# St. Peter and St. Paul's RC Primary School

**Design Technology- Unit and Progression Overview** 



Holding God's hand, we grow in faith together, we dream, believe, achieve. Following the footsteps of Jesus, we act with love, we care for one another and our world.

## **Design Technology Long Term Plan**

	Nursery						
	Personal, Social and Emotional Development		Physical Development		Understanding the World		Expressive Arts and Design
•	Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.	•	Use large-muscle movements to wave flags and streamers, paint and make marks. Chose the right resources to carry out their own plan. Use one-handed tools and equipment, for example, making snips in paper with scissors.	•	Explore how things work.	•	Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park. Explore different materials freely, in order to develop their ideas about how to use them and what to make. Develop their own ideas and then decide which materials to use to express them. Create closed shapes with continuous lines, and begin to use these shapes to represent objects.
			Rece	pti	ion		
	Physical Development		Expressive Arts and Design		ELG: Fine Motor Skills		ELG: Creating with Materials
•	Progress towards a more fluent style of moving, with developing control and grace. Develop their small motor skills so that they can use a range of tolls competently, safely and confidently. Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.	• • •	Explore, use and refine a variety of artistic effects to express their ideas and feelings. Return to build on their previous learning, refining ideas and developing their ability to represent them. Create collaboratively, sharing ideas, resources and skills.	•	Use a range of small tools, including scissors, paintbrushes and cutlery.	•	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.

Year 1					
Structures: Constructing a windmill Designing, decorating and building a windmill for their mouse client to live in, developing an understanding of different types of windmill, how they work and their key features.	<u>Textiles: puppets</u> Exploring different ways of joining fabrics before creating their own hand puppets based upon characters from a well- known fairy-tale. Children work to develop their technical skills of cutting, gluing, stapling and pinning.	<u>Cooking and Nutrition: Smoothies</u> Handle and explore fruits and vegetables and learn how to identify fruit, before undertaking taste testing to establish chosen ingredients for a smoothie they will make, with accompanying packaging.			
Concepts Design Make Evaluate Structures	<u>Concepts</u> Design Make Evaluate Textiles <u></u>	<u>Concepts</u> Design Make Evaluate Cooking and Nutrition			
<ul> <li>KS1 NATIONAL CURRICULUM</li> <li>When designing and making, pupils should be taught to: <ul> <li>design purposeful, functional, appealing products for themselves and other users based on design criteria</li> <li>generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</li> <li>select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</li> <li>select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</li> <li>explore and evaluate a range of existing products</li> <li>evaluate their ideas and products against design criteria build structures, exploring how they can be made stronger, stiffer and more stable</li> <li>explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</li> </ul> </li> </ul>	<ul> <li>KS1 NATIONAL CURRICULUM</li> <li>When designing and making, pupils should be taught to: <ul> <li>design purposeful, functional, appealing products for themselves and other users based on design criteria</li> <li>generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</li> <li>select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</li> <li>select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</li> <li>evaluate their ideas and products against design criteria</li> </ul> </li> </ul>	<ul> <li>KS1 NATIONAL CURRICULUM</li> <li>When designing and making, pupils should be taught to: <ul> <li>design purposeful, functional, appealing products for themselves and other users based on design criteria</li> <li>generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</li> <li>select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]</li> <li>select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</li> <li>evaluate their ideas and products against design criteria</li> <li>understand where food comes from.</li> </ul> </li> </ul>			

<ul> <li>Know that the sails or blades of a windmill are moved by the wind.</li> </ul>	<ul> <li>Knowledge</li> <li>Know that 'joining technique' means connecting two pieces of material together.</li> </ul>	<ul> <li>Know that a blender is a machine which mixes ingredients together into a smooth liquid.</li> </ul>				
<ul> <li>Know that windmills are used to generate power and were used for grinding flour.</li> <li>Know that a structure is something built for a reason.</li> </ul>	<ul> <li>Know that there are various temporary methods of joining fabric by using staples, glue or pins.</li> <li>Know that different techniques for joining materials can be used for different numbers.</li> </ul>	<ul> <li>Know that a fruit has seeds and a vegetable does not.</li> <li>Know that fruits grow on trees or vines.</li> <li>Know that vegetables can grow either above or below</li> </ul>				
<ul> <li>Know that stable structures do not topple.</li> <li>Know that adding weight to the base of a structure can make it more stable.</li> </ul>	<ul> <li>Know that a template (or fabric pattern) is used to cut out the same shape multiple times.</li> <li>Know that drawing a design idea is useful to see how</li> </ul>	<ul> <li>Know that vegetables are any edible part of a plant.</li> <li>Skills</li> </ul>				
<ul> <li>Skills</li> <li>Finding the middle of an object.</li> <li>Puncturing holes.</li> <li>Adding weight to a structure.</li> <li>Creating supporting structures.</li> <li>Cutting evenly and carefully.</li> <li>Evaluating and improving a product.</li> </ul>	<ul> <li>an idea will look.</li> <li>Skills</li> <li>Using a template to create a design for a puppet.</li> <li>Cutting fabric neatly with scissors.</li> <li>Using joining methods to decorate a puppet.</li> <li>Sequencing steps for construction.</li> <li>Reflecting on a finished product, explaining likes and dislikes</li> </ul>	<ul> <li>Designing smoothie carton packaging by hand.</li> <li>Chopping fruit and vegetables safely to make a smoothie.</li> <li>Juicing fruits to make a smoothie.</li> <li>Identifying if a food is a fruit.</li> <li>Learning where and how fruits and vegetables grow.</li> <li>Tasting and evaluating different foods.</li> <li>Describing appearance, smell and taste.</li> <li>Suggesting information to be included on packaging.</li> </ul>				

Year 2							
<b>Structures: Baby bear's chair</b> Using the tale of Goldilocks and the Three Bears as inspiration, children help Baby Bear by making him a brand new chair. When designing the chair, they consider his needs and what he likes and explore ways of building it so that it is strong.	<u>Mechanisms: Fairground wheel</u> Designing and creating their own Ferris wheels, considering how the different components fit together so that the wheels rotate and the structures stand freely. Pupils select appropriate materials and develop their cutting and joining skills.	<u>Mechanisms: Making a moving monster</u> After learning the terms; pivot, lever and linkage, children design a monster which will move using a linkage mechanism. Children practise making linkages of different types and varying the materials they use to bring their monsters to life.					
<u>Concepts</u> Design Make Evaluate Structures	ConceptsConceptsDesignDesignMakeMakeEvaluateEvaluateMechanismsMechanisms						
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<ul> <li>build structures, exploring how they can be made stronger, stiffer and more stable</li> <li>build structures, exploring how they stiffer and more stable</li> <li>explore and use mechanisms [for ex wheels and axles], in their products</li> </ul>	<ul> <li>explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.</li> </ul>
<ul> <li>Knowledge <ul> <li>To know that shapes and structures with wide, flat bases or legs are the most stable.</li> <li>To understand that the shape of a structure affects its strength.</li> <li>To know that materials can be manipulated to improve strength and stiffness.</li> <li>To know that a structure is something which has been formed or made from parts.</li> <li>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.</li> <li>To know that a 'storog' structure is one which does not break easily.</li> <li>To know that a 'stiff' structure or material is one which does not break easily.</li> <li>To know that a 'stiff' structure or material is one which does not bend easily.</li> </ul> </li> <li>Skills <ul> <li>Generating and communicating ideas using sketching and modelling.</li> <li>Learning about different types of structures, found in the natural world and in everyday objects.</li> <li>Making a structure according to design criteria.</li> <li>Creating joints and structures from paper/card and tape.</li> <li>Building a strong and stiff structure by folding paper.</li> <li>Exploring the features of structures.</li> <li>Identifying the strength of their own structure.</li> <li>Evaluating the strength of their own structure.</li> </ul> </li> </ul>	<ul> <li>knowledge</li> <li>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</li> <li>To know that there is always an input and an output in a mechanism.</li> <li>To know that an input is the energy that is used to start something working.</li> <li>To know that an output is the movement that happens as a result of the input.</li> <li>To know that a linkage mechanism is made up of a series of levers.</li> <li>Skills</li> <li>Creating a design criteria for a moving monster as a class.</li> <li>Designing a moving monster for a specific audience in accordance with a design criteria.</li> <li>Making linkages using card for levers and split pins for pivots.</li> <li>Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.</li> <li>Cutting and assembling components neatly.</li> <li>Evaluating own designs against design criteria.</li> <li>Using peer feedback to modify a final design.</li> </ul>

Year 3							
Cooking and nutrition: Eating seasonally	Digital world: Wearable technology	Structures: Constructing a castle					
Pupils discover when and where fruits and vegetables are	Design, code and promote a piece of wearable technology	Learning about the features of a castle, children design and					
grown and learn about seasonality in the UK. They respond	to use in low light conditions, developing their	make one of their own. Using configurations of handmade					
to a design brief to design a seasonal food tart using	understanding of programming to monitor and control	nets and recycled materials to make towers and turrets and					
ingredients harvested in the UK in May and June.	products to solve a design scenario.	constructing a base to secure them.					
Concepts	Concepts	Concepts					
Design	Design	Design					
Make	Make	Make					
Evaluate	Evaluate	Evaluate					

Cooking and Nutrition	Digital World	Structures	
<ul> <li>KS2 NATTONAL CURRICULUM</li> <li>When designing and making, pupils should be taught to: <ul> <li>generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> <li>select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</li> <li>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</li> <li>understand and apply the principles of a healthy and varied diet</li> <li>prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</li> <li>understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.</li> </ul> </li> </ul>	<ul> <li>KS2 NATIONAL CURRICULUM</li> <li>When designing and making, pupils should be taught to: <ul> <li>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</li> <li>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</li> <li>investigate and analyse a range of existing products</li> <li>evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</li> <li>understand how key events and individuals in design and technology have helped shape the world Technical knowledge</li> <li>apply their understanding of computing to program, monitor and control their products.</li> </ul> </li> </ul>	<ul> <li>KS2 NATTONAL CURRICULUM</li> <li>When designing and making, pupils should be taught to: <ul> <li>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</li> <li>generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> <li>select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</li> <li>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</li> <li>investigate and analyse a range of existing products</li> <li>evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</li> </ul> </li> </ul>	
<ul> <li>Knowledge</li> <li>To know that seasonal means foods that grow in a given season in a given country.</li> <li>Know that ome seasonal foods that grow in the UK and what season they grow in.</li> <li>Know that eating seasonal foods can have a positive impact on the environment.</li> <li>Know how to describe the flavour and texture of foods.</li> <li>Know how to cut and peel safely.</li> <li>Know that the appearance of food is as important as taste.</li> <li>Know that similar coloured fruits and vegetables often have similar nutritional benefits.</li> </ul>	<ul> <li>Knowledge</li> <li>To understand that, in programming, a 'loop' is code that repeats something again and again until stopped.</li> <li>To know that a micro:bit is a pocket-sized, codeable computer.</li> <li>To know that a simulator is able to replicate the functions of an existing piece of technology.</li> <li>To know what the 'Digital revolution' is and features of some of the products that have evolved as a result.</li> <li>To understand what is meant by 'point of sale display.'</li> <li>To know that CAD stands for 'Computer-aided design'.</li> <li>To know what a focus group is by taking part in one.</li> </ul>	<ul> <li>Knowledge</li> <li>To understand that wide and flat based objects are more stable.</li> <li>To understand the importance of strength and stiffness in structures.</li> <li>To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose.</li> <li>To know that a façade is the front of a structure.</li> <li>To understand that a castle needed to be strong and stable to withstand enemy attack.</li> </ul>	
<ul> <li>Skills</li> <li>Describing how climate affects where foods grow.</li> <li>Identifying seasonal ingredients from the UK.</li> <li>Tasting seasonal ingredients.</li> <li>Describing the texture and flavour of ingredients.</li> <li>Peeling foods by hand or with a peeler. Cutting ingredients safely.</li> <li>Choosing ingredients based on a design brief.</li> </ul>	<ul> <li>Skills</li> <li>Problem solving by suggesting potential features on a micro:bit and justifying my ideas.</li> <li>Drawing and manipulating 2D shapes, using computeraided design, to produce a point of sale badge.</li> <li>Developing design ideas through annotated sketches to create a product concept.</li> <li>Developing design criteria to respond to a design brief.</li> <li>Following a list of design requirements.</li> </ul>	<ul> <li>Skills</li> <li>Designing a castle with key features to appeal to a specific person/purpose.</li> <li>Drawing and labelling a castle design using 2D shapes.</li> <li>Designing and/or decorating a castle tower on CAD software.</li> <li>Constructing a range of 3D geometric shapes using nets.</li> </ul>	

<ul> <li>Following the instructions within a recipe.</li> <li>Describing the benefits of seasonal fruits and vegetables and their impact on the environment.</li> </ul>	<ul> <li>Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.</li> <li>Analysing and evaluating an existing product.</li> <li>Using feedback from peers to improve a design.</li> </ul>	<ul> <li>Creating special features for individual designs.</li> <li>Making facades from a range of recycled materials.</li> <li>Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design.</li> <li>Suggesting points for modification of the individual designs.</li> </ul>
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Year 4.					
Structures: Pavilions Exploring pavilion structures, children learn about what they are used for and investigate how to create strong and stable structures before designing and creating their own pavilions, complete with cladding.	<u>Mechanical systems: Making a slingshot car</u> Transforming lollipop sticks, wheels, dowels and straws into a moving car. Using a glue gun to, making a launch mechanism, designing and making the body of the vehicle using nets and assembling these to the chassis.	<b>Electrical systems: Torches</b> Applying their scientific understanding of electrical circuits, children create a torch, designing and evaluating their product against set design criteria.			
Concepts Design Make Evaluate Structures	Concepts Design Make Evaluate Mechanical systems	<u>Concepts</u> Design Make Evaluate Electrical systems			
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	<ul> <li>understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]</li> </ul>	<ul> <li>understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]</li> </ul>
<ul> <li>Knowledge</li> <li>To understand what a frame structure is.</li> <li>To know that a 'free-standing' structure is one that can stand on its own.</li> <li>To know that a pavilion is a decorative building or structure for leisure activities.</li> </ul>	<ul> <li>Knowledge</li> <li>To understand that all moving things have kinetic energy.</li> <li>To understand that kinetic energy is the energy that something (object/person) has by being in motion.</li> </ul>	<ul> <li>Knowledge</li> <li>To understand that electrical conductors are materials which electricity can pass through.</li> <li>To understand that electrical insulators are materials which electricity cannot pass through.</li> <li>To know that a battery contains stored electricity</li> </ul>
<ul> <li>To know that cladding can be applied to structures for different effects.</li> <li>To know that aesthetics are how a product looks.</li> </ul> Skills	<ul> <li>To know that air resistance is the level of drag on an object as it is forced through the air.</li> <li>To understand that the shape of a moving object will affect how it moves due to air resistance.</li> </ul> Skills	<ul> <li>that can be used to power products.</li> <li>To know that an electrical circuit must be complete for electricity to flow.</li> <li>To know that a switch can be used to complete and break an electrical circuit.</li> </ul>
<ul> <li>Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.</li> <li>Building frame structures designed to support weight.</li> <li>Creating a range of different shaped frame structures.</li> <li>Making a variety of free-standing frame structures of different shapes and sizes.</li> <li>Selecting appropriate materials to build a strong structure and for the cladding.</li> <li>Reinforcing corners to strengthen a structure.</li> <li>Creating a design in accordance with a plan.</li> <li>Learning to create different textural effects with materials.</li> </ul>	<ul> <li>Designing a shape that reduces air resistance.</li> <li>Drawing a net to create a structure from.</li> <li>Choosing shapes that increase or decrease speed as a result of air resistance.</li> <li>Personalising a design.</li> <li>Measuring, marking, cutting and assembling with increasing accuracy.</li> <li>Making a model based on a chosen design.</li> <li>Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</li> </ul>	<ul> <li>Skills</li> <li>Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.</li> <li>Making a torch with a working electrical circuit and switch.</li> <li>Using appropriate equipment to cut and attach materials.</li> <li>Assembling a torch according to the design and success criteria.</li> <li>Evaluating electrical products.</li> <li>Testing and evaluating the success of a final product.</li> </ul>

Year 5						
Electrical systems: Doodlers Explore series circuits further and introduce motors. Explore how the design cycle can be approached at a different starting point, by investigating an existing product, which uses a motor, to encourage pupils to problem-solve and work out how the product has been constructed, ready to	<u>Mechanical systems: Making a pop-up book</u> Creating a four-page pop-up storybook design incorporating a range of mechanisms and decorative features, including: structures, levers, sliders, layers and spacers.	<u>Cooking and nutrition: Developing a recipe</u> Research and modify a traditional bolognese sauce recipe to improve the nutritional value. Cook improved version and create packaging that fits design criteria. Learn about where beef comes from.				
develop their own.						

Concepts	Concepts	<u>Concepts</u>
Design	Design	Design
Make	Make	Make
Evaluate	Evaluate	Evaluate
Electrical systems	Mechanical systems	Cooking and Nutrition
KS2 NATIONAL CURRICULUM	KS2 NATIONAL CURRICULUM	KS2 NATIONAL CURRICULUM
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Knowledge	<u>Knowledge</u>	<u>Knowledge</u>
<ul> <li>To know that, in a series circuit, electricity only flows in one direction.</li> <li>To know when there is a break in a series circuit, all components turn off.</li> <li>To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.</li> <li>To know a motorised product is one which uses a motor to function.</li> </ul>	<ul> <li>To know that mechanisms control movement.</li> <li>To understand that mechanisms can be used to change one kind of motion into another.</li> <li>To understand how to use sliders, pivots and folds to create paper-based mechanisms.</li> <li>To know that a design brief is a description of what I am going to design and make.</li> <li>To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</li> </ul>	<ul> <li>That beef comes from cows reared on farms.</li> <li>That recipes can be adapted to suit nutritional needs and dietary requirements.</li> <li>That nutritional information is found on food packaging.</li> <li>That coloured chopping boards can prevent cross-contamination.</li> <li>That food packaging serves many purposes.</li> </ul>

#### <u>Skills</u>

- Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.
- Developing design criteria based on findings from investigating existing products.
- Developing design criteria that clarifies the target user.
- Altering a product's form and function by tinkering with its configuration.
- Making a functional series circuit, incorporating a motor.
- Constructing a product with consideration for the design criteria.
- Breaking down the construction process into steps so that others can make the product.
- Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.
- Determining which parts of a product affect its function and which parts affect its form.
- Analysing whether changes in configuration positively or negatively affect an existing product.
- Peer evaluating a set of instructions to build a product.

### <u>Skills</u>

- Designing a pop-up book which uses a mixture of structures and mechanisms.
- Naming each mechanism, input and output accurately.
- Storyboarding ideas for a book.
- Following a design brief to make a pop up book, neatly and with focus on accuracy.
- Making mechanisms and/or structures using sliders, pivots and folds to produce movement.
- Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.
- Evaluating the work of others and receiving feedback on own work.
- Suggesting points for improvement.

#### <u>Skills</u>

- Explaining the farm-to-fork process.
- Researching existing recipes.
- Suggesting alternative ingredients.
- Analysing nutritional content.
- Writing an alternative recipe.
- Understanding cross-contamination.
- Using preparation skills.
- Designing a jar label.
- Making a developed recipe.

Year 6					
<b>Textiles: Waistcoats</b> Selecting suitable fabrics, using templates, pinning, decorating and stitching to create a waistcoat for a person or purpose of their choice.	<b>Structures: Playgrounds</b> Designing and creating a model of a new playground featuring five apparatus, made from three different structures. Creating a footprint as the base, pupils visualise objects in plan view and get creative with their use of natural features.	Digital world: Navigating the world Programming a navigation tool to produce a multifunctional device for trekkers. Combining 3D objects to form a complete product in CAD 3D modelling software and presenting a pitch to 'sell' their product.			
<u>Concepts</u>	Concepts	<u>Concepts</u>			
Design	Design	Design			
Make	Make	Make			
Evaluate	Evaluate	Evaluate			
Textiles	Structures	Digital World			
KS2 NATIONAL CURRICULUM	KS2 NATIONAL CURRICULUM	KS2 NATIONAL CURRICULUM			
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Knowledge	Knowledge	Knowledge
<ul> <li>To understand that it is important to design clothing with the client/target customer in mind.</li> <li>To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.</li> <li>To understand the importance of consistently sized stitches.</li> <li>Skills <ul> <li>Designing a waistcoat in accordance with a specification and design criteria to fit a specific theme.</li> <li>Annotating designs.</li> <li>Using a template when pinning panels onto fabric.</li> <li>Marking and cutting fabric accurately, in accordance with a design.</li> <li>Sewing a strong running stitch, making small, neat stitches and following the edge.</li> <li>Tying strong knots.</li> <li>Decorating a waistcoat – attaching objects using thread and adding a secure fastening.</li> <li>Learning different decorative stitches.</li> </ul> </li> </ul>	<ul> <li>To know that structures can be strengthened by manipulating materials and shapes.</li> <li>To understand what a 'footprint plan' is.</li> <li>To understand that in the real world, design can impact users in positive and negative ways.</li> <li>To know that a prototype is a cheap model to test a design idea.</li> <li>Skills</li> <li>Designing a playground featuring a variety of different structures, giving consideration to how the structures will be used.</li> <li>Considering effective and ineffective designs.</li> <li>Building a range of play apparatus structures drawing upon new and prior knowledge of structures.</li> <li>Measuring, marking and cutting wood to create a range of structures.</li> <li>Improving a design plan based on peer evaluation.</li> <li>Testing and adapting a design to improve it as it</li> </ul>	<ul> <li>To know that accelerometers can detect movement.</li> <li>To understand that sensors can be useful in products as they mean the product can function without human input.</li> <li>To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request.</li> <li>To know that 'multifunctional' means an object or product has more than one function.</li> <li>To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.</li> <li>Skills</li> <li>Writing a design brief from information submitted by a client.</li> <li>Developing design criteria to fulfil the client's request.</li> <li>Developing a product idea through annotated sketches.</li> <li>Placing and manoeuvring 3D objects, using CAD.</li> <li>Changing the properties of, or combine one or more 3D objects, using CAD.</li> </ul>

	•	Explaining material choices and why they were
		chosen as part of a product concept. Programming
		an N,E, S,W cardinal compass. Explaining how my
		program fits the design criteria and how it would be
		useful as part of a navigation tool. Developing an
		awareness of sustainable design. Explaining the key
		functions and features of my navigation tool to the
		client as part of a product concept pitch.
		Demonstrating a functional program as part of a
		product concept.