Structures		Windmill (Year B)	Castles (Year B)		Greenhouse (Year B)		
		Year 1 (Year B)	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Skills	**Design**	• Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design.	• 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 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 greenhouse 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	Designing a greenhouse featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs
	Make	• 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	• 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 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.	Making a range of different shaped greenhouses. • Using triangles to create strength • Building a wooden frame . • Independently measuring and marking wood accurately. • Selecting appropriate tools and equipment for particular tasks. • Using the correct techniques	Building a range of greenhouse 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.

						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.	
	Evaluate	Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't. • Suggest points for improvements.	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 greenhouse structure by identifying points of weakness and reinforcing them as necessary. • Suggesting points for improvements for own greenhouses 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 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.	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 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.	• 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 greenhouse can be a decorative building or structure for growing plants. . • 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.

Structures continued		Kites	
		Year 2 2D Flat	***Year 3 Box Kite***
Skills	**Design**	• 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 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 on CAD software.
	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.	Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. •
	Evaluate	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.
Knowledge	**Technical**	To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures.	
	Additional	• To know what a box/flat kite is • To understand that a kite needs to be strong and stable to withstand windy conditions. • 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	

Mechanical Systems		Moving Storybook (Year A)	Wheels and Axels (Year B)	Making a moving monster (Year B)		Automata toy		
		Year 1		*Year 2 N.B: Y2 to be exposed to pneumatic*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Skills	**Design**	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.	• 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.	Adapting mechanisms, when: ● they do not work as they should. ● to fit their vehicle design. ● to improve how they work after testing their vehicle.	Making linkages using card for levers and split pins for pivots. • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. •	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	Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. • Measuring, marking and cutting

				Cutting and assembling components neatly.	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		using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.	components accurately using a ruler and scissors. • Assembling components accurately to make a stable frame. • 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.	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.	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 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.	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.	• 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. Year 3 Specific: • 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 items that use wheels such as wheelbarrows, hamster wheels and vehicles.	• To know some real-life objects that contain mechanisms. Year 3 Specific: 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		Slingshot Car toy (Year C)		
		Year 4	*Year 5*	*Year 6*
Skills	**Design**	• 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.	• Designing a slingshot which uses a mixture of structures of pop up structures• Naming each mechanism, input and output accurately. • Storyboarding ideas	Experimenting with a range of mechanisms creating a design for a slingshot car based on a choice of mechanism 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	Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design.	Following a design brief to make an slingshot car, 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 accurately• Measuring, marking and cutting components accurately using a ruler and scissors. • Assembling components accurately to make a stable frame. • 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	• • Evaluating the speed of a final product based on: the effect of shape on speed and 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 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.		
	Additional	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.		

Textiles		Puppets (Year A)	Stockings (Year B)	Pouches (Year A)		Stuffed Toy		
		Year 1		*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Skills	**Design**	Using a template to create a design for a puppet.	Using a template to create a design for a stocking	Designing a pouch	Designing and making a template from an existing pouch and applying individual design criteria.	Writing design criteria for a product, articulating decisions made. • Designing a teddy	Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components	Designing a waistcoat in accordance to a specification linked to set of design criteria for a teddy • Annotating designs, to explain their decisions.
	Make	Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction.	Ice Tie dying fabric. . • Using joining methods to decorate a stocking. •	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 pouch• 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 sewing the edge and embellishing the	• 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 stuffed toy 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	Using a template when cutting fabric to ensure they achieve the correct shape. • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design. • Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating a

					pouches based on design ideas.		between the stitches are even and regular.	waistcoat, attaching features (such as appliqué) using thread. • Finishing the waistcoat with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches.
	Evaluate	Reflecting on a finished product, explaining likes and dislikes.	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 their work continually throughout the design, make and evaluate process.
Knowledge	**Technical**	To know that 'joining technique' means connecting two pieces of material together. • To know that there are various	To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing	Year 2: To know that sewing is a method of joining fabric. • To know that different stitches can be used when	Year 3: To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger	To know that a fastening is something which holds two pieces of material together for example a zipper, toggle,	• To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. • To	To understand that it is important to design clothing with the client/ target customer in mind. • To know that using a

		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.	a design idea is useful to see how an idea will look. To know that tie-dye uses dye to create pattern in fabric To know joining methods to add embellishments- glue, staples	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	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	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.	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.	template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches.

Food and Nutrition		Smoothies (Year A)	Eating Seasonally (Year A)		Healthy Meal (Year C) Global Meal (Year A)		
		Year 1	*Year 2*	*Year 3*	*Year 4 (Dessert)*	*Year 5 (Main)*	*Year 6 (Starter)*
Skills	**Design**	Designing smoothie carton packaging by-hand.	Designing three wrap ideas based on a food combination which work well together.	Designing a recipe for a savoury tart.	Designing a biscuit/ other desert within a given budget, drawing upon previous taste testing judgements. • Designing packaging for a biscuit/desert that targets a specific group.	• Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. • Writing an amended method for a recipe to incorporate the relevant changes to ingredients. • Designing appealing packaging to reflect a recipe. • Researching existing recipes to inform ingredient choices.	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 smoothie. • Juicing fruits safely to make a smoothie.	Chopping foods safely. • Constructing a tart that meets a design brief. • Grating foods to make a wrap. • Snipping smaller foods instead of cutting.	Following the instructions within a recipe. • Tasting seasonal ingredients. • Selecting seasonal ingredients. • Peeling ingredients safely. • Cutting safely with a vegetable knife.	Following a baking recipe, including the preparation of ingredients. • Cooking safely, following basic hygiene rules. • Adapting a recipe to meet the requirements of a target audience. • Using a cuboid net to create packaging.	Cutting and preparing vegetables safely. • Using equipment safely, including knives, hot pans and hobs. • Knowing how to avoid cross-contamination. • Following a step by step method carefully to make a 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. and when evaluating their own throughout the planning, preparation and cooking process. •
	Evaluate	Tasting and evaluating different food combinations. • Describing appearance,	Describing the taste, texture and smell of fruit and vegetables and herbs. • Taste testing food combinations and final products. • Describing the	• Establishing and using design criteria to help test and review dishes. • Describing the benefits of	• Evaluating a recipe, considering: taste, smell, texture and appearance. • Describing the	Identifying the nutritional differences between different products and recipes. • Identifying and describing healthy benefits of food groups.	Evaluating a recipe, considering: taste, smell, texture and origin of the food group. • Taste testing and scoring final

		smell and taste. • Suggesting information to be included on packaging. • Comparing their own smoothie with someone else's.	information that should be included on a label. •Evaluating food by giving a score	seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement when making a seasonal tart.	impact of the budget on the selection of ingredients. • Evaluating and comparing a range of food products. • Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).			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	**Technical**	To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds. • 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 (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber)	• 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 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 that not all fruits and vegetables can be grown in the UK. • To know 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. • To know that exported food is food which has been sent 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 understand the importance of budgeting while planning. • To know products often have a target audience.		• 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	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

				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.		boards can prevent cross-contamination. • To know that nutritional information is found on food packaging. • To know that food packaging serves many purposes.	understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).

Electrical Systems		Steady Hand Game		
		Year 4	*Year 5*	*Year 6*
Skills	**Design**	Designing a steady hand game, 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 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. • Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.
	Make	Making a game with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a steady hand game according to the design and success criteria.	Altering a product's form and function by tinkering with its configuration. • Constructing a product with consideration for the design criteria. • Breaking down the construction process into steps so that others can make the product.	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	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 games, identifying what went well and making suggestions for improvement. • Gathering images and information about existing children's toys. • Analysing a selection of existing children's toys.
Knowledge	**Technical**	• 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	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 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

		must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit.		
				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'.

Electrical Systems		**Fairground Ride**		
		Year 4	***Year 5***	***Year 6***
Skills	**Design**	Designing a fairground game, 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 fairground ride - 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 (toys), including what is meant by 'fit for purpose' and 'form over function'.

	Make	Making a fairground ride with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a fairground ride according to the design and success criteria.	Altering a product's form and function by tinkering with its configuration. • Constructing a product with consideration for the design criteria. • Breaking down the construction process into steps so that others can make the product.	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	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 games, identifying what went well and making suggestions for improvement. • Gathering images and information about existing children's toys. • Analysing a selection of existing children's toys.
Knowledge	**Technical**	• 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 be used to complete and break an electrical circuit.	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 '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		Wearable Light up Technology (Year B)		Mindful Moments Timer (Year A)		
		Year 2	*Year 3*	*Year 4*	*Year 5*	*Year 6*
Skills	**Design**	Problem solve as a group to explore a microbbit Design a 2D design on paper Develop ideas through sketches Use design criteria to respond to a design brief.	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.	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 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.	• Researching (books, internet) for a particular user's needs . • Developing design criteria based on research. •. • 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	As a group use a microbit to monitor by writing a set of instructions	Following a list of design requirements. • Writing a program to control (button press) and/or monitor (sense light) that will	Developing a prototype case for my mindful moment timer. • Creating 3D structures using modelling materials. • Programming a	Understanding the functional and aesthetic properties of plastics. Use microbits to monitor	Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo). • Explaining material

			initiate a flashing LED algorithm.	micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.		choices and why they were chosen as part of a product concept
	Evaluate	Look at current technology of wearable technology Evaluate the design in groups	Analysing and evaluating wearable technology. • 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). • Finding and fixing the bugs (debug) in my code. • Using an exhibition to gather feedback. • Gathering feedback	Explaining how my product would be useful for a mental healthy charity. Explain key function of my mindful timer	• 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 Demonstrating a functional program as part of a product concept pitch.

				from the user to make suggested improvements to a product.		
Knowledge	**Technical**	Microbit uses a program to make instructions To know that wearable technology means it is movable to different locations	• 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 understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met.	• To understand that sensors can be useful in products as they mean the product can function without human input.
	Additional	To know that people use technology every day To understand that CAD is a way of designing on a computer	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	•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	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

			what a focus group is by taking part in one.	exhibition is a way for companies to showcase products, meet potential new customers and gather feedback from users.		