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Intent

The Design and technology scheme of work aims to inspire pupils to be innovative and creative thinkers who have an appreciation for the product design cycle through ideation, creation, and evaluation. We want pupils to develop the confidence to take risks, through drafting design concepts, modelling, and testing and to be reflective learners who evaluate their work and the work of others. Through our scheme of work, we aim to build an awareness of the impact of design and technology on our lives and encourage pupils to become resourceful, enterprising citizens who will have the skills to contribute to future design advancements. Our Design and technology scheme of work enables pupils to meet the end of key stage attainment targets in the National curriculum and the aims also align with those in the National curriculum. EYFS (Reception) units provide opportunities for pupils' to work towards the Development matters statements and the Early Learning Goals.

Implementation

The Design and technology National curriculum outlines the three main stages of the design process: design, make and evaluate. Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical, and technical understanding required for each strand. Cooking and nutrition* has a separate section, with a focus on specific principles, skills and techniques in food, including where food comes from, diet and seasonality. Each of our key areas follows the design process (design, make and evaluate) and has a particular theme and focus from the technical knowledge or cooking and nutrition section of the curriculum. The Kapow Primary scheme is a spiral curriculum, with key areas revisited again and again with increasing complexity, allowing pupils to revisit and build on their previous learning. Lessons incorporate a range of teaching strategies from independent tasks, paired and group work including practical hands-on, computer-based and inventive tasks. This variety means that lessons are engaging and appeal to those with a variety of learning styles. Differentiated guidance is available for every lesson to ensure that lessons can be accessed by all pupils and opportunities to stretch pupils' learning are available when required. Knowledge organisers for each unit support pupils in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary.

Impact

Children will:

- Understand the functional and aesthetic properties of a range of materials and resources.
- Understand how to use and combine tools to carry out different processes for shaping, decorating, and manufacturing products.
- Build and apply a repertoire of skills, knowledge and understanding to produce high quality, innovative outcomes, including models, prototypes, CAD, and products to fulfil the needs of users, clients, and scenarios.
- Understand and apply the principles of healthy eating, diets, and recipes, including key processes, food groups and cooking equipment. → Have an appreciation for key individuals, inventions, and events in history and of today that impact our world.
- Recognise where our decisions can impact the wider world in terms of community, social and environmental issues.
- Self-evaluate and reflect on learning at different stages and identify areas to improve.
- Meet the end of key stage expectations outlined in the National curriculum for Design and technology.
- Meet the end of key stage expectations outlined in the National curriculum for Computing.

The National Curriculum for (Insert Subject) across Key Stages

Key stage 1

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.

Key stage 2

Pupils should be taught to:

Design

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

Make

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

Evaluate

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

Technical knowledge.

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

Subject strands

Cooking and Nutrition

Mechanisms/Mechanical Systems

Structures Textiles

Electrical Systems

Digital World

Curriculum topics by term.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6	Stand Alone Lessons
EYFS	Structures: Junk Modelling		Textiles: Book marks		Structures: Boats		Seasonal projects
Seasonal Projects (EYFS)	Hibernation Box	Sliding Picture	Flower threading	Hanging decoration	Designing a rainbow salad Making a rainbow salad		
Year 1	Structures: Constructing a Windmill		Textiles: Puppets		Cooking and Nutrition: Smoothies		Mechanisms: Making a moving story book
Year 2		Structures: Baby Bear's Chair		Mechanisms: Fairground wheel		Mechanisms: Making a moving monster	Cooking and nutrition: A balanced diet (Term 6)
Year 3	Cooking and nutrition: Eating seasonally		Digital world Wearable technology		Structures: Constructing a castle		Textiles: Cross-stitch and applique Mechanical systems: Pneumatic toys
Year 4		Textiles: Fastenings		Electrical systems: Torches		Mechanical systems: Making a slingshot car	Cooking and nutrition: Adapting a recipe

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Year 5	Electrical systems: Doodlers		Mechanical systems: Making a pop-up book		Developing a recipe		
Year 6		Textiles: Tudor Money pouches		Structures: Playgrounds		Digital World: Navigating the World	

		TERM 1	TERM 2	TERM 3	TERM 4	TERM 5	TERM 6
F1	Topic	Structures: Junk Modelling		Textiles: Book marks		Structures: Boats	
	‘I Know’ The knowledge to be learnt	<ul style="list-style-type: none"> • To know there are a range to different materials that can be used to make a model and that they are all slightly different. • Making simple suggestions to fix their junk model. 		To know that a design is a way of planning our idea before we start. • To know that threading is putting one material through an object.		<ul style="list-style-type: none"> • To know that ‘waterproof’ materials are those which do not absorb water. • To know that some objects float and others sink. • To know the different parts of a boat 	
	Key Vocabulary	Join • Stick • Cut • Bend • Slot • Scissors • Measure • Materials • Fix		Waterproof • Absorb • Prediction • Variable • Experiment • Investigation • Float • Sink • Junk		Thread • Weave • Pattern • Sew • Sewing needle • Embroider • Design • Evaluate	
	‘I can’ The skills to be developed	<ul style="list-style-type: none"> • Making verbal plans and material choices. • Developing a junk model. Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together. Giving a verbal evaluation of their own and others’ junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model. 		<ul style="list-style-type: none"> • Discussing what a good design needs. • Designing a simple pattern with paper. • Designing a bookmark. • Choosing from available materials. Developing fine motor/cutting skills with scissors. • Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. • Using a prepared needle and wool to practise threading. • Reflecting on a finished product and comparing to their design. 		<ul style="list-style-type: none"> • Designing a junk model boat. • Using knowledge from exploration to inform design. • Making a boat that floats and is waterproof, considering material choices. • Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it moves. 	

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		TERM 1	TERM 2	TERM 3	TERM 4	TERM 5	TERM 6
Year 1	Topic	Structures: Constructing a Windmill		Textiles: Puppets		Cooking and Nutrition: Smoothies	
	'I Know' The knowledge to be learnt	To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). • To understand that axles are used in structures and mechanisms to make parts turn in a circle. • To begin to understand that different structures are used for different purposes. • To know that a structure is something that has been made and put together. • To know that the sails or blades of a windmill are moved by the wind. • To know that a structure is something built for a reason. • To know that stable structures do not topple. • To know that adding weight to the base of a structure can make it more stable. • To know that design criteria is a list of points to ensure the product meets the clients needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure. • To know that windmills are used to generate power and were used for grinding flour		• To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples, glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look.		• To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables is any edible part of a plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).	
	Key Vocabulary	• Axle • Base • Centre • Design • Evaluation • Equal • Evaluate • Middle • Rotate • Rotor • Rotor Blades • Sails • Same • Stable • Strong • Structure • Test • Weak • Wind • Windmill		Decorate • Design • Fabric • Glue • Model • Hand puppet • Safety pin • Staple • Stencil • Template		Blender • Fruit • Healthy • Ingredients • Recipe • Smoothie • Vegetable • Seed • Root • Leaf • Stem • Flavour • Design • Cut • Juice • Table knife • Juicer • Plant • Bush • Tree • Vine • Chopping board • Fork • Taste • Select • Blend • Evaluate • Compare	
	'I can' The skills to be developed	• Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design. • Making stable structures from card. • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure. • Finding the middle of an object. • Puncturing holes. • Adding weight to		Using a template to create a design for a puppet. • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction. • Reflecting on a finished product, explaining likes and dislikes.		• Chopping fruit and vegetables safely to make a smoothie. • Juicing fruits safely to make a smoothie. • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. • Comparing their own smoothie with someone else's.	

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		structures. • Creating supporting structures. • Cutting evenly and carefully. • Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't. • Suggest points for improvements.				
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		TERM 1	TERM 2	TERM 3	TERM 4	TERM 5	TERM 6
Year 2	Topic	Structures: Baby Bear's Chair		Mechanisms: Fairground wheel		Mechanisms: Making a moving monster	
	'I Know' The knowledge to be learnt	<ul style="list-style-type: none"> • To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily. • To know that natural structures are those found in nature. • To know that man-made structures are those made by people. 		<ul style="list-style-type: none"> • To know that different materials have different properties and are therefore suitable for different uses. • To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur. 		<ul style="list-style-type: none"> • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers. • To know some real-life objects that contain mechanisms. 	
	Key Vocabulary	Function • Man-made • Mould • Natural • Stable • Stiff • Strong • Structure • Test • Weak		Axle • Decorate • Evaluation • Ferris wheel • Mechanism • Stable • Strong • Test • Waterproof • Weak		Evaluation • Input • Lever • Linear motion • Linkage • Mechanical • Mechanism • Motion • Oscillating motion • Output • Pivot • Reciprocating motion • Rotary motion • Survey	
	'I can' The skills to be developed	<ul style="list-style-type: none"> • Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects. • Making a structure according to design criteria. • Creating joints and structures from paper/card and tape. • Building a strong and stiff structure by folding paper. • Exploring the features of structures. • Comparing the stability of different shapes. • Testing the strength of own structures. • Identifying the weakest part of a structure. 		<ul style="list-style-type: none"> • Selecting a suitable linkage system to produce the desired motion. • Designing a wheel. • Selecting materials according to their characteristics. • Following a design brief. • Evaluating different designs. • Testing and adapting a design. 		<ul style="list-style-type: none"> • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria. • Making linkages using card for levers and split pins for pivots. • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. • Cutting and assembling components neatly. • Evaluating own designs against design criteria. • Using peer feedback to modify a final design. 	

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		Evaluating the strength, stiffness and stability of own structure.					
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		TERM 1	TERM 2	TERM 3	TERM 4	TERM 5	TERM 6
	Topic	Cooking and nutrition: Eating seasonally		Digital world Wearable technology		Structures: Constructing a castle	
Year 3	'I Know' The knowledge to be learnt	<ul style="list-style-type: none"> To know that not all fruits and vegetables can be grown in the UK. To know that climate affects food growth. To know that vegetables and fruit grow in certain seasons. To know that cooking instructions are known as a 'recipe'. To know that imported food is food which has been brought into the country. To know that exported food is food which has been sent to another country.. To know that eating seasonal foods can have a positive impact on the environment. To know that similar coloured fruits and vegetables often have similar nutritional benefits. To know that the appearance of food is as important as taste. 		<ul style="list-style-type: none"> To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. To know that a Micro:bit is a pocket-sized, codeable computer. To know that a simulator is able to replicate the functions of an existing piece of technology. To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. To understand what is meant by 'point of sale display.' To know that CAD stands for 'Computer-aided design'. To know what a focus group is by taking part in one. 		<ul style="list-style-type: none"> To understand that wide and flat based objects are more stable. To understand the importance of strength and stiffness in structures. To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. To know that a façade is the front of a structure. To understand that a castle needed to be strong and stable to withstand enemy attack. To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. To know that a design specification is a list of success criteria for a product. 	
	Key Vocabulary	<ul style="list-style-type: none"> Arid Climate Complementary Country Export Import Mediterranean Mock-up Mountain Peel Polar Seasonal Seasons Snip Temperate Texture Tropical Weather 		<ul style="list-style-type: none"> Analogue Analyse Annotate Badge CAD Control Design criteria Develop Digital Digital revolution Digital world Display Electronic Fastening Feature Feedback Form Function Initiate Layers Loops Micro:bit Monitor Net Point of sale Product Product concept Program Sense Simulator Smart Technology Test User 		<ul style="list-style-type: none"> 2D shapes 3D shapes Castle Design criteria Evaluate Facade Feature Flag Net Recyclable Scoring Stable Strong Structure Tab Weak 	
	'I can' The skills to be developed	<ul style="list-style-type: none"> Designing a recipe for a savoury tart. Following the instructions within a recipe. Tasting seasonal ingredients. Selecting seasonal ingredients. Peeling ingredients safely. Cutting safely with a vegetable knife. Establishing and using design criteria to help 		<ul style="list-style-type: none"> Problem solving by suggesting which features on a Micro:bit might be useful and justifying my ideas. Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge. Developing design ideas through annotated sketches to create a product concept. 		<ul style="list-style-type: none"> Designing a castle with key features to appeal to a specific person/purpose. Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. Designing and/or decorating a 	

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		test and review dishes. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement when making a seasonal tart.		Developing design criteria to respond to a design brief. • Following a list of design requirements. • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. • Analysing and evaluating wearable technology. • Using feedback from peers to improve design.		castle tower on CAD software. • Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials. • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • Suggesting points for modification of the individual designs.	
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		TERM 1	TERM 2	TERM 3	TERM 4	TERM 5	TERM 6	Standalone lesson
Year 4	Topic		Textiles Fastenings		Electrical systems: Torches		Mechanical systems: Making a slingshot car	Cooking and nutrition: Adapting a recipe
	'I Know' The knowledge to be learnt		<ul style="list-style-type: none"> To know the advantages and disadvantages of different types of fastening. To know that a product must be designed to a design criteria. To know a fastening is something that holds two pieces of material together. To know that different fastening types are useful for different purposes. To know that a product design must be tested by making a template To know that creating a mock-up (prototype) of a design is useful for checking ideas and proportions. 		<ul style="list-style-type: none"> To understand that electrical conductors are materials which electricity can pass through. To understand that electrical insulators are materials which electricity cannot pass through. To know that a battery contains stored electricity that can be used to power products. To know that an electrical circuit must be complete for electricity to flow. To know that a switch can be used to complete and break an electrical circuit. To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. 		<ul style="list-style-type: none"> To understand that all moving things have kinetic energy. To understand that kinetic energy is the energy that something (object/person) has by being in motion. To know that air resistance is the level of drag on an object as it is forced through the air. To understand that the shape of a moving object will affect how it moves due to air resistance. To understand that products change and evolve over time. To know that aesthetics means how an object or product looks in design and technology. To know that a template is a stencil you can use to help you draw the same shape accurately. To know that a birds-eye view means a view from a high angle (as if a bird in flight). To know that graphics are images which are designed to explain or advertise something. To know that it is important to assess and evaluate design ideas and models against a list of design criteria. 	<ul style="list-style-type: none"> To know the amount of an ingredient recipe is known as the 'quantity' Safety and hygiene are important when cooking To know cooking techniques of sieving, measuring, mixing, stirring, cutting out and shaping. To understand the importance of budgeting while planning ingredients for a recipe. That products often have a target audience.

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	Key Vocabulary		Fastening, fabric, fix, button, press stud, velcro, zip, zipper, needle, thread, eye of the needle, sew, sewing, stitch, design, template, assemble		Battery, bulb, buzzer, cell, component, conductor, copper, design criteria, electrical item, electricity, electronic item, function, insulator, series circuit, switch, test, torch, wire		Aesthetic, air resistance, chassis, design, design criteria, function, graphics, kinetic energy, mechanism, net, structure	Adapt, addition, appearance, budget, butterfly, combine, comment, compare, construct, cream, crunchy, cuboid, cut, design, evaluate, fold, hygiene, ingredients, layout, market research, modify, multiplication, opinion, pounds, sieve, sift, target audience
	'I can' The skills to be developed		<ul style="list-style-type: none"> • Explain the main types of fabric fastening. • Explain benefits and disadvantages of each fastening. • Design and write a product (personalised book sleeve) based on a design criteria which includes a fastening. • Make a paper template to test design criteria • Selecting appropriate materials, measure, mark and cut fabric using the paper template. • Select a stitch style to join fabric. • Sew neatly using small regular stitches. • Incorporate a fastening into the design. • Test and evaluate my product against the original design criteria to ensure it is fit for purpose. 		<ul style="list-style-type: none"> • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. • Making a torch with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a torch according to the design and success criteria. • Evaluating electrical products. • Testing and evaluating the success of a final product. 		<ul style="list-style-type: none"> • Designing a shape that reduces air resistance. • Drawing a net to create a structure from. • Choosing shapes that increase or decrease speed as a result of air resistance. • Personalising a design. • Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design. • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance. 	<ul style="list-style-type: none"> • Designing a biscuit within a given budget • Conducting market research. • Following a baking recipe • Understanding safety and hygiene rules. • Adapting a recipe. • Evaluating an adapted recipe. • Evaluating and comparing a range of products. • Suggesting modifications.

		TERM 1	TERM 2	TERM 3	TERM 4	TERM 5	TERM 6
Year 5	Topic	Electrical systems: Doodlers		Mechanical systems: Making a pop-up book		Cooking and Nutrition: Developing a recipe	
	'I Know' The knowledge to be learnt	<ul style="list-style-type: none"> • To know that series circuits only have one direction for the electricity to flow. • To know when there is a break in a series circuit, all components turn off. • To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. • To know a motorised product is one which uses a motor to function. • To know that product analysis is critiquing the strengths and weaknesses of a product. • To know that 'configuration' means how the parts of a product are arranged. 		<ul style="list-style-type: none"> • To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms. • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing. 		<ul style="list-style-type: none"> • To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed. • To know that recipes can be adapted to suit nutritional needs and dietary requirements. • To know that I can use a nutritional calculator to see how healthy a food option is. • To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. • To know that coloured chopping boards can prevent cross- 	

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						contamination. • To know that nutritional information is found on food packaging. • To know that food packaging serves many purposes.
Key Vocabulary	Circuit component • Configuration • Current • Develop • DIY • Investigate • Motor • Motorised • Problem solve • Product analysis • Series circuit • Stable • Target user		Aesthetic • Computer-aided design (CAD) • Caption • Design • Design brief • Design criteria • Exploded-diagram • Function • Input • Linkage • Mechanism • Motion • Output • Pivot • Prototype • Slider • Structure • Template			Abattoir • Adaptation • Balanced • Beef • Brand • Cook • Cross-contamination • Develop • Enhance • Equipment • Farm • Label • Measure • Nutrient • Nutrition • Nutritional value • Preference • Press • Process • Safety • Theme
'I can' The skills to be developed	<ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> 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. 			<ul style="list-style-type: none"> Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Writing an amended method for a recipe to incorporate the relevant changes to ingredients. Designing appealing packaging to reflect a recipe. Researching existing recipes to inform ingredient choices. Cutting and preparing vegetables safely. Using equipment safely, including knives, hot pans and hobs. Knowing how to avoid cross-contamination. Following a step by step method carefully to make a recipe. Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups.

		TERM 1	TERM 2	TERM 3	TERM 4	TERM 5	TERM 6
	Topic		Textiles: Waistcoats		Structures: Playgrounds		Digital World: Navigating the World
Year 6	'I Know' The knowledge to be learnt		<ul style="list-style-type: none"> To understand that it is important to design clothing with the client/ target customer in mind. To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. To 		<ul style="list-style-type: none"> To know that structures can be strengthened by manipulating materials and shapes. To understand what a 'footprint plan' is. To understand that in the real world, design , can impact users in positive and negative ways. 		<ul style="list-style-type: none"> To know that accelerometers can detect movement. To understand that sensors can be useful in products as they mean the product can function without human input. To know that designers write design briefs and develop design criteria to enable them to fulfil a client's

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		understand the importance of consistently sized stitches.		To know that a prototype is a cheap model to test a design idea.		request. • To know that ‘multifunctional’ means an object or product has more than one function. • To know that magnetometers are devices that measure the Earth’s magnetic field to determine which direction you are facing.
Key Vocabulary		Accurate • Adapt • Annotate • Design • Design criteria • Detail • Fabric • Fastening • Knot • Properties • Running-stitch • Seam • Sew • Shape • Target audience • Target customer • Template • Thread • Unique • Waistcoat • Waterproof		• Adapt • Apparatus • Bench hook • Cladding • Coping saw • Design • Dowel • Evaluation • Feedback • Idea • Jelutong • Landscape • Mark out • Measure • Modify • Natural materials • Plan view • Playground • Prototype • Reinforce • Sketch • Strong • Structure • Tenon saw • Texture • User • Vice • Weak		3D CAD • Application (apps) • Biodegradable • Boolean • Cardinal compass • Client • Compass • Concept • Convince • Corrode • Duplicate • Environmentally friendly • Equipment • Feature • Finite • Function • Functional • GPS tracker • If statement • InfiniteInvestment • Lightweight • Loop • Manufacture • Materials (wood, metal, plastic etc.) • Mouldable • Navigation • Non-recyclable • Product lifecycle • Product lifespan • Program • Recyclable • Smart • Sustainable • Sustainable design • Unsustainable design • Variable • Workplane
‘I can’ The skills to be developed		<ul style="list-style-type: none"> • Designing a waistcoat in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions. • Using a template when cutting fabric to ensure they achieve the correct shape. • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design. • Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating a waistcoat, attaching features (such as appliqué) using thread. • Finishing the waistcoat with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches. • Reflecting on their work continually throughout the design, make and evaluate process.. 		<ul style="list-style-type: none"> • Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs. • Building a range of play apparatus structures drawing upon new and prior knowledge of structures. • Measuring, marking and cutting wood to create a range of structures. • Using a range of materials to reinforce and add decoration to structures. • Improving a design plan based on peer evaluation. • Testing and adapting a design to improve it as it is developed. • Identifying what makes a successful structure. 		<ul style="list-style-type: none"> • Writing a design brief from information submitted by a client. • Developing design criteria to fulfil the client’s request. • Considering and suggesting additional functions for my navigation tool. • Developing a product idea through annotated sketches. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD. • Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). • 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. • Identifying key industries that utilise 3D CAD modelling and explaining why. • Describing how the product concept fits the client’s request and how it will benefit the customers. • Explaining the key functions in my program, including any additions. • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • 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 pitch.
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Progressive knowledge overview by strand.

Strand	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cooking and Nutrition		<ul style="list-style-type: none"> • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables is any edible part of a plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). 	<ul style="list-style-type: none"> • To know that 'diet' means the food and drink that a person or animal usually eats. • To understand what makes a balanced diet. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that 'ingredients' means the items in a mixture or recipe. 	<ul style="list-style-type: none"> • To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country.. • To know that eating seasonal foods can have a positive impact on the environment. • To know that similar coloured fruits and vegetables often have similar nutritional benefits. • To know that the appearance of food is as important as taste. 	<ul style="list-style-type: none"> • To know that the amount of an ingredient in a recipe is known as the 'quantity.' • To know that safety and hygiene are important when cooking. • To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping. • To understand the importance of budgeting while planning ingredients for biscuits. • To know that products often have a target audience. 	<ul style="list-style-type: none"> • To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed. • To know that recipes can be adapted to suit nutritional needs and dietary requirements. • To know that I can use a nutritional calculator to see how healthy a food option is. • To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. • To know that coloured chopping boards can prevent cross-contamination. • To know that nutritional information is found on food packaging. • To know that food packaging serves many purposes. 	<ul style="list-style-type: none"> • To know that 'flavour' is how a food or drink tastes. • To know that many countries have 'national dishes' which are recipes associated with that country. • To know that 'processed food' means food that has been put through multiple changes in a factory. • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).
Mechanisms/Mechanical Systems		<ul style="list-style-type: none"> • To know that a mechanism is the parts of an object that move together. • To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots, guides and an object. • To know that bridges and guides are bits of card 	<ul style="list-style-type: none"> • To know that different materials have different properties and are therefore suitable for different uses. • To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder. • To know that it is important to test my 	<ul style="list-style-type: none"> • To understand how pneumatic systems work. • To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air. 	<ul style="list-style-type: none"> • To understand that all moving things have kinetic energy. • To understand that kinetic energy is the energy that something (object/person) has by being in motion. • To know that air resistance is the level of drag on an object as it is forced 	<ul style="list-style-type: none"> • To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper- 	<ul style="list-style-type: none"> • To understand that all moving things have kinetic energy. • To understand that kinetic energy is the energy that something (object/person) has by being in motion. • To know that air resistance is the level of drag on an object as it is forced

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		<p>that purposefully restrict the movement of the slider.</p>	<p>design as I go along so that I can solve any problems that may occur</p>		<p>through the air. • To understand that the shape of a moving object will affect how it moves due to air resistance. • To understand that products change and evolve over time. • To know that aesthetics means how an object or product looks in design and technology. • To know that a template is a stencil you can use to help you draw the same shape accurately. • To know that a birds-eye view means a view from a high angle (as if a bird in flight). • To know that graphics are images which are designed to explain or advertise something. • To know that it is important to assess and evaluate design ideas and models against a list of design criteria.</p>	<p>based mechanisms. • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.</p>	<p>through the air. • To understand that the shape of a moving object will affect how it moves due to air resistance.</p>
<p>Structures</p>	<p>• To know there are a range to different materials that can be used to make a model and that they are all slightly different. • Making simple suggestions to fix their junk model. • To know that 'waterproof' materials are those which do not absorb water • To know that some objects float and others sink. • To know the different parts of a boat.</p>	<p>To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). • To understand that axles are used in structures and mechanisms to make parts turn in a circle. • To begin to understand that different structures are used for different purposes. • To know that a structure is something that has been made and put together. • To know that the sails or blades of a windmill are</p>	<p>• To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely</p>	<p>• To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the</p>			<p>• To know that structures can be strengthened by manipulating materials and shapes. • To understand what a 'footprint plan' is. • To understand that in the real world, design, can impact users in positive and negative ways. • To know that a prototype is a cheap model to test a design idea.</p>

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		<ul style="list-style-type: none"> moved by the wind. To know that a structure is something built for a reason. To know that stable structures do not topple. To know that adding weight to the base of a structure can make it more stable. 	<ul style="list-style-type: none"> to change or move. To know that a 'strong' structure is one which does not break easily. To know that a 'stiff' structure or material is one which does not bend easily. To know that natural structures are those found in nature. To know that man-made structures are those made by people. 	<ul style="list-style-type: none"> front of a structure. To understand that a castle needed to be strong and stable to withstand enemy attack. To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. To know that a design specification is a list of success criteria for a product. 			
Textiles	<ul style="list-style-type: none"> To know that a design is a way of planning our idea before we start. To know that threading is putting one material through an object. 	<ul style="list-style-type: none"> To know that 'joining technique' means connecting two pieces of material together. To know that there are various temporary methods of joining fabric by using staples, glue or pins. To understand that different techniques for joining materials can be used for different purposes. To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. To know that drawing a design idea is useful to see how an idea will look. 		<ul style="list-style-type: none"> To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. To know that when two edges of fabric have been joined together it is called a seam. To know that it is important to leave space on the fabric for the seam. To understand that some products are turned inside out after sewing so the stitching is hidden. 	<ul style="list-style-type: none"> To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. To know that different fastening types are useful for different purposes. To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions. 		<ul style="list-style-type: none"> To understand that it is important to design clothing with the client/target customer in mind. To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. To understand the importance of consistently sized stitches.
Electrical Systems					<ul style="list-style-type: none"> To understand that electrical conductors are materials which electricity can pass through. To understand that electrical insulators are materials which electricity cannot pass through. To know that a battery contains stored electricity that can be used to power products. To know that an electrical circuit must be complete for electricity to flow. To 	<ul style="list-style-type: none"> To know that series circuits only have one direction for the electricity to flow. To know when there is a break in a series circuit, all components turn off. To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. To know a motorised product is one which uses a motor to function. To know 	

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					<p>know that a switch can be used to complete and break an electrical circuit. • To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.</p>	<p>that product analysis is critiquing the strengths and weaknesses of a product. • To know that 'configuration' means how the parts of a product are arranged.</p>	
<p>Digital World</p>				<ul style="list-style-type: none"> • To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. • To know that a Micro:bit is a pocket-sized, codeable computer. • To know that a simulator is able to replicate the functions of an existing piece of technology. • To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result. • To understand what is meant by 'point of sale display.' • To know that CAD stands for 'Computer-aided design'. • To know what a focus group is by taking part in one. 			<ul style="list-style-type: none"> • To know that accelerometers can detect movement. • To understand that sensors can be useful in products as they mean the product can function without human input. • To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request. • To know that 'multifunctional' means an object or product has more than one function. • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.