Design and technology

Progression of skills and knowledge - Condensed

Subject leader overview EYFS - year 6

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Introduction

This document is to be used by those schools who are following our Condensed long-term plan.

It gives an overview of the **skills** and **knowledge** covered in each year group and strand and how these are developed through our Design and technology scheme of work.

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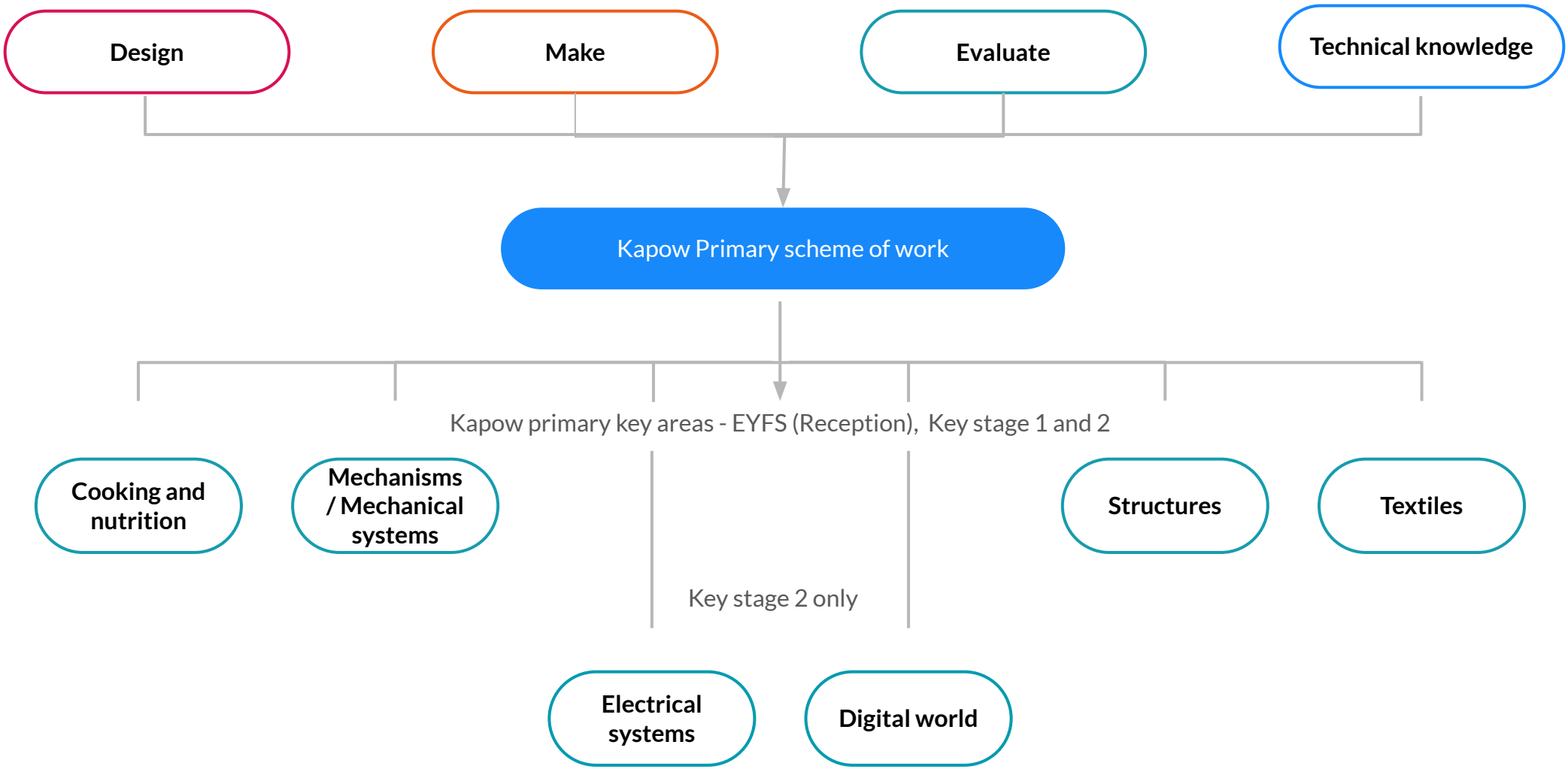
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If you are following our Standard Long-term plan, please use the accompanying: D&T Progression of skills and knowledge.

If you are following our Mixed-age Long-term plan, please use the accompanying: D&T Progression of skills and knowledge - Mixed-age version.

If you also subscribe to Art and are following our Art and DT Long-term plan, please use the accompanying: Art and DT Progression of skills and knowledge.

How is the Design and technology scheme of work organised?



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		EYFS (Reception)	
		Junk modelling	Boats
Skills	Design	• Making verbal plans and material choices. • Developing a junk model.	• Designing a junk model boat. • Using knowledge from exploration to inform design.
	Make	• Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together.	• Making a boat that floats and is waterproof, considering material choices.
	Evaluate	• Giving a verbal evaluation of their own and others' junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model.	• Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it moves.
Knowledge	Technical	• To know there are a range to different materials that can be used to make a model and that they are all slightly different. • Making simple suggestions to fix their junk model.	• To know that 'waterproof' materials are those which do not absorb water.
	Additional		• To know that some objects float and others sink. • To know the different parts of a boat.

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		Year 1	
		Option 1: Stable structures	Option 2: Constructing a windmill
Skills	Design	• Beginning to recognise how products and designs in the world around us solve certain needs. • 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.	• Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design.
	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) • Refining their grip to cut competently and confidently.	• Making stable structures from card. • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure. • Finding the middle of an object. • Puncturing holes. • Adding weight to structures. • Creating supporting structures. • Cutting evenly and carefully.
	Evaluate	• Saying what they like about their peers' designs and products. • Accepting feedback and understanding it is meant to improve their work.	
Knowledge	Technical	• Recognising that different structures are used for different purposes. • Exploring the features of structures. • Describing structures as buildings or freestanding structures. • Creating supporting structures to aid stability.	• To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). • To understand that axles are used in structures and mechanisms to make parts turn in a circle. • To begin to understand that different structures are used for different purposes. • To know that a structure is something that has been made and put together. • To know that the sails or blades of a windmill are moved by the wind. • To know that a structure is something built for a reason. • To know that stable structures do not topple. • To know that adding weight to the base of a structure can make it more stable.
	Additional	• To know that the purpose is what something is for. • To know that a plan is deciding what to do first and next. • To know that different equipment does different things. • To know the names of common pieces of equipment. • To know that some tools are sharp like scissors and knives. • To know that a structure is something that has been made and put together.	• To know that design criteria is a list of points to ensure the product meets the clients needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure. • To know that windmills are used to generate power and were used for grinding flour.

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		Year 2
		Baby bear's chair
Skills	Design	• Generating and communicating ideas using sketching and modelling.
	Make	• Making a structure according to design criteria. • Creating joints and structures from paper/card and tape. • Building a strong and stiff structure by folding paper.
	Evaluate	• Testing the strength of own structure. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of own structure.
Knowledge	Technical	• To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily.
	Additional	N/A

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		Year 3	Year 4
		Constructing a castle	Pavilions
Skills	Design	• Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. • Designing and/or decorating a castle tower on CAD software.	• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.
	Make	• Constructing a range of 3D geometric shapes using nets . • Creating special features for individual designs. • Making facades from a range of recycled materials.	• Creating a range of different shaped frame structures. • Making a variety of free standing frame structures of different shapes and sizes. • Selecting appropriate materials to build a strong structure and cladding. • Reinforcing corners to strengthen a structure. • Creating a design in accordance with a plan. • Learning to create different textural effects with materials.
	Evaluate	• 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.	• Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs.
Knowledge	Technical	• To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures.	• To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own.
	Additional	• To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack. • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. • To know that a design specification is a list of success criteria for a product.	• To know that a pavilion is a a decorative building or structure for leisure activities. • To know that cladding can be applied to structures for different effects. • To know that aesthetics are how a product looks. • To know that a product's function means its purpose. • To understand that the target audience means the person or group of people a product is designed for. • To know that architects consider light, shadow and patterns when designing.

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		Year 5	Year 6
		Bridges	Playgrounds
Skills	Design	• Designing a stable structure that is able to support weight. • Creating a frame structure with a focus on triangulation.	• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.
	Make	• Making a range of different shaped beam bridges. • Using triangles to create truss bridges that span a given distance and support a load. • Building a wooden bridge structure. • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks. • Using the correct techniques to saws safely. • Identifying where a structure needs reinforcement and using card corners for support. • Explaining why selecting appropriating materials is an important part of the design process. • Understanding basic wood functional properties.	• 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.
	Evaluate	• Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary. • Suggesting points for improvements for own bridges and those designed by others.	• 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.
Knowledge	Technical	• To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood.	• To know that structures can be strengthened by manipulating materials and shapes.
	Additional	• To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.	• 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.

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Year 1

Option 1: Matching slider game

Skills

Design

- Beginning to recognise how products and designs in the world around us solve certain needs.
- Considering who they are designing for – by identifying the user.
- Stating what they intend to make and why – by identifying the purpose.
- Talking about ideas with purpose and user in mind.
- Talking about existing products when generating ideas.
- Creating mock-ups to communicate designs.

Make

- Planning more than one step ahead.
- 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).
- Explaining in simple terms why certain tools must be handled carefully.
- Following and recalling simple safety instructions.
- 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 lines and evenly spaced lines.
- Puncturing holes.
- Applying masking tape to fix something in place or join to edges.
- Using tools, like scissors, to create shapes.

Evaluate

- Discussing existing products, saying what they like about them.
- Discussing how their products could be improved based on personal preferences.
- Saying what they like about their peers' designs and products.
- Accepting feedback and understanding it is meant to improve their work.

Knowledge

Technical

- Recognising and exploring everyday objects that have mechanisms.
- Recognising everyday objects that use a slider mechanism (eg. drawers, sliding doors, paper trimmer).

Additional

- To know that the 'user' is the person who will use the product.
- To know that designers usually design and make something to solve a problem.
- To know that who they are designing for makes a difference to what they design.
- To know that the purpose is what something is for.
- To know that a mock-up is a model of how something works.
- To know that different equipment does different things.
- To know the names of common pieces of equipment.
- To know that some tools are sharp like scissors and knives.
- To know that following instructions helps with safety.
- To know that cutting in a straight line can be helpful when making.
- To know that some products will be better than others.
- To know that their ideas or products can be made better.
- To know that many things that move have parts inside to help them work.
- To know that mechanisms usually limit unwanted movement.
- To know that a slider mechanism moves an object in a straight line (eg. left/right, up/down).
- To know that sliding mechanisms are designed to keep movement in one direction (eg. using guides/rails etc).

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		Year 1
		Option 2: Making a moving storybook
Skills	Design	• Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience.
	Make	• Following a design to create moving models that use levers and sliders.
	Evaluate	• Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed. • Reviewing the success of a product by testing it with its intended audience.
Knowledge	Technical	• To know that a mechanism is the parts of an object that move together. •To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots , guides and an object. • To know that bridges and guides are bits of card that purposefully restrict the movement of the slider.
	Additional	• To know that in Design and technology we call a plan a 'design'.

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		Year 1	
		New Option 1: Wheels and axles	
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 - by identifying the user.	• Stating what they intend to make and why - by 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	• Planning more than one step ahead. • 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 and glue for joining). • Explaining in simple terms why certain tools must be handled carefully. • Following and recalling simple safety instructions. •	• Finding the middle of an object. • Refining their grip to cut competently and confidently. • Cutting straight lines and evenly spaced lines. • Beginning to cut large shapes and thicker materials like card. • Puncturing holes. • Recognising the edges of paper and card need to be stuck firmly using a glue stick. • Using tools, like scissors, to create shapes. • Beginning to cut large shapes and thicker materials like card. • Beginning to use controlled painting or colouring techniques to finish a product. • Adding texture to create visual interest.
	Evaluate	• Discussing existing products, saying what they like about them. • Comparing two products and discussing which is better for a specific purpose. • Discussing how their products could be improved based on personal preferences.	• Comparing their finished products with their original designs. • Saying what they like about their peers' designs and products. • Accepting feedback and understanding it is meant to improve their work.
Knowledge	Technical	• Recognising and exploring everyday objects that have mechanisms. • Many things that move have parts inside to help them work.	• Mechanisms usually limit unwanted movement. • An axle allows the wheel to turn without falling off.
	Additional	• To know that the 'user' is the person who will use the product. • To know that different users may want different things from a design. • To know that designers usually design and make something to solve a problem. • To know that who they are designing for makes a difference to what they design. • To know that the purpose is what something is for. • To know that existing products can help when deciding what to design. • To know that drawings are a way to explain ideas. • To know that a plan is deciding what to do first and next. • To know that choosing different materials or components will have an effect on what their product does or looks like.	• • To know that different equipment does different things. • To know the names of common pieces of equipment. • To know that some tools are sharp like scissors and knives. • To know that following instructions helps with safety. • To know that cutting in a straight line can be helpful when making. • To know that tools can be used to shape objects. • To know that different materials can be shaped by different tools. • To know that some products will be better than others. • To know that their ideas or products can be made better. • To know that their final product might be different to their original idea. • To know that their ideas can make someone else's work better. • To know that other people's ideas can help make their work better.

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		Year 1
		Option 2: Wheels and axles
Skills	**Design**	• Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. • Creating clearly labelled drawings that illustrate movement.

	Make	• Adapting mechanisms, when:
		  • they do not work as they should.
		  • to fit their vehicle design.
		  • to improve how they work after testing their vehicle.

	Evaluate	• Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.
Knowledge	**Technical**	• To know that wheels need to be round to rotate and move. • To understand that for a wheel to move it must be attached to a rotating axle. • To know that an axle moves within an axle holder which is fixed to the vehicle or toy. • To know that the frame of a vehicle (chassis) needs to be balanced.
	Additional	• To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.

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		Year 2	
		Fairground wheel	Making a moving monster
Skills	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. • Using labels to explain parts of a design, label materials, etc. • Knowing that drawings can help explain how something works. • Knowing that a label explains part of a drawing.	• Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.
	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. • Knowing the names of some geometric shapes: triangle, pyramid, square, cube, circle, sphere. • Considering balance in their finishing, like evenly spaced decoration.	• 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.
	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.	• Evaluating own designs against design criteria. • Using peer feedback to modify a final design.
Knowledge	Technical	• To know everyday objects have mechanisms. • To know many things that move have parts inside to help them work. • To know mechanisms usually limit unwanted movement. • To know everyday objects utilise wheels and axles. • To know wheels must be able to turn to work effectively. • To know axles allow wheels to turn without falling off.	• To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers.
	Additional	• To know the features of a fairground wheel include the wheel, frame, pods, a base an axle and an axle holder.	• To know some real-life objects that contain mechanisms.

Year 3

Option 1: *New* Pneumatic toys

Skills	Design	• Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. • Taking part in structured idea blasting sessions. • Coming up with more ideas and considering the feasibility of their ideas in the classroom. • Developing drawing and sketching skills with a focus on clarity and simplicity. • Developing designs by adding detail and justifications about materials, tools, methods. • Beginning to recognise the benefit of a range of diagram types or prototypes to communicate ideas. (eg. sketches, cross-sectional diagram, thumbnail sketches and exploded diagrams).
	Make	• Selecting equipment required for a series of tasks based on the plan. Explain why each piece is suitable for each stage. • Suggesting simple safety rules based on their understanding of tool dangers. • Participating in discussions about classroom safety procedures. • Cutting out more complex shapes accurately. • Handle different sizes and types of scissors with confidence. • Using PVA glue to join corrugated card and light wood (e.g. balsa wood). • Choosing shapes to suit the function of a product. • Painting or colouring precisely to improve the finish. • Making facades from a range of materials. • Sealing edges with tape to cover gaps in joins.
	Evaluate	• 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. • 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.
Knowledge	Technical	• Beginning to understand how mechanisms work. • Recognising pneumatic systems in everyday objects (e.g. car boot, adjustable chair.)
	Additional	• To know that a problem or need is something that a designer can help to solve. • To know that extra information on drawings or diagrams can help the user understand a design or idea. • To know that thumbnail sketches are less detailed quick sketches. • To know that a cross-sectional diagram shows the inside of a product. • To know that an exploded diagram shows how the parts of a product fit together. • To know that different pieces of equipment will be used at different stages in a plan. • To know that different tools and equipment have different dangers. • To know that scissors are useful for cutting out complex shapes, • To know that designers and inventors create products. • To know that choices of materials and equipment can affect the final product. • To know that feedback is ideas and suggestions from other people that can help improve their work. • To know that they can choose to use feedback or not. • To understand that a mechanical system can allow us to move something more easily. • To know that mechanical systems have more than one mechanism that moves to make them work. • To know that mechanical systems are often hidden in products to make them look more appealing. • To know that pushing air can be used to move a mechanism. • To know that pivots can be used to create more movement in the mechanical system. • To know that a combination of mechanisms can improve a product.

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		Year 3	Year 4
		Option 2: Pneumatic toys	**Making a slingshot car**
Skills	**Design**	• Designing a toy which uses a pneumatic system. • Developing design criteria from a design brief. • Generating ideas using thumbnail sketches and exploded diagrams. • Learning that different types of drawings are used in design to explain ideas clearly.	• Designing a shape that reduces air resistance. • Drawing a net to create a structure from. • Choosing shapes that increase or decrease speed as a result of air resistance. • Personalising a design.
	Make	• Creating a pneumatic system to create a desired motion. • Building secure housing for a pneumatic system. • Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy. • Selecting materials due to their functional and aesthetic characteristics. • Manipulating materials to create different effects by cutting, creasing, folding and weaving.	• Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design.
	Evaluate	• Using the views of others to improve designs. • Testing and modifying the outcome, suggesting improvements. • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.	• Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.
Knowledge	**Technical**	• To understand how pneumatic systems work. • To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air.	• To know that air resistance is the level of drag on an object as it is forced through the air. • To understand that the shape of a moving object will affect how it moves due to air resistance..
	Additional	• To understand how sketches, drawings and diagrams can be used to communicate design ideas. • To know that exploded-diagrams are used to show how different parts of a product fit together. • To know that thumbnail sketches are small drawings to get ideas down on paper quickly.	• To know that aesthetics means how an object or product looks in design and technology. • To know that a template is a stencil you can use to help you draw the same shape accurately. • To know that a birds-eye view means a view from a high angle (as if a bird in flight). • To know that graphics are images which are designed to explain or advertise something. •To know that it is important to assess and evaluate design ideas and models against a list of design criteria.

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		Year 4
		New Mechanical cars
Skills	Design	• 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. (eg. sketches, cross-sectional diagram, 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 detail and justifications about materials, tools, 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. Explain why each piece is suitable for each stage. • Selecting materials, components or ingredients from a wider choice but within a limited design space (e.g. seasonal ingredients from May and June in the UK).
	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.
Knowledge	Technical	• To understand that a mechanical system can allow us to move something more easily. • To know that mechanical systems have more than one mechanism that moves to make them work. • To know that mechanical systems are often hidden in products to make them look more appealing.
	Additional	• To know that extra information on drawings or diagrams can help the user understand a design or idea. • To know that an exploded diagram shows how the parts of a product fit together. • To know that a prototype is a detailed model that helps a user understand how a product will work. • To know that a target audience is a group of people that might like the idea. • To know that different tools and equipment have different dangers. • To know that a ruler can be used to measure length. • To know that a hot glue gun can be used to join materials. • To know that better suggestions of improvements mean better feedback. • To know that they can choose to use feedback or not. • To know that some products are more successful than other because of their function. • To know that choices of materials and equipment can affect the final product. • To know that feedback is ideas and suggestions from other people that can help improve their work.

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		Year 5
		New Gears and pulleys
Skills	Design	● 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 improve their product further, explaining the changes they made and the impact they had.
Knowledge	Technical	● That mechanical systems that use gears in everyday objects (eg bicycle, clock). ● That gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another. ● That gears allow us to increase the output of a mechanism.
	Additional	● That original and innovative ideas are different from what has been made before. ● That annotations are detailed labels and comments on diagrams. ● That risks are things that might happen. ● That hot glue creates a strong bond quickly. ● That is often better to choose safer equipment. ● That sustainability means thinking about the materials that were used to make a product and how the product was made. ● That their final product can still be improved by different materials or techniques. ● That evaluating their designs in detail will help them understand its successful and less successful parts. ● That 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.

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		Year 5	Year 6
		Pop up book	Automata toys
Skills	Design	• Designing a pop-up book which uses a mixture of structures and mechanisms. • Naming each mechanism, input and output accurately. • Storyboarding ideas for a book.	• Noticing wider-reaching problems or needs in the community. • 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.
	Make	• Following a design brief to make a pop up book, neatly and with focus on accuracy. • Making mechanisms and/or structures using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.	• Producing lists of equipment, materials and tools that they need for a task. • Selecting materials, components or ingredients based on research or user needs. • Explaining their choices, referring to their research. • Considering which equipment will work well together. • Choosing from the known range of equipment available to them with little guidance. • Assessing risks associated with different tools and equipment. • Understanding and explaining the importance of each safety rule. • Consistently apply safety instructions. • Cutting jelutong or other harder wood with a coping saw or a tenon saw in small groups. • Cutting in a back-and-forth sawing motion where appropriate. • 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.
	Evaluate	N/A	• Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. • 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.
Knowledge	Technical	• To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms.	• To know that the mechanism in an automata uses a system of cams, axles and followers. • To know that different shaped cams produce different outputs. • To know which mechanisms are working together to make a mechanical system. • To know that there are different directions of movement. • To know that mechanisms can change one type of movement to another.
	Additional	• To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.	• To know that an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product.

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		Year 3	Year 4
			Torches
Skills	Design	N/A: **The Condensed Long-term plan does not include an Electrical systems unit for Year 3**	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.
	Make		• 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.
	Evaluate		• Evaluating electrical products. • Testing and evaluating the success of a final product.
Knowledge	Technical		• To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit.
	Additional		• To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.

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		Year 5	Year 6
		Doodlers	Steady hand game
Skills	Design	• Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. • Developing design criteria based on findings from investigating existing products. • Developing design criteria that clarifies the target user.	• Designing a steady hand game - identifying and naming the components required. • Drawing a design from three different perspectives. • Generating ideas through sketching and discussion. • Modelling ideas through prototypes.
	Make	• Altering a product's form and function by tinkering with its configuration. • Making a functional series circuit, incorporating a motor. • Constructing a product with consideration for the design criteria.	• Constructing a stable base for a game. • Accurately cutting, folding and assembling a net. • Decorating the base of the game to a high quality finish. • Making and testing a circuit. • Incorporating a circuit into a base.
	Evaluate	• Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. • Determining which parts of a product affect its function and which parts affect its form. • Analysing whether changes in configuration positively or negatively affect an existing product.	• Testing own and others finished games, identifying what went well and making suggestions for improvement.
Knowledge	Technical	• To know that series circuits only have one direction for the electricity to flow. • To know when there is a break in a series circuit, all components turn off. • To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. • To know a motorised product is one which uses a motor to function.	• To know that batteries contain acid, which can be dangerous if they leak. • To know the names of the components in a basic series circuit, including a buzzer.
	Additional	• To know that product analysis is critiquing the strengths and weaknesses of a product. • To know that 'configuration' means how the parts of a product are arranged.	• To understand the diagram perspectives 'top view', 'side view' and 'back'.

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		Year 1	Year 2
		Smoothies	Balanced diet
Skills	Design	• Designing smoothie carton packaging by-hand. • Learning where and how fruits and vegetables grow.	• Designing three wrap ideas.
	Make	• Chopping fruit and vegetables safely to make a smoothie. • Juicing fruits safely to make a smoothie. • Identifying if a food is a fruit.	• Chopping foods safely to make a wrap. • Constructing a wrap that meets a design brief. • Grating foods to make a wrap. • Snipping smaller foods instead of cutting. • Spreading soft foods to make a wrap. • Identifying the five food groups. • Learning about balanced diet.
	Evaluate	• Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. • Comparing their own smoothie with someone else's.	• Describing appearance, smell and taste. • Taste and evaluating different food combinations. • Describing the information that should be included on a label.
Knowledge		• To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and a vegetable does not. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables is any edible part of a plant.	• To know that 'diet' means the food and drink that a person or animal usually eats. • To know what makes a balanced diet. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To know that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that 'ingredients' means the items in a mixture or recipe. • To know how to cut, grate, snip and spread to prepare foods. • To know how to review and give a score to evaluate.

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		Year 3	Year 4
		Eating seasonally	Adapting a recipe
Skills	Design	• Describing how climate affects where foods grow.	• Designing a biscuit within a given budget. • Conducting market research.
	Make	•Identifying seasonal ingredients from the UK. •Following the instructions within a recipe. • Tasting seasonal ingredients. • Peeling foods by hand or with a peeler. • Cutting ingredients safely. • Choosing ingredients based on a design brief.	• Following a baking recipe. • Understanding safety and hygiene rules. • Adapting a recipe.
	Evaluate	• Describing the texture and flavour of ingredients. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment.	• Evaluating an adapted recipe. • Evaluating and comparing a range of products. • Suggesting modifications.
Knowledge		• To know that seasonal means foods that grow in a given season in a given country. • To know some seasonal foods that grow in the UK and what season they grow in. • To know that eating seasonal foods can have a positive impact on the environment. • To know how to describe the flavour and texture of foods. • To know how to cut a peel safely. • To know that the appearance of food is as important as taste. • To know that similar coloured fruits and vegetables often have similar nutritional benefits.	• To know that the amount of an ingredient in a recipe is known as the 'quantity.' • To know that safety and hygiene are important when cooking. • To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping. •To know the importance of budgeting while planning ingredients for a recipe. • To know that products often have a target audience.

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		Year 5	Year 6
		Developing a recipe	Come dine with me
Skills	Design	• Researching existing recipes. • Suggesting alternative ingredients. • Designing a jar label.	• Writing a recipe, explaining the key steps, method and ingredients. • Including facts and drawings from research undertaken.
	Make	• Writing an alternative recipe. • Understanding cross-contamination. • Using preparation skills. • Making a developed recipe.	• Following a recipe, including using the correct quantities of each ingredient. • Adapting a recipe based on research. • Working to a given timescale. • Working safely and hygienically with independence.
	Evaluate	• Explaining the farm to fork process. • Analysing nutritional content.	• Evaluating a recipe, considering: taste, smell, texture and origin of the food group. • Taste testing and scoring final products. • Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. • Evaluating health and safety in production to minimise cross contamination.
Knowledge		• To know that beef comes from cows reared on farms. • To know that recipes can be adapted to suit nutritional needs and dietary requirements. • To know that nutritional information is found on food packaging. • To know that coloured chopping boards can prevent cross-contamination. • To know that food packaging serves many purposes.	• To know that 'flavour' is how a food or drink tastes. • To know that many countries have 'national dishes' which are recipes associated with that country. • To know that 'processed food' means food that has been put through multiple changes in a factory. • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).

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		EYFS: Reception	Year 1	Year 2
		Bookmarks	Puppets	Pouches
Skills	Design	• Discussing what a good design needs. • Designing a simple pattern with paper. • Designing a bookmark. • Choosing from available materials.	• Using a template to create a design for a puppet.	• Designing a pouch.
	Make	• Developing fine motor/cutting skills with scissors. • Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. • Using a prepared needle and wool to practise threading.	• Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction.	• Selecting and cutting fabrics for sewing. • Decorating a pouch using fabric glue or running stitch. • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template.
	Evaluate	• Reflecting on a finished product and comparing to their design.	• Reflecting on a finished product, explaining likes and dislikes.	• Troubleshooting scenarios posed by teacher. • Evaluating the quality of the stitching on others' work. • Discussing as a class, the success of their stitching against the success criteria. • Identifying aspects of their peers' work that they particularly like and why.
Knowledge		• To know that a design is a way of planning our idea before we start. • To know that threading is putting one material through an object.	• To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples. glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look.	• To know that sewing is a method of joining fabric. • To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing.

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		Year 3	Year 4
		Cross-stitch and appliqué Cushions or Egyptian collars	Fastenings
Skills	Design	• Designing and making a template from an existing cushion and applying individual design criteria.	• Writing design criteria for a product, articulating decisions made. • Designing a personalised book sleeve.
	Make	• Following design criteria to create a cushion or Egyptian collar. • Selecting and cutting fabrics with ease using fabric scissors. • Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch to join fabric. • Decorating fabric using appliqué. • Completing design ideas with stuffing and sewing the edges (Cushions) ***or*** embellishing the collars based on design ideas (Egyptian collars).	• Making and testing a paper template with accuracy and in keeping with the design criteria. • Measuring, marking and cutting fabric using a paper template. • Selecting a stitch style to join fabric, working neatly by sewing small, straight stitches. • Incorporating fastening to a design.
	Evaluate	• Evaluating an end product and thinking of other ways in which to create similar items.	• Testing and evaluating an end product against the original design criteria. • Deciding how many of the criteria should be met for the product to be considered successful. • Suggesting modifications for improvement. • Articulating the advantages and disadvantages of different fastening types.
Knowledge		•To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. •To know that when two edges of fabric have been joined together it is called a seam. •To know that it is important to leave space on the fabric for the seam. •To understand that some products are turned inside out after sewing so the stitching is hidden.	• To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro. • To know that different fastening types are useful for different purposes. • To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.

Year 5	Year 6
N/A: The Condensed Long-term plan does not include a Textiles unit for Year 5	**N/A: The Condensed Long-term plan does not include a Textiles unit for Year 6**

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		Year 3	Year 4
		Wearable technology	Mindful moments timer
Skills	Design	• Problem solving by suggesting which features on a micro:bit might be useful and justifying my ideas. • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge. • Developing design ideas through annotated sketches to create a product concept. • Developing design criteria to respond to a design brief.	N/A: **The condensed Long term plan does not include a Digital World unit for Year 4**
	Make	• 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.	
	Evaluate		
Knowledge	Technical	• 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.	
	Additional	• To understand what is meant by 'point of sale display.' • To know that CAD stands for 'Computer-aided design'.	

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		Year 5	Year 6
		Monitoring devices	Navigating the world
Skills	Design	• Researching (books, internet) for a particular (user's) animal's needs. • Developing design criteria based on research. • Generating multiple housing ideas using building bricks. • Understanding what a virtual model is and the pros and cons of traditional and CAD modelling. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD.	• Writing a design brief from information submitted by a client. • Developing design criteria to fulfil the client's request. • Considering and suggesting additional functions for my navigation tool. • Developing a product idea through annotated sketches. • Placing and manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD.
	Make	• Understanding the functional and aesthetic properties of plastics. • Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range.	• 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.
	Evaluate	• Stating an event or fact from the last 100 years of plastic history. • Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices. • Explaining key functions in my program (audible alert, visuals). • Explaining how my product would be useful for an animal carer including programmed features.	• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Developing an awareness of sustainable design. • Identifying key industries that utilise 3D CAD modelling and explaining why. • Describing how the product concept fits the client's request and how it will benefit the customers. • Explaining the key functions in my program, including any additions. • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool. • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch. • Demonstrating a functional program as part of a product concept pitch.
Knowledge	Technical	• To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record. • To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. • To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.	• 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.
	Additional	• To understand key developments in thermometer history. • To know events or facts that took place over the last 100 years in the history of plastic, and how this is changing our outlook on the future. • To know the 6Rs of sustainability. • To understand what a virtual model is and the pros and cons of traditional vs CAD modelling.	• To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request. • To know that 'multifunctional' means an object or product has more than one function. • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.

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Version history

This page shows recent updates to the documents.

Date	Update
18.11.22	EYFS condensed curriculum units added.
21.03.23	Changed key area title from 'Food' to 'Cooking and nutrition' and removed 'Cooking and nutrition as a strand.
30.08.23	Updated to reflect changes to the Long-term plan — condensed version, replacing the Y3 Digital world unit with 'Wearable technology' (p. 18).
10.11.23	Updated to reflect refreshed Cooking and nutrition units and changes to the condensed Long-term plan as a result (p. 13-15).
14.11.23	Further updates to Cooking and nutrition 'Technical knowledge' statements.
30.04.24	Updated to reflect refreshed 'Constructing a windmill unit.' (p.5).
21.08.24	Updated to reflect refreshed content published on the website.
02.09.24	Updated to add links to new units.
18.10.24	Updated to reflect refreshed content published on the website.
18.12.24	Updated to reflect refreshed content published on the website.
06.03.25	Updated Cooking and nutrition statements to reflect those on the website.
22.05.25	Updated to reflect new content published on the website.

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