Design and Technology Year 4

Autumn 2 - Fresh Food, Good Food	
Previous learning	
This project teaches children about food decay and preservation. They discover key inventions in food preservation and packaging, then make examples. The children prepare, package and evaluate a healthy snack.	
Substantive Knowledge	**Disciplinary knowledge**
Children from Patrington Primary Academy will be able to participate fully in an increasingly technological world and have an understanding of how to be critical and reflective consumers. They will be able to use their practical, creative and reflective skills to become consumers and innovators who are well informed and can use their own skills to develop products for the future.	By the end of Key Stage Two, children at Patrington Primary Academy will be able to: prepare ingredients safely and hygienically and cook nutritious food. They will be able to design their own products using a range of materials and evaluate their product against success criteria. The children will generate their own product ideas by reflecting upon existing products and then developing prototypes. Finally, in order to make successful products, the children will have a secure understanding of mechanical structures, such as: gears, pulley systems and levers.

Lesson 1	**Technical Knowledge**
	• Can investigate and identify features of a familiar product. • Know that particular areas of the world have conditions suited to growing certain crops, such as coffee in Peru and citrus fruits in California in the United States of America. • Can identify and name foods that are produced in different places in the UK and beyond.
Lesson 2	**Design**
	• Cooking techniques include baking, boiling, frying, grilling and roasting. • Identify and use a range of cooking techniques to prepare a simple meal or snack. • Healthy snacks include fresh or dried fruit and vegetables, nuts and seeds, rice cakes with low-fat cream cheese, homemade popcorn or chopped vegetables with hummus. A healthy packed lunch might include a brown or wholemeal bread sandwich containing eggs, meat, fish or cheese, a piece of fresh fruit, a low-sugar yoghurt, rice cake or popcorn and a drink, such as water or semi-skimmed milk • Design a healthy snack or packed lunch and explain why it is healthy.
Lesson 3	**Make**
	• Can use cooking techniques include baking, boiling, frying, grilling and roasting. • Can identify and use a range of cooking techniques to prepare a simple meal or snack.
Lesson 4	**Evaluate**
	• Know evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made. Evaluation also includes suggesting improvements and explaining why they should be made. • Can identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements.

Vocabulary	Sticky Knowledge
• Cooking techniques, baking, boiling, frying, grilling, roasting, wholemeal.	• Know that particular areas of the world have conditions suited to growing certain crops, such as coffee in Peru and citrus fruits in California in the United States of America. • Can identify and name foods that are produced in

	different places in the UK. The specific examples will depend on what ingredients you are using. E.g British grown strawberries etc..

Spring 2 - Misty Mountain, Winding River - Functional and Fancy Fabrics - Textiles	
Previous learning	
This project teaches children about home furnishings and the significant designer William Morris. They learn techniques for decorating fabric, including block printing, hemming and embroidery and use them to design and make a fabric sample.	
Substantive Knowledge	**Disciplinary knowledge**
Children from Patrington Primary Academy will be able to participate fully in an increasingly technological world and have an understanding of how to be critical and reflective consumers. They will be able to use their practical, creative and reflective skills to become consumers and innovators who are well informed and can use their own skills to develop products for the future.	By the end of Key Stage Two, children at Patrington Primary Academy will be able to: prepare ingredients safely and hygienically and cook nutritious food. They will be able to design their own products using a range of materials and evaluate their product against success criteria. The children will generate their own product ideas by reflecting upon existing products and then developing prototypes. Finally, in order to make successful products, the children will have a secure understanding of mechanical structures, such as: gears, pulley systems and levers.

Lesson 1	**Technical Knowledge**
	● Know that different materials and components have a range of properties, making them suitable for different tasks. It is important to select the correct material or component for the specific purpose, depending on the design criteria. ● Know that design features are the aspects of a product's design that the designer would like to emphasise, such as the use of a particular material or feature that makes the product easier to use or more durable. ● Know that a hem runs along the edge of a piece of cloth or clothing. It is made by turning under a raw edge and sewing to give a neat and quality finish.
Lesson 2	**Design**
	● Can choose from a range of materials, showing an understanding of their different characteristics. ● Using a simple computer program to plan and design their creation.
Lesson 3	**Make**
	● Block printing techniques and fabric paint are used to create decorative, repeated patterns on fabrics. ● Hand sew a hem or seam using a running stitch. ● Create detailed decorative patterns on fabric using printing techniques.
Lesson 4	**Evaluate**
	● Know evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made. Evaluation also includes suggesting improvements and explaining why they should be made. ● Can identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements

Vocabulary	**Sticky Knowledge**
● Fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance, running stitch, decorative.	● A hem runs along the edge of a piece of cloth or clothing ● A running stitch consists of a line of small, even stitches which run back and forth through the cloth

	without overlapping. ● The 'raw edge' is the cut edge of the fabric

Summer 1 - Tomb builders - Mechanisms	
Previous learning	
This project teaches children about simple machines, including wheels, axles, inclined planes, pulleys and levers, exploring how they helped ancient builders to lift and move heavy loads.	
Substantive Knowledge	**Disciplinary knowledge**
Children from Patrington Primary Academy will be able to participate fully in an increasingly technological world and have an understanding of how to be critical and reflective consumers. They will be able to use their practical, creative and reflective skills to become consumers and innovators who are well informed and can use their own skills to develop products for the future.	By the end of Key Stage Two, children at Patrington Primary Academy will be able to: prepare ingredients safely and hygienically and cook nutritious food. They will be able to design their own products using a range of materials and evaluate their product against success criteria. The children will generate their own product ideas by reflecting upon existing products and then developing prototypes. Finally, in order to make successful products, the children will have a secure understanding of mechanical structures, such as: gears, pulley systems and levers.
Lesson 1	**Technical Knowledge**
	● To know that mechanisms can be used to add functionality to a model. For example, sliders or levers can be used in moving pictures, storybooks or simple puppets; linkages in moving vehicles or puppets; gears in motorised vehicles or spinning toys; pulleys in cable cars or transport systems and cams in 3-D moving toys or pictures. ● Understand that useful tools for cutting (including scissors, craft knives, junior hacksaws with pistol grip, bench hooks and glue guns. ● Understand that tools should only be used with adult supervision and safety rules must be followed. ● Be able to select, name and use tools with adult supervision.
Lesson 2	**Technical Knowledge**
	● To understand that a prototype is a mockup of a design that will look like the finished product but may not be full size or made of the same materials. ● To understand that shell and frame structures can be strengthened by glueing several layers of card together, using triangle shapes, adding diagonal support struts and using jinks corners.
Lesson 3	**Design**
	● To plan their desired design using a simple software and mood board. ● To use design to create a prototype shell and frame structures, showing an awareness of how to strengthen, stiffen and reinforce their shell to create a more successful design during the make stage.
Lesson 4	**Make**
	● Are able to explore and use a range of mechanisms (levers, axles, cams, gears and pulleys) in models or products.
Lesson 5	**Evaluate**
	● Know evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making

	process and why the changes were made. Evaluation also includes suggesting improvements and explaining why they should be made. ● Can identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements

Vocabulary	Sticky Knowledge
● mechanism, lever, linkage, pivot, prototype, axels, cams, gears, software	● Mechanical systems have at least three elements: input, process and output. ● A prototype is the shell or frame of the designed structure.

Summer 2 - Electricity	
Previous learning	
This project teaches children about simple machines, including wheels, axles, inclined planes, pulleys and levers, exploring how they helped ancient builders to lift and move heavy loads.	
Substantive Knowledge	**Disciplinary knowledge**
Children from Patrington Primary Academy will be able to participate fully in an increasingly technological world and have an understanding of how to be critical and reflective consumers. They will be able to use their practical, creative and reflective skills to become consumers and innovators who are well informed and can use their own skills to develop products for the future.	By the end of Key Stage Two, children at Patrington Primary Academy will be able to: prepare ingredients safely and hygienically and cook nutritious food. They will be able to design their own products using a range of materials and evaluate their product against success criteria. The children will generate their own product ideas by reflecting upon existing products and then developing prototypes. Finally, in order to make successful products, the children will have a secure understanding of mechanical structures, such as: gears, pulley systems and levers.

Lesson 1	**Technical Knowledge**
	● Know that a remote control is controlling a machine or activity from a distance. Computers can be used to remotely control a device, such as a light, speaker or buzzer. ● To understand that components can be added to circuits to achieve a particular goal. These include bulbs, buzzers, motors and switches.
Lesson 2	**Design**
	● To create annotated sketches and exploded diagrams that show specific parts of the design, highlight sections or show functions. They communicate ideas in a visual, detailed way.
Lesson 3	**Design/Test**
	● To be able to use their annotated sketches and exploded designs to test and communicate their ideas. ● To use this time to reflect and incorporate a variety of components into circuit design.
Lesson 4	**Make**
	● To write a program to control a physical device, such as a light, speaker or buzzer. ● To incorporate fruits that use a variety of components into models or products.
Lesson 5	**Evaluate**
	● Know evaluation can be done by considering whether the product does what it was designed to do, whether it has an attractive appearance, what changes were made during the making process and why the changes were made. Evaluation also includes suggesting improvements and explaining why they should be made. ● Can identify what has worked well and what aspects of their products could be improved, acting on their own suggestions and those of others when making improvements

Lesson 6	Post Evaluation
	● After reflection on their designs, plan to incorporate a remote control. This remote control is to control a machine from a distance. Computers can be used to remotely control a device such as a buzzer, light or speaker. Write a program to control one of these devices to be used within their or a class electrical circuit.

Vocabulary	Sticky Knowledge
● 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	● A remote control controls a machine from a distance. ● An electrical circuit is a complete path around which electricity can flow. It must include a source of electricity, such as a battery.