EYFS	Through teaching and continuous provision, DT in EYFS enables children to: • Hold conversation when engaged in back-and-forth exchanges with their teacher and peers. • Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary. • Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, nonfiction, rhymes and poems when appropriate. • Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher. • Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate. • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. • Use a range of small tools, including scissors, paintbrushes and cutlery. • Share their creations, explaining the process they have used. • To describe something they want to make / build / construct. • To say who they are making / building / constructing for. • To talk about what materials they are going to use when making / building / constructing. • To make / build / construct objects using a variety of materials.	• To join materials together when making / building /constructing. • To talk about their constructions and say how it could be even better. • To talk about everyday objects that they like and say why they are good. • To build / construct structures from a range of materials to a design brief that they have created or been given. • To build / construct structures that are tall or strong. • To know that tape and glue can join materials together and can make structures stronger. • To recognise different foods as either healthy or unhealthy. • To know how to use basic cutlery and utensils to make and eat food. • To follow simple instructions to make different foods. • To know when we make food for other people that it needs to be appealing

Class	Cycle	Aut 1 / Aut 2	Spr 1 / Spr 2	Sum 1 / Sum 2
Year 1/2	A	**Structures: Stable structures** Exploring the stability of structures and making a stable pencil pot for a specific user. **Unit outcomes** • Explain that structures are things that are built and have a purpose. • Understand that structures with a wider base are more stable than ones with a narrow base. • Explain that extra weight added to the base of a structure makes it more stable. • Design a product for a particular user. • Use a sketch to show ideas. • Choose the best method for joining the parts of the product. • Make evenly spaced cuts. • Use scissors to cut out a shape neatly and accurately. • Explain what they like and dislike about their final product.	**Textiles: Puppets** This unit hub can be used to inform your medium-term plan and to navigate to related resources. **Unit outcomes** • Join fabrics together using pins, staples or glue. • Design a puppet and use a template. • Join their two puppets' faces together as one. • Decorate a puppet to match their design.	**Cooking and nutrition: Smoothies** Preparing foods by cutting and juicing and selecting fruits and vegetables to create a smoothie to meet a design brief. **Unit outcomes** • Describe fruits and vegetables and explain how to identify fruits. • Name a range of places that fruits and vegetables grow. • Describe basic characteristics of fruit and vegetables. • Prepare fruits and vegetables to make a smoothie.
		Key knowledge **Design** • The user is the person who will use the product. • Different users may want different things from a design. • Who they are designing for makes a difference to what they design. • The purpose is what something is for. • Existing products can help when deciding what to design. • Drawings are a way to explain ideas. **Make** • A plan is deciding what to do first and next. • Different equipment does different things. • Names of common pieces of equipment. • Some tools are sharp like scissors and knives. • Spacing cuts or marks evenly can be useful.	**Key knowledge** • 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.	**Key knowledge** • That a blender is a machine which mixes ingredients together into a smooth liquid. • That a fruit has seeds and a vegetable does not. • That fruits grow on trees or vines. • That vegetables can grow either above or below ground. • That vegetables are any edible part of a plant.

		• Different glue can be used to join different things. **Evaluate** • Some products will be better than others. • Their ideas or products can be made better. • Their ideas can make someone else's work better. • Other people's ideas can help make their work better. **Technical knowledge** • A structure is something that has been made and put together. • Stable structures do not topple. • Shapes and structures with wide, flat bases or legs are the most stable. • Adding weight to the base of a structure can make it more stable.		
		Key skills **Design** • Thinking about what others might want from a design. • Beginning to recognise how products and designs in the world around us solve certain needs. • Considering who they are designing for – identifying the user. Stating what they intend to make and why – identifying the purpose. • Talking about ideas, with purpose and user in mind. • Talking about existing products when generating ideas. • Using basic drawing skills to communicate ideas. **Make** • Choosing between a small number of materials, ingredients or components. • Explaining their choices based on personal experiences. Requesting equipment appropriate to the purpose (e.g. scissors for cutting, glue for joining, etc.). • Beginning to use objects with a fixed width or length to create even spacing of markings or cuts (e.g. a lolly stick). • Refining their grip to cut competently and confidently. • Cutting straight and evenly spaced lines. • Beginning to cut large shapes and thicker materials like card. **Evaluate** • Discussing existing products, saying what they like about them. • Comparing two products and discussing which is better for a specific purpose. • Saying what they like about their peers' designs and products. • Accepting feedback and understanding it is meant to improve their work. **Technical knowledge** • Recognising that different structures are used for different purposes. • Exploring the features of structures. • Describing structures as buildings or freestanding structures.	**Key skills** • 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.	**Key skills** • Designing smoothie carton packaging by hand. • Chopping fruit and vegetables safely to make a smoothie. • Juicing fruits to make a smoothie. • Identifying if a food is a fruit. • Learning where and how fruits and vegetables grow. • Tasting and evaluating different foods. • Describing appearance, smell and taste. • Suggesting information to be included on packaging.

		• Making stable structures from card. • Creating supporting structures to aid stability. • Using stable objects like cylinders to create structures.		
		Key vocabulary • base • better • compare • design • freestanding • stable • structure • unstable • user • worse	**Key vocabulary** • decorate • design • fabric • glue • model • hand puppet • safety pin • staple • stencil • template	**Key vocabulary** • blend • blender • chopping board • compare • cut • design • evaluate • flavour • fork • fruit • healthy • ingredients • juice • juicer • leaf • plant • recipe • root • seed • select • smoothie • stem • table knife • taste • tree • vegetable • vine
Year 1/2	**B**	**Structures: A chair for a bear** Testing the strength of materials and making a strong and stable chair. **Unit outcomes** • Describe how chairs are made for different users and purposes. • Explain how design briefs and design criteria help when making a new product. • Name some shapes that are stronger than others. • Describe how making a material thicker makes it more stiff. • Understand and use the vocabulary of strong, weak, stiff and flexible. • Make a stable chair structure for a particular user. • Select suitable materials and join them securely. • Evaluate a product against the design criteria. • Improve parts of a product based on the design criteria.	**Mechanisms: Fairground wheel** Designing and creating a functional fairground wheel so that the wheel rotates and the structure stands freely. **Unit outcomes** • Describe how axles help wheels move a vehicle and design and label a working fairground wheel. • Evaluate different designs. • Describe the properties of different materials and select appropriate materials for the wheel. • Build a stable structure, test elements of the design and adapt the design as necessary. • Make the wheel rotate, evaluate a wheel mechanism and adapt it as necessary. • Recall that a survey is used to find out what people like, tally results and use the results to inform the design. • Add pods for the correct number of people and ensure that the pods stay upright when rotating around a fixed point. • Explain the decisions for the pod design.	**Mechanisms: Making a moving monster** This unit hub can be used to inform your medium-term plan and to navigate to related resources. **Unit outcomes** • Identify the correct terms for levers, linkages and pivots. • Analyse popular toys with the correct terminology. • Create functional linkages that produce the desired input and output motions. • Design monsters suitable for children, which satisfy most of the design criteria. • Evaluate their two designs against the design criteria, using this information and the feedback of their peers to choose their best design. • Select and assemble materials to create their planned monster features. • Assemble the monster to their linkages without affecting their functionality.
		Key knowledge **Design** • A design brief helps to decide what to make. • Design criteria are the steps for making a product successful. • Design criteria help when thinking of ideas.	**Key knowledge** • Everyday objects have mechanisms. • Many things that move have parts inside to help them work. • Mechanisms usually limit unwanted movement. • Everyday objects utilise wheels and axles. • Wheels must be able to turn to work effectively.	**Key knowledge** • 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 an output in a mechanism.

		• Different products work in different ways and have parts that make them work. **Make** • Some properties of materials, such as hard, soft, flexible, waterproof, strong, etc. • The names of some geometric shapes, such as triangle, pyramid, square, cube, circle and sphere. **Evaluate** • Existing products can be evaluated against design criteria. • Design criteria help to decide if their product is a success. • Improve means to make something better. **Technical knowledge** • A structure is something that has been made and put together. • The shape of a structure affects its strength. • Materials can be manipulated to improve strength and stiffness. • A strong structure is one which does not break easily. • A stiff structure or material is one which does not bend easily.	• Axles allow wheels to turn without falling off. • The features of a fairground wheel include the wheel, frame, pods, axle and axle holder.	• 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.
		<u>Key skills</u> **Design** • Using a simple design brief that outlines the intended use, target user and key features of the product to create simple design criteria. • Creating ideas with design criteria in mind. • Referring to specific parts of existing products when generating ideas. **Make** • Choosing materials, ingredients or components from a wider range of materials, ingredients or components. • Explaining their choices based on the properties of materials and components. • Looking for ways to make cutting easier, for example, turning the material they are cutting, not fully closing the scissors, etc. • Choosing known geometric shapes when making. • Beginning to shape objects to improve how they work. **Evaluate** • Discussing a range of existing products and saying what they like and dislike about them. • Comparing a range of products and explaining why some better meet different design criteria than others. • Evaluating their ideas and creations against simple design criteria. **Technical knowledge** • Recognising that different structures are used for different purposes. • Exploring the features of structures. • Making stable structures from card. • Creating supporting structures to aid stability.	**<u>Key skills</u>** **Design** • Conducting simple surveys or discussions to gather opinions on what others need or like in a design. • Knowing that a survey is used to find out what people like. • Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria. • Knowing that a design brief helps to decide what to make. • Knowing that design criteria are the steps for making a product successful. • Creating ideas with design criteria in mind. • Referring to specific parts of existing products when generating ideas. • Knowing that the design criteria help when thinking of ideas. • Using labels to explain parts of a design, label materials, etc. • Integrating moving parts when creating mock-ups. • Knowing that drawings can help explain how something works. • Knowing that a label explains part of a drawing. **Make** • Choosing materials, ingredients or components from a wider range of materials, ingredients or components. • Explaining their choices based on the properties of materials and components. • Knowing some properties of materials like hard, soft, flexible, waterproof, strong etc. • Following and recalling simple safety instructions. • Knowing that some tools are sharp like scissors and knives. • Choosing known geometric shapes when making. • Beginning to shape objects to improve how they work.	**<u>Key skills</u>** • Creating a design criteria for a moving monster as a class. • 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.

		• Using stable objects like cylinders to create structures. • Building a strong and stiff structure by folding paper. • Folding to strengthen or stiffen. • Comparing the stability of different shapes. • Identifying the weakest part of a structure.	• Knowing the names of some geometric shapes: triangle, pyramid, square, cube, circle, sphere. • Considering balance in their finishing, like evenly spaced decoration. **Evaluate** • Discussing a range of existing products and saying what they like and dislike about them. • Evaluating existing products against design criteria. • Evaluating their ideas and creations against simple design criteria. • Knowing that design criteria help to decide if their product is a success. • Suggesting improvements to their peers' designs and products. • Knowing that improve means to make something better. • Knowing that their suggestions can improve someone else's work.	
		Key vocabulary • design brief • design criteria • evaluate • flexible • improve • select • stiff • strong • thicker • thinner • weak	**Key vocabulary** • design brief • design criteria • evaluate • frame • model • opinion • rotate • survey	**Key vocabulary** • axle • design criteria • input • linkage • mechanical • output • pivot • wheel
Year 3		**Digital world: Wearable technology** Designing digital wearable technology and developing a program and housing for a Micro:bit. **Unit outcomes** • Give a brief explanation of the digital revolution and/or remember key examples. • Suggest a feature from the virtual micro:bit that is suitable for the product. • Write a program that initiates a flashing LED panel, or another pattern, on the virtual micro:bit when a button is pressed. • Identify errors, if testing is unsuccessful, by comparing their code to a correct example. • Explain the basic functionality of their finished program. • Suggest key features for a way to attach the product to the user, with some consideration for the overall theme and the user. • Create annotated diagrams to help illustrate how their product is worn. • Describe what is meant by 'point of sale display' with an example. • Follow basic design requirements using computer-aided design, drawing at least one shape with a text box and bright colours, following a demonstration. • Evaluate their design using a focus group.	**Structures: Constructing a castle** This unit hub can be used to inform your medium-term plan and to navigate to related resources. **Unit outcomes** • Draw and label a simple castle that includes the most common features. • Recognise that a castle is made up of multiple 3D shapes. • Design a castle with key features which satisfy a given purpose. • Score or cut along lines on the net of a 2D shape. • Use glue to securely assemble geometric shapes. • Utilise skills to build a complex structure from simple geometric shapes. • Evaluate their work by answering simple questions.	**Cooking and nutrition: Eating seasonally** Learning about seasonal foods and using their understanding to create a seasonal food tart. **Unit outcomes** • Explain that fruits and vegetables grow in different countries based on their climates and identify which grow where. • Understand that seasonal fruits and vegetables grow in a given season and that eating them in season positively affects the environment. • Identify which foods grow in which season and find recipes that contain seasonal foods. • Know that importing food impacts the environment. • Identify the equipment used to prepare food and explain why food needs to be prepared safely. • Describe the taste of various fruits and vegetables and identify flavours. • Design a seasonal dish and describe the ingredients' nutritional benefits. • Evaluate the dishes and give and receive feedback to identify strengths.

	Key knowledge • 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.	**Key knowledge** • 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 facade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack.	**Key knowledge** • That seasonal means foods that grow in a given season in a given country. • Some seasonal foods that grow in the UK and what season they grow in. • That eating seasonal foods can have a positive impact on the environment. • How to describe the flavour and texture of foods. • How to cut and peel safely. • That the appearance of food is as important as taste. • That similar coloured fruits and vegetables often have similar nutritional benefits.
	Key skills • Problem solving by suggesting potential features on a micro:bit 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. • 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 an existing product. • Using feedback from peers to improve a design.	**Key skills** • Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes. • Designing and/or decorating a 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.	**Key skills** • Describing how climate affects where foods grow. • Identifying seasonal ingredients from the UK. • Tasting seasonal ingredients. • Describing the texture and flavour of ingredients. • Peeling foods by hand or with a peeler. • Cutting ingredients safely. • Choosing ingredients based on a design brief. • Following the instructions within a recipe. • Describing the benefits of seasonal fruits and vegetables and their impact on the environment.
	Key vocabulary • analogue • analyse • annotate • badge • computer-aided design (CAD) • control • design criteria • develop • digital • digital revolution • digital world • display • electronic • electronic products • fastening • feature • feedback • form • function • initiate • layers • monitor • net • opinion • point of sale • product • product design	**Key vocabulary** • 2D • 3D • castle • design • key features • net • scoring • shape • stable • stiff • strong • structure • tab	**Key vocabulary** • appearance • arid • climate • complementary • country • cut • design • evaluate • export • fruit • grate • import • ingredients • Mediterranean • mock-up • mountain • peel • polar • seasonal • seasons • snip • taste • temperate • texture • tropical • vegetable • weather
Year 4	**Structures: Helmets** Designing and making a helmet, using strengthening techniques to reinforce the shell structure.	**Mechanical cars** Making and designing mechanical cars that use different methods of movement.	**Electrical systems: Torches** Evaluating a range of existing torches and designing a functional torch for a target audience.

	Unit outcomes • Describe what a shell structure is and describe what makes an effective helmet. • Design a helmet for a specific user by choosing appropriate features. • Explain layering techniques used to strengthen a helmet. • Use layering techniques to make a helmet and reflect on the process. • Evaluate the strengthening required in the helmet and justify appropriate strengthening techniques. • Follow a design plan and use appropriate techniques to strengthen and stiffen the helmet. • Communicate with peers when making improvements. • Analyse helmets' strengths and weaknesses and evaluate how they work for their purpose.	**Unit outcomes** • Describe key design improvements in the history of the automobile. • Measure and compare the distance travelled by different mechanical cars. • Choose and use appropriate tools and materials to make mechanical cars. • Draw exploded diagrams and annotated sketches of my different mechanical cars. • Use a problem statement to identify the design criteria. • Assess the product against the design criteria. • Conduct market research into existing products. • Provide specific feedback and adjust my design to incorporate customer feedback.	**Unit outcomes** • Identify electrical products and explain why they are useful. • Help to make a working switch. • Identify the features of a torch and how it works. • Describe what makes a torch successful. • Create suitable designs that fit the success criteria and their own design criteria. • Create a functioning torch with a switch according to their design criteria.
	<u>Key knowledge</u> **Make** • Form is the look and shape of something. • Function is what something does and how it works. • Creating accurate shapes improves how they look and sometimes their function. **Evaluate** • Choices of materials and equipment can affect the final product. **Technical knowledge** • How some different structures are built. • Structures can be strengthened by manipulating materials and shapes. • A shell structure is a hollow shape with a thin outer layer.	**<u>Key knowledge</u>** **Design** • Extra information on drawings or diagrams can help the user understand a design or idea. • An exploded diagram shows how the parts of a product fit together. • A prototype is a detailed model that helps users understand how a product will work. • A problem or need is something that a designer can help to solve. • A target audience is a group of people that might like the idea. **Make** • Different tools and equipment have different dangers. • A ruler can be used to measure length. • Scissors are useful for cutting out complex shapes. • A hot glue gun can be used to join materials. • Different pieces of equipment will be used at different stages in a plan. **Evaluate** • The better the suggestions, the better the feedback. • They can choose to use feedback or not. • Some products are more successful than others because of their function. • Designers and inventors create products. • Choices of materials and equipment can affect the final product. • Feedback is ideas and suggestions from other people that can help improve their work. **Technical** • A mechanical system can allow us to move something more easily. • Mechanical systems have more than one mechanism that moves to make them work. • Mechanical systems are often hidden in products to make them look more appealing.	**<u>Key knowledge</u>** • Electrical conductors are materials which electricity can pass through. • Electrical insulators are materials which electricity cannot pass through. • A battery contains stored electricity that can be used to power products. • An electrical circuit must be complete for electricity to flow. • A switch can be used to complete and break an electrical circuit.
	<u>Key skills</u> **Design**	**Key skills** **Design**	**<u>Key skills</u>**

	• Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Noticing simple problems or needs in everyday life. • Developing drawing and sketching skills with a focus on clarity and simplicity. **Make** • Selecting materials, components or ingredients based on their form as well as their functional properties. • Explaining choices with regard to function and form. • Choosing shapes to suit the function of a product. **Evaluate** • Evaluating designs by comparing them against design criteria. Considering feedback from peers to suggest improvements. • Evaluating how effective the chosen materials were in fulfilling the design brief. **Technical knowledge** • Strengthening structures by layering materials (lamination). • Strengthening structures by ribbing.	• Taking part in structured idea generation sessions. • Developing drawing and sketching skills with a focus on clarity and simplicity. • Beginning to recognise the benefit of a range of diagram types or prototypes to communicate ideas. (e.g. sketches, cross-sectional diagrams, thumbnail sketches and exploded diagrams). • Creating prototypes using materials with similar properties to their final design. • Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Developing designs by adding details and justifications about materials, tools and methods. **Make** • Following detailed safety instructions. • Using a ruler as a measuring tool with increasing accuracy by creating spaced marks using millimetres and measuring lengths of objects. • Handle different sizes and types of scissors with confidence. • With close supervision, using a hot glue gun to join wooden materials (e.g. lolly sticks). • Selecting equipment required for a series of tasks based on the plan and explaining why each piece is suitable for each stage. **Evaluate** • Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements. • Reflecting on feedback to decide if and how it could be used to improve future iterations. • Investigating and analysing a range of existing products by looking at their functionality and appeal. • Analysing why specific products, designers or inventors are successful. • Evaluating their designs by comparing them against design criteria and considering feedback from peers to suggest improvements. • Evaluating how effective their chosen materials and tools were in fulfilling the design brief.	• 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.
	Key vocabulary • analyse • effective • iteration • reflect • strengthen	**Key vocabulary** • bearing • chassis • force • machine • mechanism • prototype • target audience	**Key vocabulary** • battery • bulb • buzzer • circuit diagram • component • conductor • electrical item • electricity • electronic item • insulator • series circuit • switch • target audience • test

			• torch • wire
Year 5	**<u>Electrical systems: Wobble bots</u>** Exploring the use of motors and designing and making a motorised product. **Unit outcomes** • Identify some simple elements of a circuit (battery, wires, bulb, motor and switch) and explain their function. • Explain that for electricity to flow around a circuit, it must be closed. • Describe a motor as an electrical circuit component that changes electricity into movement. • Provide examples of motorised products that use movement to rotate or spin different parts. • Make a product that uses a motor. • Design a motorised product for a particular purpose. • Determine appropriate design criteria based on the function of the proposed product. • Explain design choices based on the desired functionality of a product. • Create an innovative motorised product based on knowledge of existing products. • Discuss the effectiveness of a product while considering the design criteria.	**<u>Gears and pulleys</u>** Making and designing gear and pulley systems and exploring their uses. **Unit outcomes** • Give examples of machines that use gears and/or pulleys. • Describe how gears and pulleys work and their purpose. • Design and make a gear and pulley system. • Write a problem statement. • Write questions for market research, provide feedback and research market competitors. • Write and use a design brief to guide design. • Evaluate a product against a set of design criteria, provide useful feedback and incorporate changes. • Draw and annotate an eco-gadget bike design.	**<u>Cooking and nutrition: Developing a recipe</u>** Learning a simple bolognese recipe and adapting it to improve nutritional content. **Unit outcomes** • Describe the process of beef production. • Research a traditional recipe and make changes to it. • Add nutritional value to a recipe by selecting ingredients. • Prepare and cook a version of bolognese sauce.
	<u>Key knowledge</u> **Design** • Environmental impact is how the product and making the product might affect the environment. • Original and innovative ideas are different from what has been made before. • Annotations are detailed labels and comments on diagrams. • Materials and equipment lists help to plan better. • Improving on prototypes can help to improve the final design. **Make** • Research can help decide which materials are best for both aesthetics and functional properties. • Some equipment can work well with other equipment. • Risks are things that might go wrong. • The shape of an object can affect both its aesthetics and function. **Evaluate** • Sustainability means thinking about the materials that were used to make a product and how the product was made. • Looking at other designers' work can help inform designs. • Their final product can still be improved by using different materials or techniques. • Evaluating their designs in detail will help them understand their successful and less successful parts. • Feedback should be positive, helpful and specific. • That explaining how they used feedback to improve their design can help them create better products in the future. **Technical knowledge**	**<u>Key knowledge</u>** • Mechanical systems that use gears in everyday objects (e.g. bicycle, clock, etc.). • Gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another. • Gears allow us to increase the output of a mechanism. • Market research is a way of collecting information about problems or needs. • Constraints are things that might stop our ideas from being successful. • Original and innovative ideas are different from what has been made before. • Annotations are detailed labels and comments on diagrams. • Risks are things that might happen. • Hot glue creates a strong bond quickly. • It is often better to choose safer equipment. • Sustainability means thinking about the materials that were used to make a product and how the product was made. • Their final product can still be improved by different materials or techniques. • Evaluating their designs in detail will help them understand their successful and less successful parts. • Feedback should be positive, helpful and specific. • That explaining how they used feedback to improve their design can help them create better products in the future.	**<u>Key knowledge</u>** • That beef comes from cows reared on farms. • That recipes can be adapted to suit nutritional needs and dietary requirements. • That nutritional information is found on food packaging. • That coloured chopping boards can prevent cross-contamination. • That food packaging serves many purposes.

	• An electric motor converts electricity into rotational movement. • A motorised product is one which uses a motor to function. • The names of components that can form an electrical system.		
	<u>Key skills</u> **Design** • Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost. • Developing more independence in generating ideas. • Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about the practicality and originality of their ideas. • Using a series of prototypes to refine and improve their designs. **Make** • Producing lists of equipment, materials and tools that they need for a task. • Creating a step-by-step plan for making. • Selecting materials, components or ingredients based on research or user needs. • Explaining their choices, referring to their research. • Understanding and explaining the importance of each safety rule. • Applying safety instructions consistently. • Balancing aesthetics and functionality when creating parts of a design. • Considering when best to apply finishing effects. **Evaluate** • Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. • Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. • Considering alternative materials, tools or techniques that could enhance the product. • Providing feedback that is helpful, specific and encouraging. • Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had. **Technical knowledge** • Beginning to understand that electricity flows around a circuit. • Using different components to produce different results from electrical systems. • Creating working electrical circuits with a wider variety of electrical components. • Deconstructing electrical systems to understand how they work.	**<u>Key skills</u>** **Design** • Noticing wider-reaching problems or needs in the community. Identifying a wide range of needs and potential barriers through market research. • Writing more complex problem statements that consider multiple factors and constraints. • Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost. Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. • Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design. • Using a series of prototypes to refine and improve their designs. **Make** • Consistently apply safety instructions. • Select appropriate scissors to handle delicate cutting tasks and challenging materials. • Cutting patterns and drawings accurately. • In supervised groups, using hot glue guns safely. • Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly. • Choosing PVA glue over hot glue for its safety when joining materials in less intensive projects. **Evaluate** • Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. • Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. • Considering alternative materials, tools or techniques that could enhance the product. • Providing feedback that is helpful, specific, and encouraging. Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had.	**<u>Key skills</u>** • Explaining the farm-to-fork process. • Researching existing recipes. • Suggesting alternative ingredients. • Analysing nutritional content. • Writing an alternative recipe. • Understanding cross-contamination. • Using preparation skills. • Designing a jar label. • Making a developed recipe.
	<u>Key vocabulary</u> • annotate • assemble	**<u>Key vocabulary</u>** • annotate • axle	**<u>Key vocabulary</u>** • abattoir • adaptation

	• electrical component • motor • battery • circuit • electricity	• force • gear • gear system • input • machine • market research • mechanism • output • problem statement • pulley • pulley system • renewable energy • research • sustainability • teeth	• balanced • beef • brand • cook • cross-contamination • cut • design • enhance • equipment • evaluate • farm • grate • hygiene • ingredients • label • measure • nutrient • nutrition • nutritional value • preference • press • process • recipe • safety • theme
Year 6	**<u>Textiles: Bags</u>** Designing pattern pieces, making a bag for a specific user and thinking about aesthetics and functionality. **Unit Outcomes** Pupils who are secure will be able to: • Explore and compare real textile products, thinking about how they look, how they are used and how they affect the environment. • Develop and test design ideas by creating pattern pieces and making prototypes to explore how well they work. • Use labelled drawings and diagrams to show clear design ideas, including how pattern pieces will fit together. • Use fabrics and materials suitable for the product, thinking about how they look and how well they work. • Make 3D textile shapes by carefully cutting, folding and joining materials to match the design. • Join fabrics securely using stitches or knots and add decorative details to improve the appearance. • Use pins, scissors and other tools carefully to keep fabric flat and measure and cut accurately. • Evaluate how well the final product meets the design criteria and suggest improvements.	**<u>Structures: Playgrounds</u>** Designing a playground featuring a variety of different structures, considering how the structures will be used. **Unit outcomes** Pupils who are secure will be able to: • Create five apparatus designs, applying the design criteria to their work. • Make suitable changes to their work after peer evaluation. • Make roughly three different structures from their plans using the materials available. • Complete their structures, improving the quality of their rough versions and applying some cladding to a few areas. • Secure their apparatus to a base. • Make a range of landscape features using a variety of materials which will enhance their apparatus.	**<u>Digital world: Navigating the world</u>** Creating a digital product that meets a client's needs by coding clear features, building a 3D model with Tinkercad tools and explaining how and why their design works. **Unit outcomes** • Incorporate key information from a client's design request such as 'multifunctional' and 'compact' in their design brief. • Write a program that displays an arrow to indicate cardinal compass directions with an 'On start' loading screen. • Identify errors (bugs) in the code and suggest ways to fix (debug) them. • Self and peer evaluate a product concept against a list of design criteria with basic statements. • Identify key industries that use 3D CAD modelling and why. • Recall and describe the name and use of key tools used in Tinkercad (CAD) software. • Combine more than one object to develop a finished 3D CAD model in Tinkercad. • Complete a product pitch plan that includes key information.
	<u>Key Knowledge</u> **Design** • How designers use pattern pieces when creating textile products. • Pattern pieces are like nets/templates. **Make** • Nets can be folded to create 3D shapes.	**<u>Key Knowledge</u>** • 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.	**<u>Key knowledge</u>** • 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.

	• Products are sometimes made in parts that are sewn together. • Safety pins can hold fabric in place before sewing. **Evaluate** • Consistently sized stitches improve the aesthetic of a product. • The shape of an object can affect both its aesthetics and function. **Technical knowledge** • There are different types of stitches. • What a running stitch is. • Aesthetics is how something looks.		• To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.
	Key Skills **Design** • Developing annotated sketches to communicate design ideas. • Creating pattern pieces to use in design. **Make** • Using a ruler to accurately measure and draw lines and marks. • Using nets to create 3D objects. **Evaluate** • Reflecting on the functionality and aesthetics of products. • Discussing reasons for design choices. **Technical knowledge** • Using pins effectively to secure a template to fabric without creases or bulges. • Threading needles independently. • Tying knots at the end of thread to secure it. • Selecting textiles and buttons to improve aesthetics and function. • Attaching objects like buttons using thread.	**Key skills** • Designing a playground featuring a variety of different structures, giving 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.	**Key skills** • Writing a design brief from information submitted by a client. • Developing design criteria to fulfil the client's request. • Developing a product idea through annotated sketches. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combine 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. • 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.
	Key Vocabulary • innovative • pattern piece • seam allowance	**Key vocabulary** • apparatus • cladding • design criteria • equipment • landscape features • playground	**Key vocabulary** • application (apps) • biodegradable • boolean • cardinal compass • client • corrode • design brief • design criteria • duplicate • environmentally friendly • equipment • function • GPS tracker • if statement • lightweight • loop • mouldable • navigation • pedometer

			• product lifecycle • product lifespan • program • recyclable • replica • smart • smartphone • sustainable design • value • variable