learning objectives** • To learn that a cam mechanism is a rotating or sliding piece in a mechanical linkage used to transform rotary motion into linear motion. • To learn key vocabulary relating to cam mechanisms. • To research ideas to form design ideas for an automated animal using cams mechanisms. • To look at worked examples of cams mechanism and understand how they work. • To understand that a cam mechanism is made up of two parts, a cam, and a follower. • To learn what rotary and linear motion is. • To use a design sheet and CAFQUES to help with the design brief – customer. aesthetics, function, and ergonomics. • To build a framework using a hacksaw and bench hook to cut wood. • To join materials using card triangles or pin nails. • To use sandpaper to ensure a smooth finish. • To select materials to make the cams from. • To accurately measure and cut dowel wood for use as the axle/shaft for the cams to turn on.

• To create a poster using the design. To show the poster to their peers, asking them to identify which mechanisms they have used for each moving part. • To evaluate and receive feedback on their design and creation to make future improvements.	any design plans would need to be altered when making future designs.	• To make a handle to work the mechanical system. • To test and evaluate the final product. • To give and receive peer feedback.
Curriculum objectives ***KS2 -*** *Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* *Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.* *Select from and use a wider range of tools and equipment to perform practical tasks [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.* *Investigate and analyse a range of existing products.*	**Curriculum objectives** ***KS2*** *- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* *Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.* *Select from and use a wider range of tools and equipment to perform practical tasks [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.* *Investigate and analyse a range of existing products.*	**Curriculum objectives** ***KS2 -*** *Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* *Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.* *Select from and use a wider range of tools and equipment to perform practical tasks [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.* *Investigate and analyse a range of existing products.*

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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.* *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].*	*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.* *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].* *Apply their understanding of computing to program, monitor and control their products.*	*Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.* *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].*

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Cycle C

Years 4/5/6		
Autumn 2	**Spring 2**	**Summer 2**
Beach Bags **2D shape to 3D product - Textiles**	**Fairtrade Produce** **Cooking and nutrition**	**Lights** **Electrical systems – circuits and switches**
Key learning objectives • To design and create a beach bag for our geography fieldtrip to the seaside. • To look at examples of back bags and explore different materials used. • To think about how the beach bags are constructed so that they hold items securely. • To research different materials that could be used to create a beach bag. • To sketch a design thinking about size, colours, and functionality. • To understand what cross-sectional and exploded diagrams are and why we use them. • To use computer programmes to create cross-sectional and exploded diagrams to show how to piece the beach bag together. • To create our bags from our 2D design to a 3D design using the cross-sectional and exploded diagrams. • To create a prototype to test the materials before finalising the designs. • To use more complex stitches to create our bags, building on sewing skills from KS1. • To test the bags on the school geography fieldtrip to the seaside.	**Key learning objectives** • To understand what Fairtrade produce is and locate areas that Fairtrade produce comes from. • To explore examples of Fairtrade produce and discuss why it is important to buy Fairtrade food. • To design a selection of items that could be sold at a Fairtrade market in school. • To gather information from other classes to see what food they would purchase, from the selection. • To decide on three items to sell at a Fairtrade market stall based on the data collated. • Design and plan a marketing campaign to advertise the Fairtrade market stall. • To source the Fairtrade items needed and make the three items as a whole class. • To create a questionnaire to get feedback about the items sold from other classes within the school. • Evaluate the questionnaire answers and discuss what could be done differently if holding a Fairtrade market again.	**Key learning objectives** • To learn that Thomas Eddison invented the light bulb and how this changed things significantly. • To investigate light using torches to think about how it works when we switch it on and discuss if the torches use different types of switches. • To understand that light works by connecting electrical circuits. • To learn what a light emitting diode is (LED) and how we can make it work by creating a circuit. • To learn that a circuit contains a battery, resistor, and an LED. • To understand what a circuit diagram is and learn what circuit symbols are. • To design a light that will work when connecting circuits together, thinking about appropriate materials that will let the light shine through. • To draw a circuit diagram including circuit symbols. • To create a circuit using the diagram to light an LED. • To think about any problems that may occur when putting the circuit together and how these problems could be fixed.

• To evaluate and discuss the results on return to school and annotate designs based on relevant feedback.		• To evaluate the circuit based on the circuit diagram. • To discuss as a whole class the process used to create a circuit that makes a light work.
Curriculum objectives ***KS2 -*** *Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* *Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.* *Select from and use a wider range of tools and equipment to perform practical tasks [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.* *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.*	**Curriculum objectives** ***KS2 -*** *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.*	**Curriculum objectives** ***KS2*** *- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.* *Generate, develop, model, and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.* *Select from and use a wider range of tools and equipment to perform practical tasks [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.* *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.*

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Understand how key events and individuals in design and technology have helped shape the world. *Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.* *Apply their understanding of computing to program, monitor and control their products.*		*Understand how key events and individuals in design and technology have helped shape the world.* *Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers, and motors].*