Mechanical Systems		Making a moving monster (Year A)		Pneumatic Toys (Year A)		Automata toy (Year B)	
		Year 1	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 6***
Skills	**Design**	Explaining how to adapt mechanisms, using bridges or guides to control the movement.	• Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.	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 is aesthetically pleasing. •. Personalising a design.	• Designing a automata toy which uses a mixture of structures and mechanisms. • Naming each mechanism, input and output accurately. • Storyboarding ideas	Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. • Understanding how linkages change the direction of a force. • Making things move at the same time. • Understanding and drawing cross-sectional diagrams to show the inner-workings of my design.
	Make	Following a design to create moving models that use levers and sliders.	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.	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	Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design.	Following a design brief to make an automata toy , 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.	Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. • Measuring, marking and cutting components accurately using a ruler and scissors. • Assembling components accurately to make a stable frame.

				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			• Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. • Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.
	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.	Evaluating own designs against design criteria. • Using peer feedback to modify a final design.	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 a final product based on: the accuracy of workmanship on performance	Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement.	Evaluating the work of others and receiving feedback on own work. • Applying points of improvement to their toys. • Describing changes they would make/do if they were to do the project again.

Knowledge	**Technical**	• To know that a mechanism is the parts of an object that move together. •To know that a mechanism moves an object To know that bridges and guides are bits of card that purposefully restrict the movement	• To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers.	To 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 the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs. To understand that kinetic energy is the energy that something (object/person) has by being in motion.
	Additional	To know that in Design and technology we call a plan a 'design'.	To know some real-life objects that contain mechanisms.	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 an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product. • To understand how to use a bench hook and saw safely. • To know that a set square can be used to help mark 90° angles. To understand that products change and evolve over time. • To know that aesthetics means how an object or product looks in design and technology

Mechanical Systems continued		**Wheels and Axels (Year B)**	
		Year 1	***Year 2***
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.	Making axels to support wheel function . • Experimenting with shapes adjusting the widths, lengths and thicknesses of materials used. • Cutting and assembling components neatly.
	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.	Evaluating own designs against design criteria. • Using peer feedback to modify a final design.
	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.	Evaluating own designs against design criteria. • Using peer feedback to modify a final design.
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.	

Progression of Knowledge and Skills DT

Structures		Baby Bear's Chair (Year A)		Pavilions (Year A)		Bridges (Year A)	
		Year 1	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 6***
Skills	**Design**	Thinking about what others might want from a design. ● Beginning to recognise how products and designs in the world around us solve certain needs. ● Considering who they are designing for – identifying the user. ● Stating what they intend to make and why – identifying the purpose. ● Talking about ideas, with purpose and user in mind. ● Talking about existing products when generating ideas. ● Using basic drawing skills to communicate ideas.	Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects.	• Designing a Pavillion with key features to appeal to a specific person/purpose. • Drawing and labelling a Pavillion design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours.	• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.	• Designing a stable structure that is able to support weight. • Creating a frame structure with a focus on triangulation.	● Identifying more complex problem statements that consider multiple factors and constraints with guidance. ● Developing more independence in generating ideas. ● Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. - Using a series of prototypes to refine and improve their designs
	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). ●	• 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	• 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	• 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	● Producing lists of equipment, materials and tools that they need for a task. ● Selecting materials, components or ingredients based on research or user needs. ● Assessing risks associated with different tools and equipment. ● Understanding and explaining the importance

		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. ● Beginning to cut large shapes and thicker materials like card.			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.	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.	of each safety rule. ● Consistently apply safety instructions. ● Using a ruler to accurately measure and draw lines and marks. ● In small groups, cutting harder wood with a saw. ● Cutting in a back-and-forth sawing motion where appropriate. ● Balancing aesthetics and functionality when creating parts of a design. ● Considering when best to apply finishing effects
	Evaluate	● Discussing existing products, saying what they like about them. ● Comparing two products and discuss which is better for a specific purpose. ● Saying what they like about their peers' designs and products. ● Accepting feedback and understanding it is meant to improve their work.	Exploring the features of structures. • Comparing the stability of different shapes. • Testing the strength of own structures. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of own structure.	• 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.	• 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.	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.
Knowledge	**Technical**	Recognising that different structures are used for different purposes. ● Exploring the features of structures . ● Describing structures as buildings	To know that shapes and structures with wide, flat bases or legs are the most stable. To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to	• 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.	• 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	● Understanding how to reinforce structures to make them more stable. ● Using triangulation to strengthen or stabilise a structure. ● The know that constraints are limits or conditions when making a product. ● To know that the environmental

		or freestanding structures. ● Making stable structures from card. ● Creating supporting structures to aid stability. ● Using stable objects like cylinders to create structures.	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			selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood.	impact is how the product and making the product might affect the environment. ● To know that original and innovative ideas are different from what has been made before. ● To know drawings and diagrams can be communicated in 3D. ● To know that annotations are detailed labels and comments on diagrams. ● To know that improving on prototypes can help to improve the final design. ● To know that materials and equipment lists help with planning. ● To know aesthetics are the way something looks. ● To know that risks are things that might go wrong. ● To know the shape of an object can affect both its aesthetics and function. ● To know aesthetics is how something looks. ● To know that the finish can make a product suitable to be used outside.
	Additional	● To know that different users may want different things from a design. ● 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 natural structures are those found in nature. • To know that man-made structures are those made by people.	To know the features of a Pavillion and their purpose. • To know that a façade is the front of a structure. -To understand that a Pavillion needs to be strong and stable To know that a paper net is a flat 2D shape that can	• To know that a pavilion is 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 understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.	To know that sustainability means thinking about the materials that were used to make a product and how the product was made. ● To know that their final product can still be improved by using different materials or techniques. ● To know that evaluating their designs in detail will help them understand its successful and less successful parts. ● To

		● 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 products will be better than others. ● To know that their ideas or products can be made better. ● To know that their ideas can improve someone else's work. ● To know that a structure is something that has been made and put together. ● To know that stable structures do not topple. ● To know that shapes and structures with wide, flat bases or legs are the most stable. ● To know that adding weight to the base of a structure can make it more stable.		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 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.		know that a frame structure supports or holds a shape, and is made up of strong parts joined together, like a skeleton or a climbing frame. ● To know how to reinforce structures. ● To know triangles can be used to reinforce structures. ● To know triangles can create strong and stable structures. ● To know that bracing is a way of reinforcing a structure.

Progression of Knowledge and Skills DT

Textiles		Puppets (Year B)		Egyptian Collar (Year B)		Recycled Bag (Year A)	
		Year 1	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 6***
Skills	**Design**	Using a template to create a design for a puppet.	Designing a Puppet	• Designing and making a template from an existing cushion and applying individual design criteria.	Writing design criteria for a product, articulating decisions made. • Designing an Egyptian Collar	• Designing a bag, considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components.	Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design.
	Make	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.	• 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	• 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 a fastening to a design.	• Creating a 3D bag from a 2D design. • Measuring, marking and cutting fabric accurately and independently . • Creating strong and secure blanket stitches when joining fabric. • Threading needles independently. • Using appliqué to attach pieces of fabric decoration. • Sewing blanket stitch to join fabric. • Applying blanket stitch so the spaces between the stitches are even and regular.	●Using a ruler to accurately measure and draw lines and marks. ●Using nets to create 3D objects. ●Using a combination of joining techniques to ensure strong joins (for example, using safety pins to hold fabric in place while a running stitch is sewn).

				(Cushions) or embellishing the collars based on design ideas (Egyptian collars).			
	Evaluate	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.	• 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.	• Testing and evaluating an end product and giving point for further improvements.	Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects.
Knowledge	**Technical**	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	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	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	• 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	• 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 small, neat stitches which are pulled taut are important	●Using pins effectively to secure a template to fabric without creases or bulges. ●Tying knots at the end of thread to secure it. ●Attaching objects like buttons using thread.

		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.	used to protect my fingers when sewing.	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.	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		
	Additional						To know how designers use pattern pieces when creating textile products. ●To know how nets can be folded to create 3D shapes. ●To know safety pins can golf fabric in place before sewing. ●To know consistently sized stitches improve the aesthetic of a product. ●To know the shape of a product can affect both its aesthetics and function. ●To know aesthetics is how something looks. ●To know complete

							products are sometimes made in parts that are sewn together

Food and Nutrition		**Balanced Diet (Year A)**		**Seasonal Cooking (Year B)**		**Come Dine with Me (Year B)**	
		Year 1	***Year 2***	***Year 3***	***Year 4***	***Year 5***	***Year 6***
Skills	**Design**	- Designing - Learning where fruit and vegetables grow	• Designing three wrap ideas.	• Describing how climate affects where foods grow.	• Designing a recipe within a given budget. • Conducting market research.	• Researching existing recipes. • Suggesting alternative ingredients.	• Writing a recipe, explaining the key steps, method and ingredients. • Including facts and drawings from research undertaken.
	Make	• Chopping fruit and vegetables safely to make a Wrap. Identifying if a food is a fruit or vegetable	• 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 a balanced diet.	• 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	• Following a recipe. • Understanding safety and hygiene rules. • Adapting a recipe.	• 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.

				ingredients based on a design brief.			
	Evaluate	• Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Comparing their own wrap with someone else's.	• Describing appearance, smell and taste. • Tasting and evaluating different food combinations. • Describing the information that should be included on a label.	• 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.	• 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 in productions. • Evaluating health and safety in production to minimise cross contamination.
Knowledge	**Technical**	• To know that vegetables can grow either above or below ground. • To know that a vegetable is any edible part of a plant - To know fruit and vegetables are important in our diet	• 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	• 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	• 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	• 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

			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	describe the flavour and texture of foods. • To know how to cut and 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	budgeting while planning ingredients for a recipe. • To know that products often have a target audience.		food before it appears on the supermarket shelf (Farm to Fork).

Food and Nutrition continued		**Smoothies (Year B)**	
		Year 1	***Year 2***
Skills	**Design**	• Designing smoothie carton packaging by-hand. • Learning where and how fruits and vegetables grow.	- Design 3 smoothie 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 smoothie. • Constructing a smoothie that meets a design brief. • Chopping foods to make a smoothie. • Snipping smaller foods instead of cutting. • Identifying the five food groups. • Learning about a 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. • Tasting and evaluating different food combinations. • Describing the information that should be included on a label.
Knowledge	**Technical**	• 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 a vegetable 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.

Electrical Systems		**Torches (Year A)**		**Doodlers (Year A)**	
		Year 3	***Year 4***	***Year 5***	***Year 6***
Skills	**Design**	• 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	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.	• 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 Doodler- identifying and naming the components required. • Drawing a design from three different perspectives. • Generating ideas through sketching and discussion. • Modelling ideas through prototypes. • Understanding the purpose of products, including what is meant by 'fit for purpose' and 'form over function'.
	Make	• Create a final design for the torches. • Measure and mark materials out using a template or ruler.	• Making a torch with a working electrical circuit and switch. • Using appropriate equipment to	• Altering a product's form and function by tinkering with its configuration. • Making a functional series circuit, incorporating a motor. • Constructing a	Decorating the doodler to a high quality finish. • Making and testing a circuit. • Incorporating a circuit into a base.

		• 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).	cut and attach materials. • Assembling a torch according to the design and success criteria.	product with consideration for the design criteria. • Breaking down the construction process into steps so that others can make the product.	
	Evaluate	• Learning to give and accept constructive criticism on own work and the work of others. • Testing the success of initial ideas against the design criteria and justifying opinions. • Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.	• Evaluating electrical products. • Testing and evaluating 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. • Determining which parts of a product affect its function and which parts affect its form. • Analysing whether changes in configuration positively or negatively affect an existing product. • Peer evaluating a set of instructions to build a product.	• Testing own and others finished doodlers, identifying what went well and making suggestions for improvement. • Gathering images and information about existing products. • Analysing a selection of products.
Knowledge	**Technical**	• 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	• To understand that electrical conductors are materials which electricity can pass through. • To understand that electrical insulators are materials which electricity cannot pass through. • To know that a battery contains stored electricity that can be used to power products. • To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can	• 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

		electrical system to work (function). • To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits.	be used to complete and break an electrical circuit.		
	Additional	• To understand the importance and purpose of information design. • To understand how material choices (such as mounting paper to corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached).	• 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.	• 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 know that 'form' means the shape and appearance of an object. •To know the difference between 'form' and 'function'. •To understand that 'fit for purpose' means that a product works how it should and is easy to use. • To know that form over purpose means that a product looks good but does not work very well. • To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind. • To understand the diagram perspectives 'top view', 'side view' and 'back'.

Digital World		**Mindful Moments (Year A)**		**Monitoring Devices (Year A)**	
		Year 3	***Year 4***	***Year 5***	***Year 6***
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	• Writing design criteria for a programmed timer (Micro:bit). • Exploring different mindfulness strategies. • Applying the results of my research to further inform my design criteria. • Developing a	• Researching (books, internet) for a particular (user's) animal's need. • 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	• 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 monitoring device. • Developing a product idea through annotated sketches. • Placing and

		of sale =e. • Developing design ideas through annotated sketches to create a product concept. • Developing design criteria to respond to a design brief.	prototype case for my mindful moment timer. • Using and manipulating shapes and clipart by using computer-aided design (CAD), to produce a logo. • Following a list of design requirements.	manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD.	manoeuvring 3D objects, using CAD. • Changing the properties of, or combining one or more 3D objects, using CAD.
	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.	Developing a prototype case for my mindful moment timer. • Creating 3D structures using modelling materials. • Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.	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 a monitoring device
	Evaluate	• Analysing and evaluating mindful moment timer. • Using feedback from peers to improve design.	• Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages. • Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I made. • Documenting and evaluating my project. • Understanding what a logo is and why they are important in the world of design and business. • Testing my program for bugs (errors in the code). •	• 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 monitoring 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 monitoring tool. • Explaining the key functions and features of my monitoring tool to the client as part of a product concept pitch. •

			Finding and fixing the bugs (debug) in my code. • Using an exhibition to gather feedback. • Gathering feedback from the user to make suggested improvements to a product.		Demonstrating a functional program as part of a product concept pitch
Knowledge	**Technical**	l • To understand that, in programming, a 'loop' is code that repeats something again and again until stopped. • To know that a Micro:bit is a pocket-sized, codeable computer. • To know that a simulator is able to replicate the functions of an existing piece of technology.	To 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.	
	Additional	•To know what the 'digital revolution' is and the features of some of the products that 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 some key events and facts from the history of plastic and how these affect the future outlook. • 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.