St Peter's CofE Primary School: Design and Technology

We believe that all are made in the image of God. We seek to ensure that all are valued, valuable and empowered to be the best they can be. We learn from each other, developing our understanding of different cultures to ensure 'life in all its fullness', (John 10:10)
- the golden strand that runs through all our work.

How does our vision impact Design and Technology at St Peter's?

At St Peter's, we believe that every child is made in the image of God and has the creativity, curiosity and capability to make a positive difference in the world. Our Design and Technology curriculum empowers children to become thoughtful designers, problem-solvers and innovators who use their knowledge to improve the lives of others. Through designing, making, testing and evaluating products for real purposes and real users, pupils learn that good design begins with empathy, collaboration and a desire to serve others. As they progressively develop technical knowledge, practical skills and resilience, children learn to value mistakes as part of the design process, persevere through challenge and take pride in creating high-quality outcomes. By exploring sustainability, healthy living and technological innovation, we encourage pupils to think responsibly about their impact on the world around them so that they can flourish and experience 'life in all its fullness' (John 10:10).

Peace	Hope	Joy
Our curriculum teaches children to design with care and consideration for others. Through collaboration, evaluating different viewpoints and creating products that meet the needs of real users, pupils learn that thoughtful design can improve lives and contribute positively to their communities.	Through the iterative design process, children learn that improvement comes through perseverance, creativity and reflection. They develop confidence that challenges can be overcome, ideas can evolve and innovation can create a better future for people and the environment.	Design and Technology provides children with meaningful opportunities to imagine, create and make. Seeing an idea develop from an initial concept into a successful finished product inspires pride, curiosity and enjoyment while nurturing a lifelong appreciation of creativity and problem solving.

Design and Technology Whole School Curriculum Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
EYFS						
Year 1		Structures: Stable Structures		Textiles: Simple Stitches		Cooking and Nutrition: Smoothies
Year 2		Levers: Investigate Different Levers and How They Work.		Structures: A Chair for a Bear		Mechanisms: Making a Moving Monster
Year 3		Digital World: Wearable Technology		Cooking and Nutrition: Eating Seasonally		Structures: Product Packaging
Year 4		Electrical Systems: Torches		Mechanical Systems: Mechanical Cars		Structures: Helmets
Year 5		Mechanical Systems: Gears and Pulleys		Electrical Systems: Wobble Bots		Cooking and Nutrition: Developing a Recipe
Year 6		Textiles: Bags		Structures: Playground Pioneers		Digital World: Navigating the World

Year 1 Curriculum

Term	Links to the National Curriculum	Suggested Learning Questions	Associated Substantive and Disciplinary Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 2 **Structures: Stable Structures**	Explore and evaluate a range of existing products. Build structures, exploring how they can be made stronger, stiffer and more stable. Design purposeful, functional, appealing products for themselves and other users based on design criteria. Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Select from and use a 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 their ideas and products against design criteria. Build structures, exploring how they can be made stronger, stiffer and more stable.	What makes an object stable when balancing? How does a wide or narrow base affect the stability of a tower? How does adding weight in different places affect a structure's stability? How can we design a stable structure that meets a user's needs? How can we use different cutting and joining techniques to make a stable product?	Structures are built for a purpose and can be found in the world around us. A structure's stability is affected by how it is balanced. Wider bases make structures more stable than narrower bases. The design of a structure affects how stable it is. Testing and evaluating a structure help identify ways to improve it. A stable base is an important feature of a successful structure. Adding weight to the top of a structure makes it less stable. Adding weight to the base of a structure makes it more stable. Products should be designed to meet the needs and preferences of the intended user. Different cutting and joining techniques can be used to make a strong and stable product.	Base: The bottom part of something that it stands on. Narrow: Goes a short way from one side to the other. Stable: Not likely to topple over. Structure: Something that is built to do a job. Unstable: Likely to topple over. Wide: Goes a long way from one side to the other. Freestanding: Can stand up on its own. Height: How tall something or someone is. Tower: A tall, narrow structure. Better: Nicer, easier to use or last longer. Compare: To say how things are the same or different. Weight: Something heavy. Worse: Less nice, harder to use or breaks easily. Design: To make, draw or write plans for something. Product: Something that people make to sell or use. User: The person that something is made for. Like: To find something pleasing. Dislike: To find something not pleasing. Cut: To split something into parts using a sharp tool. Even: All the same size. Explain: Tell someone about something clearly. Join: Stick one object to another.	Children begin their Design and Technology journey by exploring simple structures because this provides an accessible introduction to designing, making, testing and evaluating. They develop an understanding that products are created for a purpose and that changing materials and shapes affects performance. This establishes the fundamental design cycle that will underpin all future learning before progressing to more complex structures and mechanisms in Key Stage 2.
Spring Term 4	Select from and use a range of tools and equipment to perform practical	How are fabrics made and used	Fabrics are materials that can be used to make a variety of everyday objects and products.	Even: The same space between two things. Fabric: A material made by weaving or knitting threads together.	Having explored how structures are made, pupils

Textiles: Simple Stitches	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. Explore and evaluate a range of existing products. 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.	for different purposes? How can I thread a needle and use stitches to join fabric? How can I sketch a design for a piece of bunting? How can I stitch a design for a piece of bunting? How can I finish my stitched design and evaluate the final product?	Different fabrics have different colours, patterns, textures and properties. Weaving is a method of making fabric by crossing threads over and under each other. A needle and thread can be used to join or decorate fabric through stitching. Stitches should be spaced evenly and follow a planned line or pattern. Designers choose colours, shapes and patterns to create appealing products. Sketches help designers communicate and develop their ideas before making. Different materials can be selected because of their texture and suitability for a purpose. Fabric designs can be marked out and then created using stitching techniques. Evaluating finished work helps identify strengths and suggest improvements in a helpful way.	Thread: A long, thin strand used for stitches and sewing. Weave: To cross threads or materials over and under. Needle: A small pointed tool for sewing, with a hole at one end for thread. Safety: Making good choices so nobody gets hurt. Space: A gap between things. Stitch: A loop of thread that joins fabric or makes a design. Straight line: A line that does not bend. Tools: Things used to help do a job. Design: A plan that shows how something will be made. Sketch: To make a quick drawing of an idea. Choose: To pick something from a group of things. Texture: What something feels like. Feedback: Helpful information that says what works well and how something can be made better. Like: To enjoy something or think it is good.	are introduced to textiles and simple joining techniques. This is the first opportunity to develop fine motor control using needles and thread whilst considering texture, appearance and user preference. These practical skills provide the foundation for increasingly sophisticated textile design and construction in Upper Key Stage 2. Links to Science- Properties and Uses of Materials
Summer Term 6 **Cooking and**	Understand where foods come from. Select from and use a range of tools and equipment to perform practical tasks.	How can I identify different fruits? Where do fruits and vegetables grow?	Fruits and vegetables are different foods that come from plants and can be identified by their characteristics.	Fruit: The part of a plant that contains the seeds. Plant: A living thing that grows in soil or water. Seed: New plants grow from it. Bush: A short, thick plant with many branches.	Cooking is introduced through simple food preparation that allows children to safely

Nutrition: Smoothies	Understand where foods come from. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Use the principles of a healthy and varied diet to prepare dishes. Evaluate their ideas and products against design criteria.	How can I prepare food safely? How can I select the best ingredients for a recipe? How can I apply food preparation skills when following a recipe? How can I evaluate my product against the design brief?	Fruits contain seeds, and seeds can grow into new plants. Different fruits and vegetables grow in different places on plants, including above and below the ground. Observing plants helps us predict where their edible parts will grow. Food preparation requires the safe use of tools such as forks, table knives and juicers. Following instructions and hygiene rules helps keep food preparation safe. Foods have different tastes and flavours that can be compared using the senses. Selecting ingredients involves making choices based on taste and suitability for a recipe. Recipes provide the ingredients and steps needed to make a food product. Evaluating products involves comparing outcomes, sharing opinions and considering how well they meet a design brief.	Leaf: The flat green part of a plant that grows from a branch or stem. Root: Part of a plant that takes water and other things from the soil. Soil: The top layer of earth that plants grow in. Stem: The long, thin part of a plant that holds it up. Tree: A tall plant with a thick stem called a trunk. Vegetable: Any part of a plant that you can eat. Vine: A plant with a long stem that grows on walls or along the ground. Chopping board: A thin, flat piece of wood or plastic for cutting things on. Cut: To make something smaller using a sharp tool. Fork: A small object with three or four points used to pick up food. Juice: To get the juice out of a fruit or vegetable. Juicer: Something used to get juice from a fruit. Table knife: A tool used for cutting. Flavour: The taste of a food or drink. Select: To choose something. Taste: To put food in your mouth to find out the flavour. Blend: To mix things together. Blender: A machine for turning soft foods into liquid. Cut: To use a knife to make something smaller. Ingredients: The foods needed to make a recipe. Juice: To get the juice out of a fruit or vegetable. Recipe: A list of foods and instructions telling you how to prepare something. Compare: To say how something is the same or different.	develop practical skills whilst learning where food comes from and making healthy choices. This builds naturally on their understanding of plants from science and prepares pupils to consider seasonality, nutrition and increasingly complex food preparation in later years.

				Evaluate: To decide how good or bad something is.	

Year 2 Curriculum

Term	Links to the National Curriculum	Suggested Learning Questions	Associated Substantive and Disciplinary Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 2	Select from and use a wide range of materials and components,	How is a seesaw a simple lever?	A lever is a simple mechanism that moves around a pivot.	Lever: Something that moves from a point or pivot.	Building on Year 1's

Levers: Investigate Different Levers and How They Work.	including construction materials, textiles and ingredients, according to their characteristics. Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. Explore and evaluate a range of existing products.	How can I build and test a simple lever? How are scissors a mechanism that uses two levers? How can I make a mechanism using two levers? How can I design a lever for everyday uses?	The position of a pivot affects how a lever moves and works. Many everyday objects, such as seesaws and scissors, use levers to create movement. Scissors are a mechanism made from two levers working together. Levers and pivots can be identified in products and mechanisms around us. Different materials can be selected and joined to create working levers. Testing a mechanism helps identify whether it works as intended. Changing the position of a pivot changes the movement and effectiveness of a lever. Levers can make tasks easier by helping people apply force more effectively. Designers use sketches, labels and evaluation to communicate ideas and improve products.	Mechanism: A set of parts that move together to make something happen. Pivot: The point where the lever moves from. Curved: Something that bends and is not straight. Direction: The way something moves or points. Rotate: To turn around a point. Material: What something is made of. Pivot: The point where the lever moves from. Purpose: The reason why something is made or used. Select: To pick something from a group of things. Evaluate: To think carefully about something and decide how good it is. Label: To add a word or group of words to show what a part of a picture is.	understanding that products are designed for a purpose, pupils are introduced to simple mechanisms for the first time. Exploring levers develops their understanding of movement and cause and effect before progressing to increasingly complex mechanical systems involving wheels, axles, gears and pulleys in later years.
Spring Term 4 **Structures: A Chair for a Bear**	Explore and evaluate a range of existing products. Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing].	How can I evaluate existing structures? How does the shape of a tower affect its strength?	Products are designed to meet the needs of a specific user and purpose. A design brief and design criteria help designers make successful products.	Chair: A structure made for sitting on. Design brief: A sentence that says what will be made and who it is for. Design criteria: Things that a design must have or do to work well. Purpose: What something is used or made for. User: The person something is made for.	Children revisit structures with greater challenge, applying their previous understanding of stability to

	Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Build structures, exploring how they can be made stronger, stiffer and more stable. 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. Evaluate their ideas and products against design criteria.	How does the thickness of a material affect its strength? How can I make a strong and stable chair for a user? How can I evaluate and improve a structure?	Different shapes have different strengths and can affect the performance of a structure. Testing materials and shapes helps designers understand their strength and suitability. Materials can be described using properties such as strong, weak, stiff and flexible. The thickness of a material affects its strength and stiffness. Different materials are selected for products based on their properties and intended use. Materials can be joined in different ways to create strong and stable structures. Testing and evaluating a product helps determine whether it meets the design criteria. Designers use evaluation and feedback to improve products and make them more suitable for the user.	Curved: A shape or line that bends smoothly and is not straight. Shape: The outline of something and how it looks on the outside. Strength: How well something can hold weight, resist breaking or keep its shape. Strong: Not easily broken. Weak: Easily broken. Flexible: Can bend without breaking. Material: What something is made of. Stiff: Does not bend easily. Thicker: Has more width or depth than something else. Thinner: Has less width or depth than something else. Join: To fix one thing to another. Measure: To find out how big, long or heavy something is. Select: To pick something from a group of things. Evaluate: Looking at what is good and bad about something and thinking about how to make it better. Improve: To make something better by helping it work well, look nicer or be more useful.	consider strength, stiffness and suitability for a specific user. Designing to meet a design brief develops the evaluative thinking that will become increasingly important throughout Key Stage 2.
Summer Term 6 **Mechanisms: Fairground Wheel**	Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Explore and evaluate a range of existing products.	How can I use a wheel mechanism in my fairground wheel design? Which materials are most suitable for my design?	Wheels and axles work together to help vehicles and mechanisms move. Designers evaluate existing products to identify successful features and areas for improvement.	Axle: A long, straight piece of material which connects to a rotating part (e.g. the wheels of a car). Axle holder: A part which holds the axle and allows it to rotate. Design: To make, draw or write plans for something. Design brief: A challenge that asks for something to be designed. Design criteria: A set of instructions for the project.	Having explored simple levers, pupils now combine their knowledge with wheels and axles to create moving products. This develops their

	Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. Design purposeful, functional, appealing products for themselves and other users based on design criteria. Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics. Evaluate their ideas and products against design criteria. Build structures exploring how they can be made stronger, stiffer and more stable.	How can I build and test a moving wheel? How can I conduct a simple survey to gather people's opinions? How can I finish and evaluate a structure with a rotating wheel?	Design ideas can be communicated clearly through labelled sketches and plans. Materials have different properties, and these influence their suitability for a product. Designers select materials based on their properties and the requirements of the design. A stable structure is important for supporting moving mechanisms safely and effectively. Testing models and prototypes helps identify problems and inform improvements. Wheel mechanisms require wheels, axles and supporting structures to rotate successfully. Surveys can be used to gather and record users' opinions to inform design decisions. Evaluating and adapting a finished product helps ensure it meets the design brief and user needs.	Ferris wheel: A ride at a fairground which carries passengers around a large, vertical wheel. Frame: A sturdy support that holds a fairground wheel in place. Pod: The container which carries passengers around the fairground wheel. Wheel: A circular object that turns around and can be fixed to a vehicle, like a car or a bicycle, to allow it to move easily over the ground. Model: A copy of a real object to show how it works or what it looks like. Rotate: Spinning around. Stable: An object that does not topple over easily. Strong: Something that is not easily broken (e.g. wood, brick or a building). Waterproof: A material that does not allow water to pass through it. Weak: Something that is easily broken. Mechanism: A set of parts of a machine that work together. Opinion: A thought about someone or something. Survey: Questions used to find out what people like. Decorate: To add details to a design to improve its appearance. Evaluate: Looking at what is good and bad about something and thinking about how to make it better. Test: To find out whether something works as it should.	understanding of how mechanisms work together and provides the essential foundations for the increasingly complex mechanical systems studied throughout Key Stage 2.

Year 3 Curriculum

Term	Links to the National Curriculum	Suggested Learning Questions	Associated Substantive and Disciplinary Knowledge	Key Vocabulary	Why This Why Now

Autumn Term 2 **Digital World: Wearable Technology**	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. Investigate and analyse a range of existing products. Understand how key events and individuals in design and technology have helped shape the world. apply their understanding of computing to program, monitor and control their products. Generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.	What can I learn from researching and evaluating existing products? How can I develop design criteria for a product? How can I use code to program and control a product? How can I develop and communicate my design ideas? How can I develop design ideas using computer-aided design (CAD)? How can I improve a design using feedback?	Digital products have changed over time in response to new technologies and user needs. Products are designed to be useful for specific users and purposes. Designers identify a target user and consider their needs when creating a product. Design criteria help guide decisions about how a product should function and appear. Programming uses coded instructions to control the functions of electronic devices. Testing and debugging code helps identify and correct errors. Annotated diagrams and sketches help designers communicate and develop their ideas. Computer-aided design (CAD) software can be used to create and refine product designs. Point of sale displays are designed to attract customers and promote products. Evaluation and feedback help designers improve products and make them more effective for users.	Analogue: Something that is electronic but doesn't use computer technology. Analyse: Look at something in detail. Digital: Something that uses computer technology. Form: The shape of something. Function: What something does. Smart: A device that works on its own. Technology: Something created to solve a problem, often using recent scientific discoveries. Criteria: How you know that your product is a success. Design brief: The reason to design a product. Evaluate: Checking whether a product works as it should. Feature: A part of the product that makes it stand out. Control: To ensure something works in the way that it should. Electronic: A device that uses components that use electricity. Initiate: To start a program. Loops: A set of instructions that goes back to the beginning once it gets to the end. Monitor: To observe the changing quality of something. Program: Coded instructions to control a device, often a computer. Sense: To detect a change. Simulator: A program that imitates the controls and operations of a device. Annotate: Add notes to a diagram or picture to help explain it. Fastening: A device that secures something. Product concept: A visual plan of an invention to share with others. Badge: A colourful shape used on a display to promote the sale of an item. Computer-aided design (CAD): Computer software that allows 2D and 3D design.	Lower Key Stage 2 begins by introducing digital technologies within Design and Technology. Building on pupils' computing knowledge, they learn that technology can be programmed to solve real-world problems while developing more sophisticated research, design and evaluation skills. This prepares them for later electrical and digital systems whilst strengthening cross-curricular links with Computing.

				Layers: The order in which objects in a CAD project are displayed. Net: The flattened opened-out version of a 3D shape. Point of sale: A part of a shop where you pick the item you intend to buy. Feedback: Using information from reactions to a product to help improve the design. Focus group: A small group of people who discuss something specific. Opinion: A view about something that isn't based on facts.	
Spring Term 4 **Cooking and Nutrition: Eating Seasonally**	Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. 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. Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.	Why does food come from different places around the world? What are the benefits of eating seasonal foods? How can I cut and peel food safely and effectively? Which fruits and vegetables are in season and what flavours do they have? How can I use design criteria when developing a mock-up? How can I evaluate a dish?	Different fruits and vegetables grow in different countries because they need specific climates and growing conditions. Climate zones influence which foods can be grown successfully in different parts of the world. Some foods cannot be grown in the UK and must be imported from other countries. Importing food can have an impact on the environment due to transportation and distribution. Seasonal foods are grown and harvested at particular times of the year in the UK. Recipes can be planned using seasonal ingredients that are available locally. Food preparation requires the safe and appropriate use of kitchen equipment.	Climate: The weather conditions that an area usually has. Country: An area of land that has its own government. Mediterranean: A climate with hot, dry summers and warm, wet winters. Mountain: A cold climate where trees do not grow. Polar: A cold climate where rain falls as snow. Temperate: A climate with four seasons like the UK. Tropical: A hot climate with a lot of rain. Export: Food sold to another country. Import: Food bought from another country. Seasonal: Food that grows at a certain time of the year. Seasons: One of the four times of the year; winter, spring, summer and autumn. Cut: To use a knife to make food smaller. Peel: To remove the skin of fruit or vegetables. Snip: To use scissors to make food smaller. Fruit: Something containing seeds that grows above ground. Ingredients: Foods that a recipe is made from. Taste: The flavour of a particular food. Texture: The way food feels in your mouth. Vegetable: A part of a plant that you eat.	Pupils extend their Year 1 understanding of healthy eating by considering where food comes from, sustainability and seasonal produce. This links directly with their science learning about digestion and food chains whilst encouraging informed choices about food production and environmental impact before developing recipes independently in Year 5.

			Different foods require different preparation techniques, such as cutting, peeling or cooking. Designers use design criteria to create food products that meet a specific purpose and user need. Evaluating ingredients for their colour and nutritional benefits helps create healthy and appealing dishes.	Complementary: Things that go together, like colours or flavours. Design: A plan for something. Mock-up: A model of how something might look. Appearance: The way something looks. Evaluate: To decide how good something is.	
Summer Term 6 **Structures: Product Packaging**	Investigate and analyse a range of existing products. 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. Apply their understanding of computing to program, monitor and control their products. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. Select from and use a wider range of tools and equipment to perform practical tasks [for	How are 3D shapes used in product packaging? How can I design nets for 3D product packaging? How can I review and improve net designs for packaging? How can I make a 3D structure to package a healthy snack? How can I use a design brief to finalise and evaluate packaging?	Packaging is designed to protect, contain and promote products. Different 3D shapes have different strengths and are used for different packaging purposes. Nets are flat templates that can be folded to create 3D packaging. Design criteria help designers make decisions about the form and function of packaging. Computer-aided design (CAD) can be used to create and modify accurate net designs. Feedback helps designers identify errors and improve their designs. Tabs are important features that allow packaging nets to be assembled successfully. Shell structures can be strengthened through reinforcement techniques such as ribbing.	Form: The shape or structure of something. Net: The flat shape made when a 3D shape is unfolded. Three-dimensional: An object that is not flat but has height, width and depth. Accurate: Correct, exact and without mistakes. Computer-aided design (CAD): A computer program that helps people draw and design on the screen instead of on paper. Sustainable: Looking after the world by using things that do not harm the planet and can be used again or recycled. Feedback: Helpful information that explains what works well and how something can be improved. Tab: Small flaps on the sides of a net that are taped or folded and glued so a 3D shape holds together. Reinforce: To make something stronger or more difficult to break. Shell structure: A hollow shape with a thin outer layer. Strengthen: To make a structure stronger so it can support more weight or resist forces like pushing or pulling. Function: The purpose that something is designed to do.	Returning to structures allows pupils to apply their growing understanding of design criteria, user needs and computer-aided design. They develop more accurate construction techniques whilst learning how form and function work together, preparing them for increasingly complex structural design in Upper Key Stage 2.

	example, cutting, shaping, joining and finishing], accurately. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.		Making packaging involves accurate cutting, folding and joining techniques. Evaluation helps designers judge how well a package meets the design brief and communicates its purpose.		

Term	Links to the National Curriculum	Suggested Learning Questions	Associated Substantive and Disciplinary Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 2 **Electrical Systems: Torches**	Investigate and analyse a range of existing products. Understand how key events and individuals in design and technology have helped shape the world. Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]. Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided 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. 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	How do electrical items work? How do torches work and what makes them effective? How can I design a product that meets a user's needs? How can I make and evaluate a torch?	Electrical products use electricity to perform a function and solve everyday problems. Batteries store electrical energy that can be used to power circuits and products. Conductors allow electricity to flow through a circuit, while insulators prevent the flow of electricity. A torch works using a series circuit that includes components such as a battery, switch, wires and a bulb or LED. Different torch designs have different strengths and weaknesses depending on their purpose and user. Designers develop design criteria by considering the needs of a specific user and the intended function of a product. Design ideas can be communicated through sketches and plans that meet identified success criteria. Making a working product requires accurate construction techniques and the safe use of tools and materials. Testing a circuit helps identify whether a product works as	Battery: Made from two or more cells that provide electrical energy to power a circuit. Bulb: A part of a circuit made from glass or plastic that gives light when electricity passes through it. Buzzer: A part of a circuit that makes a buzzing noise when electricity passes through it. Conductor: A material that allows electricity to flow through it, such as metal. Circuit diagram: A drawing that shows how an electrical or electronic circuit is set up. Electrical item: Objects that need electricity to work, such as hair dryers, toasters and kettles. Electricity: A type of energy that is usually invisible and can be made or stored to make things work, such as moving or heating objects. Electronic item: Electrical items that have a computer processor inside, such as mobile phones and laptops. Insulator: A material that does not let electricity flow through it, such as plastic. Series circuit: A closed circuit where the current flows in one path. Switch: A part of a circuit that can open or close to allow electricity to flow or stop it from flowing, such as a light switch that turns lights on or off. Wire: A thin piece of copper that conducts electricity and connects circuit components together. Component: The different parts that make an electrical circuit. Design criteria: A set of instructions for the project.	This unit introduces electrical systems for the first time, building directly upon pupils' science learning about circuits. Children apply their scientific understanding within a purposeful design context, recognising how electrical systems solve everyday problems and preparing for increasingly sophisticated electrical products in Year 5.

	and ingredients, according to their functional properties and aesthetic qualities. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.		intended and informs improvements. Evaluation helps designers judge how successfully a product meets the design criteria and user needs.	Evaluation: Looking at the good and bad points about something and thinking about how to improve it. LED (light emitting diode): A small device that produces light, often used in electronic equipment. Shape: The form or outline of something. Target audience: A person or particular group of people at whom a product is aimed. Torch: A battery-powered light that can be carried. Design: To make, draw or write plans for something. Assemble: To fix all parts together. Model: A copy of a real object to show how it works or what it looks like. Test: To find out whether something works as it should.	
Spring Term 4 **Mechanical Systems: Mechanical Cars**	Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided 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. 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	How can I build a simple prototype car chassis? How can I build a prototype of a sustainable slingshot car chassis? How can I build a durable prototype slingshot car chassis? How can I design a mechanised toy car? How can I make a mechanical toy car from a kit?	Automobiles have changed over time as designers have improved their speed, safety, comfort and efficiency. Prototype vehicles can be tested and evaluated by measuring how far they travel on an inclined plane. Designers use measurements and test results to compare the effectiveness of different designs. Materials have different properties, and sustainable materials can be chosen to reduce environmental impact. Exploded diagrams help designers communicate how parts fit together in a product. Durable materials are selected to make products stronger and longer-lasting.	Distance: The amount of space between two points. Inclined plane: A flat surface that is tilted at an angle. Biodegradable: Breaks down naturally and safely in the environment. Durable: Strong and lasts a long time without breaking. Exploded diagram: A picture that shows how the parts of something fit together by spreading them out. Non-renewable: Cannot be replaced within a human lifespan once it is used up (oil, coal and gas). Recycled: Has been used before and then turned into something new. Renewable: Can be replaced or regrown quickly, like trees or sunlight. Sustainable: Can be used without running out or harming the environment. Absorbent: Soaks up water. Flexible: Easily bent or squashed without breaking. Rigid: Stiff and does not bend easily.	Building on Year 2 mechanisms, pupils now investigate more advanced mechanical systems whilst considering sustainability, testing and product performance. They learn that prototypes can be refined through evaluation, strengthening both engineering thinking and resilience before

	components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. Understand how key events and individuals in design and technology have helped shape the world. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.		Design criteria are developed from a problem statement and guide the design process. Market research helps designers understand the needs and preferences of a target audience. Sketches and annotations are used to communicate and develop design ideas. Evaluation and user feedback help designers improve products and refine designs to better meet the needs of the target audience.	Waterproof: Water cannot pass through. Cost-benefit analysis: Comparing the good and bad things about a choice to decide if it is worth the cost. Design criteria: The important rules and features that something must have when being created. Market research: Gathering information from a target audience. Problem statement: Details the problem's context, target audience, why it is important to solve and any constraints involved. Feedback: A product user explains what they like and suggests improvements. Target audience: The specific group of people that something is made for or aimed at.	exploring gears and pulleys in Year 5.
Summer Term 6 **Structures: Helmets**	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.	How can I explore shell structures and design my own? How can I make the shell of a helmet? How can I assess how a helmet structure needs to be strengthened?	Shell structures are hollow structures with a thin outer layer that are designed to protect what is inside. Helmets are shell structures designed to protect the user's head by absorbing and spreading impact forces. Designers consider the needs of a specific user when selecting features for a helmet.	Helmet: A hard hat you wear on your head to protect it. Protect: To keep someone or something safe. Shell structure: A hollow shape with a thin outer layer. Structure: Something that has been built or put together to hold its shape and serve a purpose. Fibreglass: A strong, lightweight material made by setting glass fibres in glue-like resin to make a hard shell. Hollow: An object that is empty inside. Iteration: The process of doing something over and over again.	Pupils revisit structures with a greater emphasis on designing for safety and protection. They draw upon their previous understanding of materials, strength and construction to solve increasingly

	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 their ideas and products against their own design criteria and consider the views of others to improve their work. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. Investigate and analyse a range of existing products.	What techniques can I use to improve the strength of my helmet? How effective are the improvements I made to strengthen my helmet?	Layering materials can strengthen a shell structure and improve its protective qualities. Making and refining prototypes is an iterative process that involves reflection and improvement. Testing and analysing a product helps identify weaknesses and areas that need strengthening. Different strengthening techniques can be selected for different purposes and parts of a structure. Following a design plan and applying appropriate construction techniques helps create a stronger product. Communicating and collaborating with others can support the improvement of a design. Evaluation and feedback help designers judge how effectively a product meets its purpose and identify future improvements.	Reflect: To think carefully about something to understand it better and improve it next time. Layering: Putting materials or objects on top of each other. Lightweight: Something that is not heavy or weighs less than other items of its kind. Analyse: Study something closely and carefully to understand it better. Effective: Something working as it is intended to. Strengthen: To make a structure stronger so it can support more weight or resist forces like pushing or pulling.	complex design problems whilst considering how products must meet the needs of different users. This prepares them for large-scale structural design in Year 6.

Term	Links to the National Curriculum	Suggested Learning Questions	Associated Substantive and Disciplinary Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 2 **Mechanical Systems: Gears and Pulleys**	Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately. Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. Understand how key events and individuals in design and technology have helped shape the world. Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages].	How can I create a working gear system and explain how it works? How can I improve a working gear system and identify where it could be used? How can I create a working pulley system and explain how it works? How can market research help us decide what useful tasks an eco-gadget bike could perform? How can I use design criteria to design and evaluate an eco-gadget bike?	Gears are mechanical components that transfer motion and force between moving parts. Gear systems can change the speed, direction or force of movement in a mechanism. Accurate gear teeth and correctly positioned axles are important for a gear system to work effectively. Designers test and evaluate mechanisms to identify improvements and suitable real-world applications. Pulley systems use wheels and ropes to make lifting or moving objects easier. Design briefs and design criteria guide the development of successful products. Market research helps designers understand user needs and identify opportunities for new products. Problem statements define the purpose, audience and constraints of a design challenge. Annotated sketches are used to communicate design ideas and explain how products will function. Evaluation and feedback help designers refine products and judge	Force: A push, pull or twist. Gear: A wheel with teeth. Gear system: A set of gears that fit together to change the speed, direction or force of motion. Input: The motion used to start a mechanism. Machine: A tool or device that makes work easier by changing the size, speed or direction of a force. Mechanism: A system of moving parts. Output: The motion that happens as a result of starting the input. Axle: A long straight rod which connects to a rotating part (e.g. the wheels of a car). Teeth: The small bumps around the edge of a gear that fit into another gear to make it move. Pulley: A wheel with a groove and a rope or belt that fits into the groove. Pulley system: One or multiple pulleys used to reduce the effort needed to lift or move an object. Market research: Gathering information from a target audience. Problem statement: Details the problem's context, target audience, why it is important to solve and any constraints involved. Renewable energy: Energy generated from a source that is continuous, such as wind or water. Research: To study something in detail to discover new information or reach a new understanding. Sustainability: A way to complete a process without harming the environment. Annotate: Labels on a drawing that help to explain it.	Building directly on pupils' science learning about forces and mechanisms, this unit develops a deeper understanding of how mechanical systems transfer movement. Having previously explored simpler mechanisms, children are now ready to investigate how multiple components work together to solve increasingly complex engineering challenges.

	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.		how well they meet the design criteria.		
Spring Term 4 **Electrical Systems: Wobble Bots**	Investigate and analyse a range of existing products. Understand how key events and individuals in design and technology have helped shape the world. Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]. 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. 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.	How do motors work in electrical circuits? How can I make a motorised product and test how well it works? How can I use my knowledge of circuits to design and test a product? How can I design a motorised product for a specific purpose? How can I make and evaluate a successful motorised product?	Motors are electrical components that convert electrical energy into movement. A working circuit is needed to provide power to a motor and make it function. Many everyday products use motors to create movement and perform specific tasks. Designers use making and testing to identify and solve problems during the construction process. The form and function of a product influence how well it meets its intended purpose. Observations and testing help designers understand how different parts affect a product's performance. Changes made to a product can be evaluated to determine whether they improve its effectiveness. Research helps designers generate ideas and make informed design decisions. Design criteria provide a set of requirements that guide the	Battery: Made from two or more cells that provide electrical energy to power a circuit. Charge: An amount of electrical energy. Circuit: A path that electricity flows through to power components. Electrical components: The parts used to build an electrical circuit. Electricity: A type of energy used to power components like bulbs, buzzers or motors. Flow: To move smoothly from one place to another, like electricity through a wire. Motor: A component that turns electricity into movement. Product: Something that has been made to be used or enjoyed by someone. Risk: The chance that something might go wrong or cause harm. Wire: Connects the parts of a circuit. Off-centre: Something that is positioned away from the middle. Improve: To make something better by helping it work well, look nicer or be more useful. Investigate: To look closely at something to find out how it works or why something is happening. Label: Text used to explain parts of a drawing. Sketch: A simple drawing showing your ideas without lots of details. Trial and error: Trying different ways to do something and learning from mistakes until the best solution is found. Annotate: Labels on a diagram that help to explain it.	This unit revisits electrical systems with greater independence and complexity. Pupils combine their understanding of circuits, mechanisms and user-centred design to create functioning products, strengthening problem-solving and preparing them for independent design projects in Year 6.

	Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.		development of a successful product. Evaluation helps designers judge how well a motorised product meets its purpose and identify improvements.	Design brief: Description of the purpose and user of a product. Design criteria: The important features that a product must have or do to work correctly. Diagram: A drawing that shows an idea. Purpose: What something is for. Thumbnail sketch: Simple drawings to get ideas down on paper quickly. User: The person a product is made for. Assemble: To put parts together. Evaluate: Looking at the good and bad points about something and thinking about how to improve it.	
Summer Term 6 **Cooking and Nutrition: Developing a Recipe**	Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. Understand and apply the principles of a healthy and varied diet. Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. 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,	How are ingredients reared and processed before they become food? How can I adapt a recipe to meet a design brief? How do I evaluate the nutritional content of food? How can I use food preparation skills safely and effectively? How can I design an effective product label? How can I follow and adapt a recipe to meet a specific need?	Ingredients come from plants and animals and may go through several stages before becoming food products. Food products, such as spaghetti bolognese, are made from a range of ingredients that each contribute to the final dish. Ingredients can be sourced, processed and transported from farm to table before reaching consumers. Recipes can be adapted by changing ingredients to meet different tastes, dietary requirements or design intentions. Nutritional information can be used to compare foods and make informed ingredient choices. Safe food preparation requires good hygiene practices, accurate cutting	Abattoir: A place where animals are killed and processed into meat. Beef: Meat from a cow. Farm: To grow crops or keep animals as a business. Ingredients: The foods a recipe is made from. Process: A series of actions. Adaptation: The process of changing something. Enhance: To improve something. Preference: Liking one thing more than another. Evaluate: Discuss whether something is a good choice or not. Justify: Explain why something is chosen. Nutrient: Substances that help living things stay healthy and grow. Nutritional value: The nutrients a food or recipe provides. Cook: To prepare food by heating it. Cross-contamination: When something harmful spreads from one food to another. Cut: To make something smaller with a knife. Equipment: Tools for a purpose.	Having previously prepared recipes and explored seasonality, pupils now design and adapt recipes independently. They make informed decisions about nutrition, taste and presentation whilst evaluating products against design criteria. This represents the culmination of the cooking and nutrition strand, combining practical skill with informed

	joining and finishing], accurately.		techniques and the prevention of cross-contamination. Different preparation techniques and equipment are suitable for different ingredients and cooking tasks. Product labels communicate important information and can be designed to appeal to a particular audience. Design criteria help designers evaluate packaging and labels and identify areas for improvement. Recipes, measurements and instructions help ensure food products are made accurately and consistently.	Grate: To make food smaller by rubbing it against a grater. Hygiene: Keeping things clean to prevent illness. Measure: To take the correct quantity of something. Press: To squash something to release flavours. Safety: Preventing risk. Brand: A type of product made by a company and sold using a name. Theme: To design something to fit a subject. Design: To make or draw plans for something. Label: Something that provides information about the product it is attached to. Balanced: A combination of the correct types and amounts of foods. Nutrition: The things that go into your body as food. Recipe: A set of instructions for how to cook a dish.	decision making.

Term	Links to the National Curriculum	Suggested Learning Questions	Associated Substantive and Disciplinary Knowledge	Key Vocabulary	Why This Why Now
Autumn Term 2 **Textiles: Bags**	Investigate and analyse a range of existing products. Understand how key events and individuals in design and technology have helped shape the world. 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. 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.	How are pattern pieces used to design and make fabric items? How can I use pattern piece templates to shape, cut and stitch fabric? How can I design a bag and create prototype pattern pieces? How can I create a prototype bag from a design sketch? How can I add practical and aesthetic features to improve my bag?	Pattern pieces are templates that help designers cut fabric to the correct shape and size. Fabric products are made by combining pattern pieces, cutting fabric accurately and joining pieces together. Seam allowances provide space for fabric pieces to be sewn together without changing the intended size of the product. Running stitch is a basic sewing technique that can be used to join fabric pieces securely. Accuracy in cutting, folding and pinning helps ensure a product is assembled correctly. Design criteria and design briefs guide the design and manufacture of a product. Designers communicate ideas through labelled sketches and use these to create pattern pieces. Prototypes allow designers to test and refine ideas before creating a final product. Practical and aesthetic features can be added to improve a product's function and appearance.	Pattern piece: A paper shape used to cut fabric to the right size and shape for making items such as bags or clothing. Seam: The line where two pieces of fabric are sewn together to hold them in place when making items such as clothes, bags or toys. Seam allowance: The space between the edge of the fabric and the sewing line that allows the pieces to be joined without sewing into the main part. Blanket stitch: A sewing stitch used around the edge of fabric to make a neat border of looped stitches. Cross-stitch: A decorative sewing stitch made with small X shapes on fabric. Fabric: A woven or knitted material made from natural fibres such as cotton or wool, or man-made fibres such as polyester. Running stitch: A basic sewing stitch made in a straight line by moving the needle in and out, leaving small gaps between each stitch. Properties: The features that describe what something is like. Prototype: A model made to test what a final product will look like or how it will work. User: The person a product is made for. Aesthetic: The way something looks. Innovative: Thinking of new and creative ideas that are different from what people have done before. Functionality: How well something works to do what it is supposed to do.	Pupils revisit textiles with greater independence and precision, building on the sewing and joining techniques first introduced in Year 1. They now make increasingly informed decisions about materials, construction methods and product design to create functional products that meet the needs of a specific user. This unit draws together their growing understanding of planning, making and evaluating, whilst preparing them for the increasingly independent design and technology they will encounter

	Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.		Evaluation helps designers judge how effectively a product meets its design criteria and the needs of the user.		beyond primary school.
Spring Term 4 **Structures: Playground Pioneers**	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. Investigate and analyse a range of existing products. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. 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	How can I generate ideas for a playground structure while considering design constraints? How can I create a prototype of my design using Tinkercad? How can I construct a scale prototype of a playground structure? How can I complete and improve the appearance of my structure prototype? How can I evaluate a prototype of a playground structure?	Design constraints influence decisions during the design process, and some constraints are more important than others depending on the purpose and user. Designers use annotated sketches and CAD models to communicate, develop and refine their ideas. Playground structures must be designed with factors such as safety, accessibility, inclusion, sustainability, strength and stability in mind. Designers evaluate and select ideas by considering how well they meet the design criteria and constraints. Frame structures can be strengthened through reinforcement, bracing and triangulation. Different materials and tools are suitable for different construction tasks and should be selected appropriately. Planning, including creating equipment lists and following safety procedures, supports successful construction. Scale prototypes are used to test and communicate design ideas before a final product is built.	Accessible: Something that is designed so that disabled people can use it safely and independently. Aesthetic: How something looks. Constraint: A limit or condition when making a product. Frame structure: A rigid framework of connected beams that provide support for a building or construction. Inclusive: Something that is designed so that everyone can feel included, whatever their background or needs. Innovative: Something that is new, creative or solves a problem in a clever way. Prototype: A model used to show what a final product will look like or how it will work. Shell structure: A hollow shape with a thin outer layer. Sustainable: Using resources responsibly so the planet is not damaged or resources are not used up in the future. Bracing: Adding extra pieces to stop a structure from wobbling. Computer-Aided Design (CAD): Using a computer to draw or plan ideas for a product. Reinforce: To make something stronger by adding extra support or thicker materials. Triangulation: Making a structure stronger by adding triangles or diagonal supports.	This is the culmination of the structures curriculum. Pupils draw together everything they have learned about stability, strength, reinforcement, user needs and evaluation to design ambitious structures that solve authentic problems. The unit requires children to synthesise knowledge developed progressively since Year 1.

	their functional properties and aesthetic qualities. 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.		Finishes can be both functional and aesthetic, improving a product's appearance, durability and usability. Evaluation helps designers judge the success of a structure, justify design decisions and identify more sustainable alternatives.	Construct: To build or put something together. Equipment list: A list of tools and materials needed to make something. Saw: A tool used to cut wood. Bench hook: A piece of equipment used to hold wood in place while sawing. Cladding: A layer that covers the outside of a structure. Decorate: To add things to improve how something looks. Finish: The final surface and appearance of a product. Function: What something is used for. Stabilise: To make something steady and stop it from moving or falling. Strengthen: To make something stronger by reinforcing parts. Advantages: Something that is helpful or gives a better chance of success. Alternative: A different option that can be chosen. Carbon footprint: The amount of carbon dioxide released into the air due to an activity or process. Disadvantages: Things that are not helpful or make something harder or less effective.	
Summer Term 6 **Digital World: Navigating the World**	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. Apply their understanding of computing to program, monitor and control their products. Generate, develop, model and communicate their ideas through discussion, annotated	How can I write a design brief and design criteria based on a client's request? How can I write a program with multiple functions for a navigation device? How can I develop a sustainable product concept?	Design briefs are created from client requests and identify the purpose, user and requirements of a product. Design criteria provide a clear set of requirements that guide design decisions and measure success. Programming uses code, including variables, loops and selection, to create products with multiple functions. Navigation devices can use programmed functions such as	Application (app): A computer program designed for a particular purpose. Client: A person or company who receives a service from a professional (such as a designer). Compass: Uses the Earth's magnetic pull to guide you using cardinal directions (north, east, south and west). GPS tracker: Indicates where you are on a map using coordinates. Navigation: Finding a way from one place to another.	The curriculum concludes by revisiting digital technology at its most sophisticated level. Pupils apply their understanding of programming, product design and user needs to solve real-

	sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities. Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.	How can I use 3D CAD software to turn my ideas into a virtual model? How can I present a persuasive pitch to sell my product to a client?	compasses, pedometers and GPS tracking to help users find their way. Products can be improved by adding functions that better meet the needs of the user or client. Sustainable design considers the environmental impact of materials, manufacturing and product lifespan. Materials have different functional properties, and these properties influence their suitability for a product. Annotated sketches and product concepts help designers communicate and develop ideas. 3D CAD software can be used to create, manipulate and refine virtual models of products. Designers present and justify their ideas by explaining how a product meets the client's requirements, benefits users and fulfils the design criteria.	Pedometer: Counts the number of steps you have taken. Smart: A device with processing capabilities. Smartphone: A mobile phone that can be used as a small computer and connects to the internet. Tablet: A small, flat computer that is controlled by touching the screen. Boolean: A form of data which consists of true (1) and false (0) values. If statement: An instruction that makes a program respond based on one or more conditions (e.g. if it is below 10°C, turn on the heating; otherwise, turn the heating off). Loop: A piece of code that repeats until instructed to stop. Program: A series of code which instructs an electronic device to perform specific tasks. Variable: A number, amount or text that can change each time a program is run and is often used to change the outcome of the program. Biodegradable: Materials that break down and form part of the soil as part of the natural decomposition process. Concept: A visual plan of an invention or idea to share with others. Corrode: A metal which is destroyed slowly over time by acid or rust. Environmentally friendly: Does not cause harm to nature (animals, plants etc.). Finite: Limited in number and will eventually run out. Functional properties: The properties that some materials have that make them useful. Infinite: A resource without limit or end.	world problems using technology. This provides a fitting culmination to the Design and Technology curriculum, demonstrating how creativity, engineering and digital innovation combine to improve everyday life.

				Mouldable: Can be made into any shape. Non-recyclable: Products or materials that cannot be used again. Product lifecycle: How long an object is expected to last before becoming unusable. Product lifespan: How long an object will last before being recycled. Recyclable: Products or materials that can be recycled and used again. Sustainable design: Designing products which cause little or no damage to the environment. Unsustainable design: Products made from non-recyclable or finite materials that are limited in supply. 3D model: A three-dimensional representation of an object. CAD: Computer-aided design. CGI: Computer-generated imagery. Consumables: Goods or materials that are quickly used and need replacing. Manoeuvre: To turn an object. Opaque: Prevents light from travelling through it so it is not transparent or translucent. Replica: An exact copy of an object but usually smaller in size. Shape properties: Details of 2D shapes, such as the angles and number of sides. Tinkercad: Free-to-use three-dimensional computer-aided design software. Transparent: A material or object you can see through very clearly. Virtual: Created by computers but does not exist in the real world.	