

Progression in Design & Technology

All years

Children should be taught	Progression in knowledge, skills and understanding by the end of the phase, children will be able to		
To design	Year 2	Year 4	Year 6
(Structures)	• Learn the importance of a clear design criteria including individual preferences and requirements in a design. • Generate and communicating ideas using sketching and modelling. • Learn about different types of structures, found in the natural world and in everyday objects	• Design a structure that is aesthetically pleasing and select materials to create a desired effect. • Build frame structures designed to support weight.	• Design a stable structure that is able to support weight. • Create 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.
To make (Structures)	• Make stable structures from card. • Follow instructions to cut and assemble a supporting structure. • Make functioning turbines and axles which are assembled into a main supporting structure. • Find the middle of an object. • Puncture holes. • Add weight to structures. • Create supporting structures. • Cut evenly and carefully. • Making a structure according to design criteria. • Creating joints and structures from paper/card and tape. • Build a strong and stiff structure by folding paper.	• Construct a range of 3D geometric shapes using nets. • Create special features for individual designs. • Create a range of different shaped frame structures. • Make a variety of free-standing frame structures of different shapes and sizes. • Select appropriate materials to build a strong structure and cladding. • Reinforce corners to strengthen a structure. • Create a design in accordance with a plan. • Learn to create different textural effects with materials.	• Select appropriate tools and equipment for particular tasks. • Use the correct techniques to saws safely. • Build a range of play apparatus structures drawing upon new and prior knowledge of structures. • Measure, mark and cut wood to create a range of structures. • Use a range of materials to reinforce and add decoration to structures.

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To evaluate	Year 2	Year 4	Year 6
(Structures)	• Explore the features of structures. • Compare the stability of different shapes. • Test the strength of own structures. • Identify the weakest part of a structure. • Evaluate the strength, stiffness and stability of own structure, suggesting points for improvement.	• Evaluate structures made by the class. • Suggest points for modification of the individual designs. • Describe what characteristics of a design and construction made it the most effective. • Consider effective and ineffective designs	• Improve a design plan based on peer evaluation. • Test and adapt a design to improve it as it is developed. • Identify what makes a successful structure.
Technical knowledge about structure	• Know that shapes and structures with wide, flat bases or legs are the most stable. • Understand that the shape of a structure affects its strength. • Know that materials can be manipulated to improve strength and stiffness. • Know that a structure is something which has been formed or made from parts. • Know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • Know that a 'strong' structure is one which does not break easily. • Know that a 'stiff' structure or material is one which does not bend easily	• Understand that wide and flat based objects are more stable. • Understand the importance of strength and stiffness in structures. • Understand what a frame structure is. • Know that a 'free-standing' structure is one which can stand on its own.	• Know that properties are words that describe the form and function of materials. • Understand why material selection is important based on properties. • Understand the material (functional and aesthetic) properties of wood. • Know that structures can be strengthened by manipulating materials and shapes.

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Additional knowledge about structures	Year 2	Year 4	Year 6
	• To know that design criteria is a list of points to ensure the product meets the client's 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 and that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure. • To know that windmills are used to generate power and were used for grinding flour. • To know that natural structures are those found in nature and that man-made structures are those made by people.	• To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To understand that a castle needed to be strong and stable to withstand enemy attack • To know that a façade is the front of a structure. • 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 decorative building or structure for leisure activities. • To know that aesthetics are how a product looks and 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.	• 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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To design	Year 2	Year 4	Year 6
(Mechanisms & Mechanical Systems)	• Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience. • 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. • Selecting a suitable linkage system to produce the desired motion. • Designing a wheel. • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria	• Develop design criteria from a design brief. • Generate ideas using thumbnail sketches and exploded diagrams. • Learn that different types of drawings are used in design to explain ideas clearly. • Design a shape that reduces air resistance. • Draw a net to create a structure from. • Choose shapes that increase or decrease speed as a result of air resistance. • Personalise a design.	• Design a pop-up book which uses a mixture of structures and mechanisms. • Name each mechanism, input and output accurately. • Storyboard ideas for a book. • Experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. • Understand how linkages change the direction of a force. • Making things move at the same time. • Understand and drawing cross-sectional diagrams to show the inner workings of a design.

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To make	Year 2	Year 4	Year 6
(Mechanisms & Mechanical Systems)	- Follow a design to create moving models that use levers and sliders. - Adapt mechanisms, when they do not work as they should and to fit their vehicle design. - Select materials according to their characteristics. - Follow a design brief. - Make linkages using card for levers and split pins for pivots. - Experiment with linkages adjusting the widths, lengths and thicknesses of card used. - Cut and assemble components neatly.	- Create a pneumatic system to create a desired motion. - Build secure housing for a pneumatic system. - Use syringes and balloons to create different types of pneumatic systems - Select materials due to their functional and aesthetic characteristics. - Manipulate materials to create different effects by cutting, creasing, folding and weaving. - Measure, mark, cut and assemble with increasing accuracy. - Make a model based on a chosen design.	- Make mechanisms and/or structures using sliders, pivots and folds to produce movement. - Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. - Measure, mark and check the accuracy of the jelutong and dowel pieces required. - Measure, mark and cut components accurately using a ruler and scissors. - Assemble components accurately to make a stable frame. - Understand that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. - Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.

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To evaluate	Year 2	Year 4	Year 6
(Mechanisms & Mechanical Systems)	• Evaluate different designs. • Test and adapt a design. • Evaluate own designs against design criteria. • Use peer feedback to modify a final design.	• Use the views of others to improve designs. • Test and modify the outcome, suggesting improvements. • Understand the purpose of exploded-diagrams through the eyes of a designer and their client. • Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.	• Suggest points for improvement. • Evaluate the work of others and receive feedback on own work. • Apply points of improvement to their projects. • Describe changes they would make/do if they were to do the project again.
Technical Knowledge about Mechanisms/ Mechanical Systems	• To know that different materials have different properties and are therefore suitable for different uses. • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know how wheels and axles work. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers.	• To 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 understand that all moving things have kinetic energy. • To understand that kinetic energy is the energy that something (object/person) has by being in motion. • To know that air resistance is the level of drag on an object as it is forced through the air. • To understand that the shape of a moving object will affect how it moves due to air resistance.	• To 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 understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs.

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Additional knowledge about Mechanisms/ Mechanical Systems	Year 2	Year 4	Year 6
	• To know that in Design and technology we call a plan a 'design'. • To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles. • To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur. • To know some real-life objects that contain mechanisms.	• 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 understand that products change and evolve over time. • To know that aesthetics means how an object or product looks in design and technology. • To know that a template is a stencil you can use to help you draw the same shape accurately. • To know that a birds-eye view means a view from a high angle (as if a bird in flight). • To know that graphics are images which are designed to explain or advertise something. • To know that it is important to assess and evaluate design ideas and models against a list of design criteria.	• 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 understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs.

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To design (Cooking & Food Nutrition)	Year 2	Year 4	Year 6
	• Design smoothie carton packaging by-hand. • Designing three wrap ideas based on a food combination which work well together.	• Design a recipe for a savoury tart. • Design a biscuit within a given budget, drawing upon previous taste testing judgements. Designing packaging for a biscuit that targets a specific group.	• Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. • Write an amended method for a recipe to incorporate the relevant changes to ingredients. • Design appealing packaging to reflect a recipe. • Research existing recipes to inform ingredient choices. • Write a recipe, explaining the key steps, method and ingredients. Include facts and drawings from research undertaken.

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To make (Cooking & Food Nutrition)	Year 2	Year 4	Year 6
	• Chop fruit and vegetables safely to make a smoothie. • Juice fruits safely. • Construct a wrap that meets a design brief. • Grate foods • Snip smaller foods instead of cutting	• Follow the instructions within a recipe. • Taste and select seasonal ingredients • Peel ingredients safely. • Cut safely with a vegetable knife. • Follow a baking recipe, including the preparation of ingredients. • Cook safely, following basic hygiene rules. • Adapt a recipe to meet the requirements of a target audience. • Using a cuboid net to create packaging.	• Cut and prepare vegetables safely. • Use equipment safely, including knives, hot pans and hobs. • Know how to avoid cross-contamination. • Following a step-by-step method carefully to make a recipe. • Follow a recipe, including using the correct quantities of each ingredient. Adapt a recipe based on research. • Work to a given timescale. • Work safely and hygienically with independence.

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To evaluate (Cooking & Food Nutrition)	Year 2	Year 4	Year 6
	- Describe the taste, texture and smell of fruit, vegetables and other foods. - Taste test food combinations and final products. - Describing the information that should be included on a label or packaging. - Evaluate food by giving a score.	- Establishing and using design criteria to help test and review dishes. - Describe the benefits of seasonal fruits and vegetables and the impact on the environment. - Suggest points for improvement when making a seasonal tart. - Evaluate a recipe, considering: taste, smell, texture and appearance. - Describe the impact of the budget on the selection of ingredients. - Evaluate and compare a range of food products. - Suggest modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use fewer raisins).	- Identify the nutritional differences between different products and recipes. - Identify and describe healthy benefits of food groups. - Evaluate a recipe, considering: taste, smell, texture and origin of the food group. - Taste test and score final products. - Suggest and write up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process. - Evaluate health and safety in production to minimise cross contamination.

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Knowledge about Cooking & Food Nutrition	Year 2	Year 4	Year 6
	• To know that 'diet' means the food and drink that a person or animal usually eats. • To understand what makes a balanced diet. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that they 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 that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground and that a vegetable is any edible part of a plant.	• To know that not all fruits and vegetables can be grown in the UK and that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food which has been brought into the country and that exported food is food which has been sent to another country.. • To know that eating seasonal foods can have a positive impact on the environment. • To know that similar coloured fruits and vegetables often have similar nutritional benefits. • To know that the appearance of food is as important as taste. • To know that the amount of an ingredient in a recipe is known as the 'quantity.' • To know that the amount of an ingredient in a recipe is known as the 'quantity.' • To know that safety and hygiene are important when cooking. • To know the following cooking techniques: sieving, measuring, stirring, cutting out and shaping. • To understand the importance of budgeting while planning ingredients for biscuits. • To know that products often have a target audience.	• To understand where meat comes from and how it is reared and processed. • To know that recipes can be adapted to suit nutritional needs and dietary requirements. • To know that I can use a nutritional calculator to see how healthy a food option is. • To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects. • To know that coloured chopping boards can prevent cross-contamination. • To know that nutritional information is found on food packaging. • To know that food packaging serves many purposes. • 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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To design (Textiles)	Year 2	Year 4	Year 6
	• Use a template to create a design for a puppet. • Design a pouch.	• Design and making a template from an existing cushion and apply individual design criteria. • Write design criteria for a product, articulating decisions made. • Design a personalised book sleeve.	• Design a stuffed toy, considering the main component shapes required and create an appropriate template. • Consider the proportions of individual components. • Design a waistcoat in accordance to a specification linked to set of design criteria. • Annotate designs, to explain their decisions.

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All years

Children should be taught	Progression in knowledge, skills and understanding by the end of the phase, children will be able to		
To make	Year 2	Year 4	Year 6
(Textiles)	• Select and cut fabrics for sewing. • Decorate a pouch using fabric glue or running stitch. • Thread a needle. • Sew running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template.	• Following design criteria to create a cushion. • Select and cut fabrics with ease using fabric scissors. • Thread needles with greater independence. • Tie knots with greater independence. • Sew cross stitch to join fabric. • Decorate fabric using appliqué. • Complete design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars). • Mak and test a paper template with accuracy and in keeping with the design criteria. • Measure, mark and cut fabric using a paper template. • Select a stitch style to join fabric. • Work neatly by sewing small, straight stitches. • Incorporate a fastening to a design	• Create a 3D stuffed toy from a 2D design. • Create strong and secure blanket stitches when joining fabric. • Thread needles independently. • Use a template when cutting fabric to ensure they achieve the correct shape. • Use pins effectively to secure a template to fabric without creases or bulges. • Mark and cut fabric accurately, in accordance with their design. • Sew a strong running stitch, making small, neat stitches and following the edge. • Tie strong knots. • Decorate a waistcoat, attaching features (such as appliqué) using thread. • Finish the waistcoat with a secure fastening (such as buttons). • Learn different decorative stitches. • Sew accurately with evenly spaced, neat stitches.

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To evaluate (Textiles)	Year 2	Year 4	Year 6
	• Reflect on a finished product, explaining likes and dislikes. • Troubleshoot scenarios posed by teacher. • Evaluate the quality of the stitching on others' work. • Discuss as a class, the success of their stitching against the success criteria. • Identify aspects of their peers' work that they particularly like and why.	• Think of other ways in which to create similar items. • Test and evaluate an end product against the original design criteria. • Decide how many of the criteria should be met for the product to be considered successful. • Suggest modifications for improvement. • Articulate the advantages and disadvantages of different fastening types.	• Test and evaluate an end product and give points for further improvements. • Reflect on their work continually throughout the design, make and evaluate process.

Progression in Design & Technology

All years

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Technical knowledge about Textiles	Year 2	Year 4	Year 6
	• To know that 'joining technique' means connecting two pieces of material together and that sewing is a method of joining fabric. • 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 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.	• 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.	• To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. • To understand that it is easier to finish simpler designs to a high standard. • To know that soft toys are often made by creating appendages separately and then attaching them to the main body. • To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely. • To understand that it is important to design clothing with the client/ target customer in mind. • To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches.

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To design	Year 2	Year 4	Year 6
(Electrical Systems, KS2 only)		• Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas. • Generate a final design for the electric poster with consideration to the client's needs and design criteria. • Design an electric poster that fits the requirements of a given brief. • Plan the positioning of the bulb (circuit component) and its purpose. • Design a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	• Identify factors that could be changed on existing products and explaining how these would alter the form and function of the product. • Develop design criteria based on findings from investigating existing products. • Develop design criteria that clarifies the target user. • Design a steady hand game - identifying and naming the components required. • Draw a design from three different perspectives. • Generate ideas through sketching and discussion. • Model ideas through prototypes. • Understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.

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To make (Electrical Systems, KS2 only)	Year 2	Year 4	Year 6
		• Create a final design for the electric poster. • Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear. • Measure and mark materials out using a template or ruler. • Fit an electrical component (bulb). • Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge). • Make a torch with a working electrical circuit and switch. • Use appropriate equipment to cut and attach materials. • Assemble a torch according to the design and success criteria.	• Alter a product's form and function by tinkering with its configuration. • Make a functional series circuit, incorporating a motor. • Construct a product with consideration for the design criteria. • Break down the construction process into steps so that others can make • Construct a stable base for a game. • Accurate cut, fold and assemble a net. • Decorate the base of the game to a high-quality finish. • Make and test a circuit. Incorporate a circuit into a base.

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To evaluate	Year 2	Year 4	Year 6
(Electrical Systems, KS2 only)		• Learn to give and accept constructive criticism on own work and the work of others. • Test the success of initial ideas against the design criteria and justifying opinions. • Revisit the requirements of the client to review developing design ideas and check that they fulfil their needs. • Evaluate electrical products. • Test and evaluate the success of a final product.	• Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. • Determine which parts of a product affect its function and which parts affect its form. • Analyse whether changes in configuration positively or negatively affect an existing product. • Peer-evaluate a set of instructions to build a product. • Test own and others finished games, identifying what went well and making suggestions for improvement. • Gather images and information about existing children's toys. • Analyse a selection of existing children's toys.

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Technical knowledge about Electrical Systems (KS2 only)	Year 2	Year 4	Year 6
		• 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.	• To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. • To understand common features of an electric product (switch, battery or plug, dials, buttons etc.). • To list examples of common electric products (kettle, remote control etc.). • To understand that an electric product uses an electrical system to work (function). • To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits. • To understand that electrical conductors are materials which electricity can pass through and that electrical insulators are materials which electricity cannot pass through. • To know that a battery contains stored electricity that can be used to power products. • To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit.

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To design	Year 2	Year 4	Year 6
(Digital World)		• Problem solve by suggesting which features on a Micro:bit might be useful and justifying my ideas. • Draw and manipulate 2D shapes, using computer-aided design, to produce a point of sale badge. • Develop design ideas through annotated sketches to create a product concept. • Develop design criteria to respond to a design brief. • Write design criteria for a programmed timer (Micro:bit). • Apply the results of research to further inform design criteria. • Develop a prototype case for my <i>mindful moment timer</i>. • Use and manipulate shapes and clipart by using computer-aided design (CAD), to produce a logo. • Follow a list of design requirements.	• Research (books, internet) for a particular user's needs. • Develop design criteria based on research. • Generate multiple housing ideas using building bricks. • Understand what a virtual model is and the pros and cons of traditional and CAD modelling. • Write a design brief from information submitted by a client; develop design criteria to fulfil the client's request. • Consider and suggest additional functions for <i>navigation tool</i>. • Develop a product idea through annotated sketches. • Place and manoeuvring 3D objects, using CAD. • Change the properties of, or combining one or more 3D objects, using CAD.

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To make (Digital World)	Year 2	Year 4	Year 6
		- Following a list of design requirements. - Write a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm. - Develop a prototype case for <i>mindful moment timer</i>. - Create 3D structures using modelling materials. - Programme a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.	- Understand the functional and aesthetic properties of plastics. - Programme to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range. - Consider materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). - Explain material choices and why they were chosen as part of a product concept. - Programme a N,E, S, W cardinal compass.

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To evaluate (Digital World)	Year 2	Year 4	Year 6
		- Analyse and evaluate wearable technology. - Use feedback from peers to improve design. - Investigate and analyse a range of timers by identifying and comparing their advantages and disadvantages. - Evaluate my Micro:bit program against points on my design criteria and amend them to include any changes I made. - Document and evaluate my project - Understand what a logo is and why they are important in the world of design and business. - Test my program for bugs (errors in the code). - Find and fix the bugs (debug) in my code. - Use an exhibition to gather feedback. - Gather feedback from the user to make suggested improvements to a product.	- State an event or fact from the last 100 years of plastic history. - Explain how plastic is affecting planet Earth and suggesting ways to make more sustainable choices. - Explain how my product would be useful for the client (an animal carer) including programmed features. - Develop an awareness of sustainable design. - Identify key industries that utilise 3D CAD modelling and explaining why. - Describe how the product concept fits the client's request and how it will benefit the customers. - Explain the key functions in my program, including any additions. - Explain how my program fits the design criteria and how it would be useful as part of a navigation tool. - Explain the key functions and features of my navigation tool to the client as part of a product concept pitch. - Demonstrate a functional program as part of a product concept pitch.

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Children should be taught	Progression in knowledge, skills and understanding by the end of the phase, children will be able to		
Technical Knowledge about Digital World (KS2 only)	Year 2	Year 4	Year 6
		• 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, codable computer. • To know that a simulator is able to replicate the functions of an existing piece of technology. • To understand what variables are in programming. • To know some of the features of a Micro:bit. • To know that an algorithm is a set of instructions to be followed by the computer. • To know that it is important to check my code for errors (bugs). • To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device.	• 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.

Progression in Design & Technology

All years

Children should be taught	Progression in knowledge, skills and understanding by the end of the phase, children will be able to		
Additional knowledge about Digital World (KS2 only)	Year 2	Year 4	Year 6
		• 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. • To understand the terms 'ergonomic' and 'aesthetic'. • To know that a prototype is a 3D model made out of cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials. • To know that an exhibition is a way for companies to showcase products, meet potential new customers and gather feedback from users.	• 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.