

# Design and technology

## Progression of skills and knowledge

### Subject leader overview Year 1 - Year 6



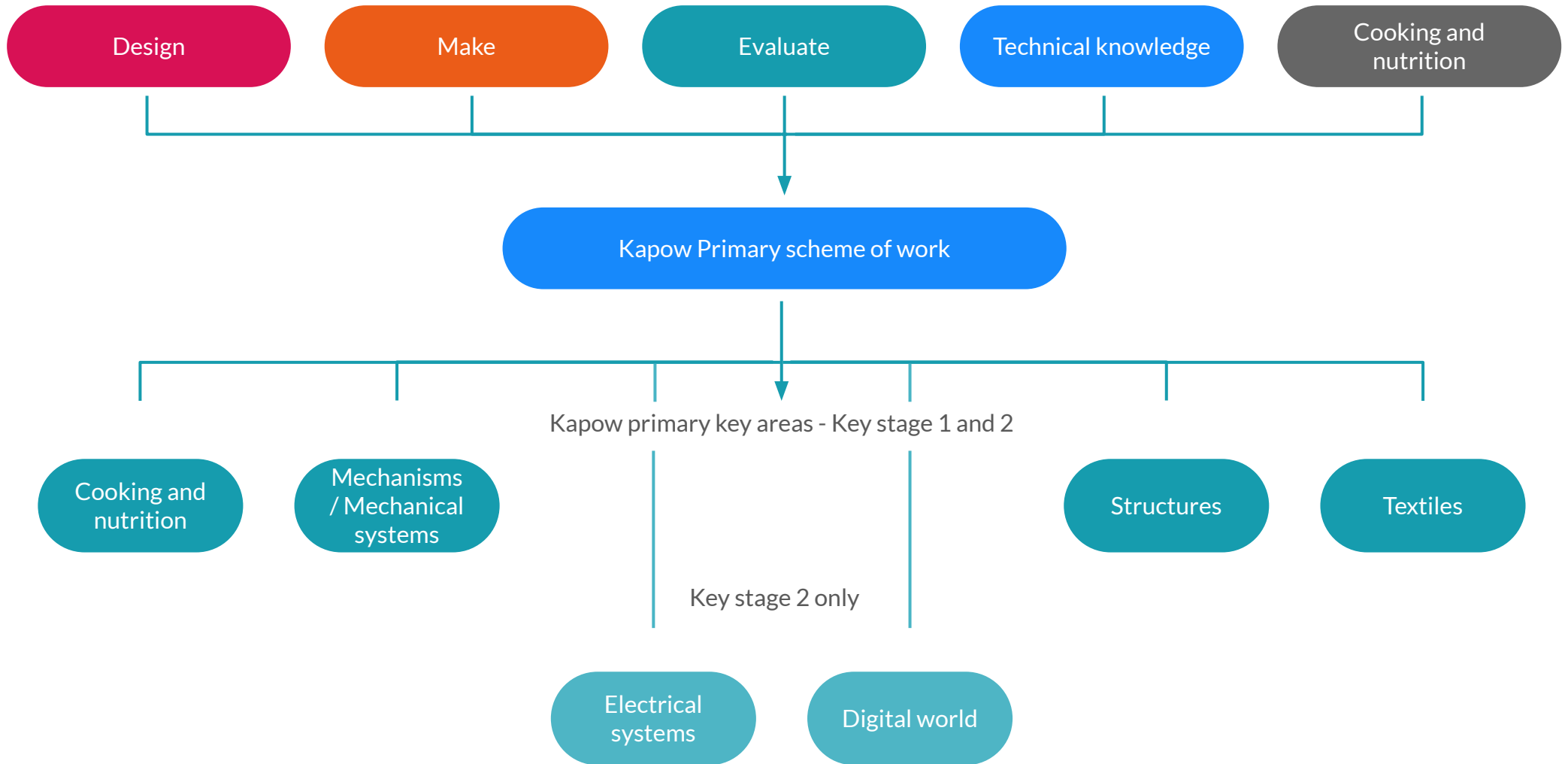
An overview of the **skills** and **knowledge** covered in each year group and strand and how these are developed through our Design and technology scheme of work.

This document was last updated on 03.03.22. Please check [here](#) for the most up to date version.



# How is the Design and technology scheme of work organised?

National Curriculum guidance



		Year 1	Year 2
		<u>Constructing a windmill</u>	<u>Baby bear's chair</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Learning the importance of a clear design criteria</li> <li>• Including individual preferences and requirements in a design</li> </ul>	<ul style="list-style-type: none"> <li>• Generating and communicating ideas using sketching and modelling</li> <li>• Learning about different types of structures, found in the natural world and in everyday objects</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Making stable structures from card, tape and glue</li> <li>• Learning how to turn 2D nets into 3D structures</li> <li>• Following instructions to cut and assemble the supporting structure of a windmill</li> <li>• Making functioning turbines and axles which are assembled into a main supporting structure</li> </ul>	<ul style="list-style-type: none"> <li>• Making a structure according to design criteria</li> <li>• Creating joints and structures from paper/card and tape</li> <li>• Building a strong and stiff structure by folding paper</li> </ul>
	Evaluate	N/A	<ul style="list-style-type: none"> <li>• Exploring the features of structures</li> <li>• Comparing the stability of different shapes</li> <li>• Testing the strength of own structures</li> <li>• Identifying the weakest part of a structure</li> <li>• Evaluating the strength, stiffness and stability of own structure</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To understand that the shape of materials can be changed to improve the strength and stiffness of structures</li> <li>• To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses)</li> <li>• To understand that axles are used in structures and mechanisms to make parts turn in a circle</li> <li>• To begin to understand that different structures are used for different purposes</li> <li>• To know that a structure is something that has been made and put together</li> </ul>	<ul style="list-style-type: none"> <li>• To know that shapes and structures with wide, flat bases or legs are the most stable</li> <li>• To understand that the shape of a structure affects its strength</li> <li>• To know that materials can be manipulated to improve strength and stiffness</li> <li>• To know that a structure is something which has been formed or made from parts</li> <li>• To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move</li> <li>• To know that a 'strong' structure is one which does not break easily</li> <li>• To know that a 'stiff' structure or material is one which does not bend easily</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To know that a client is the person I am designing for</li> <li>• To know that design criteria is a list of points to ensure the product meets the clients needs and wants</li> <li>• To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity</li> <li>• To know that windmill turbines use wind to turn and make the machines inside work</li> <li>• To know that a windmill is a structure with sails that are moved by the wind</li> <li>• To know the three main parts of a windmill are the turbine, axle and structure</li> </ul>	<ul style="list-style-type: none"> <li>• To know that natural structures are those found in nature</li> <li>• To know that man-made structures are those made by people</li> </ul>

		Year 3	Year 4
		<u>Constructing a castle</u>	<u>Pavilions</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Designing a castle with key features to appeal to a specific person/purpose</li> <li>• Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours</li> <li>• Designing and/or decorating a castle tower on CAD software</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect</li> <li>• Building frame structures designed to support weight</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Constructing a range of 3D geometric shapes using nets</li> <li>• Creating special features for individual designs</li> <li>• Making facades from a range of recycled materials</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a range of different shaped frame structures</li> <li>• Making a variety of free standing frame structures of different shapes and sizes</li> <li>• Selecting appropriate materials to build a strong structure and for the cladding</li> <li>• Reinforcing corners to strengthen a structure</li> <li>• Creating a design in accordance with a plan</li> <li>• Learning to create different textural effects with materials</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design</li> <li>• Suggesting points for modification of the individual designs</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating structures made by the class</li> <li>• Describing what characteristics of a design and construction made it the most effective</li> <li>• Considering effective and ineffective designs</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To understand that wide and flat based objects are more stable</li> <li>• To understand the importance of strength and stiffness in structures</li> </ul>	<ul style="list-style-type: none"> <li>• To understand what a frame structure is</li> <li>• To know that a 'free-standing' structure is one which can stand on its own</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose</li> <li>• To know that a façade is the front of a structure</li> <li>• To understand that a castle needed to be strong and stable to withstand enemy attack</li> <li>• To know that a paper net is a flat 2D shape that can become a 3D shape once assembled</li> <li>• To know that a design specification is a list of success criteria for a product</li> </ul>	<ul style="list-style-type: none"> <li>• To know that a pavilions ia a decorative building or structure for leisure activities</li> <li>• To know that cladding can be applied to structures for different effects.</li> <li>• To know that aesthetics are how a product looks</li> <li>• To know that a product's function means its purpose</li> <li>• To understand that the target audience means the person or group of people a product is designed for</li> <li>• To know that architects consider light, shadow and patterns when designing</li> </ul>

		Year 5	Year 6
		<u>Bridges</u>	<u>Playgrounds</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Designing a stable structure that is able to support weight</li> <li>• Creating frame structure with focus on triangulation</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Making a range of different shaped beam bridges</li> <li>• Using triangles to create truss bridges that span a given distance and supports a load</li> <li>• Building a wooden bridge structure</li> <li>• Independently measuring and marking wood accurately</li> <li>• Selecting appropriate tools and equipment for particular tasks</li> <li>• Using the correct techniques to saws safely</li> <li>• Identifying where a structure needs reinforcement and using card corners for support</li> <li>• Explaining why selecting appropriating materials is an important part of the design process</li> <li>• Understanding basic wood functional properties</li> </ul>	<ul style="list-style-type: none"> <li>• Building a range of play apparatus structures drawing upon new and prior knowledge of structures</li> <li>• Measuring, marking and cutting wood to create a range of structures</li> <li>• Using a range of materials to reinforce and add decoration to structures</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary</li> <li>• Suggesting points for improvements for own bridges and those designed by others</li> </ul>	<ul style="list-style-type: none"> <li>• Improving a design plan based on peer evaluation</li> <li>• Testing and adapting a design to improve it as it is developed</li> <li>• Identifying what makes a successful structure</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To understand some different ways to reinforce structures</li> <li>• To understand how triangles can be used to reinforce bridges</li> <li>• To know that properties are words that describe the form and function of materials</li> <li>• To understand why material selection is important based on their properties</li> <li>• To understand the material (functional and aesthetic) properties of wood</li> </ul>	<ul style="list-style-type: none"> <li>• To know that structures can be strengthened by manipulating materials and shapes</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To understand the difference between arch, beam, truss and suspension bridges</li> <li>• To understand how to carry and use a saw safely</li> </ul>	<ul style="list-style-type: none"> <li>• To understand what a 'footprint plan' is</li> <li>• To understand that in the real world, design, can impact users in positive and negative ways</li> <li>• To know that a prototype is a cheap model to test a design idea</li> </ul>

		Year 1		Year 2	
		<u>Making a moving storybook</u>	<u>Wheels and axles</u>	<u>Fairground wheel</u>	<u>Making a moving monster</u>
Skills	Design	<ul style="list-style-type: none"> <li>Explaining how to adapt mechanisms, using bridges or guides to control the movement</li> <li>Designing a moving story book for a given audience</li> </ul>	<ul style="list-style-type: none"> <li>Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move</li> <li>Creating clearly labelled drawings which illustrate movement</li> </ul>	<ul style="list-style-type: none"> <li>Selecting a suitable linkage system to produce the desired motions</li> <li>Designing a wheel Selecting appropriate materials based on their properties</li> </ul>	<ul style="list-style-type: none"> <li>Creating a class design criteria for a moving monster</li> <li>Designing a moving monster for a specific audience in accordance with a design criteria</li> </ul>
	Make	<ul style="list-style-type: none"> <li>Following a design to create moving models that use levers and sliders</li> </ul>	<ul style="list-style-type: none"> <li>Adapting mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>Selecting materials according to their characteristics</li> <li>Following a design brief</li> </ul>	<ul style="list-style-type: none"> <li>Making linkages using card for levers and split pins for pivots</li> <li>Experimenting with linkages adjusting the widths, lengths and thicknesses of card used</li> <li>Cutting and assembling components neatly</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed</li> <li>Reviewing the success of a product by testing it with its intended audience</li> </ul>	<ul style="list-style-type: none"> <li>Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating different designs</li> <li>Testing and adapting a design</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating own designs against design criteria</li> <li>Using peer feedback to modify a final design</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>To know that a mechanism is the parts of an object that move together</li> <li>To know that a slider mechanism moves an object from side to side</li> <li>To know that a slider mechanism has a slider, slots , guides and an object</li> <li>To know that bridges and guides are bits of card that purposefully restrict the movement of the slider</li> </ul>	<ul style="list-style-type: none"> <li>To know that wheels need to be round to rotate and move</li> <li>To understand that for a wheel to move it must be attached to a rotating axle</li> <li>To know that an axle moves within an axle holder which is fixed to the vehicle or toy</li> <li>To know that the frame of a vehicle (chassis) needs to be balanced</li> </ul>	<ul style="list-style-type: none"> <li>To know that different materials have different properties and are therefore suitable for different uses</li> </ul>	<ul style="list-style-type: none"> <li>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement</li> <li>To know that there is always an input and output in a mechanism</li> <li>To know that an input is the energy that is used to start something working</li> <li>To know that an output is the movement that happens as a result of the input</li> <li>To know that a lever is something that turns on a pivot</li> <li>To know that a linkage mechanism is made up of a series of levers</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>To know that in Design and technology we call a plan a 'design'</li> </ul>	<ul style="list-style-type: none"> <li>To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles</li> </ul>	<ul style="list-style-type: none"> <li>To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder</li> <li>To know that it is important to test my design as I go along so that I can solve any problems that may occur</li> </ul>	<ul style="list-style-type: none"> <li>To know some real-life objects that contain mechanisms</li> </ul>

		Year 3	Year 4
		<u>Pneumatic toys</u>	<u>Making a slingshot car</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Designing a toy which uses a pneumatic system</li> <li>• Developing design criteria from a design brief</li> <li>• Generating ideas using thumbnail sketches and exploded diagrams</li> <li>• Learning that different types of drawings are used in design to explain ideas clearly</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a shape that reduces air resistance</li> <li>• Drawing a net to create a structure from</li> <li>• Choosing shapes that increase or decrease speed as a result of air resistance</li> <li>• Personalising a design</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Creating a pneumatic system to create a desired motion</li> <li>• Building secure housing for a pneumatic system</li> <li>• Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy</li> <li>• Selecting materials due to their functional and aesthetic characteristics</li> <li>• Manipulating materials to create different effects by cutting, creasing, folding, weaving</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring, marking, cutting and assembling with increasing accuracy</li> <li>• Making a model based on a chosen design</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Using the views of others to improve designs</li> <li>• Testing and modifying the outcome, suggesting improvements</li> <li>• Understanding the purpose of exploded-diagrams through the eyes of a designer and their client</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To understand how pneumatic systems work</li> <li>• To understand that pneumatic systems can be used as part of a mechanism</li> <li>• To know that pneumatic systems operate by drawing in, releasing and compressing air</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that all moving things have kinetic energy</li> <li>• To understand that kinetic energy is the energy that something (object/person) has by being in motion</li> <li>• To know that air resistance is the level of drag on an object as it is forced through the air</li> <li>• To understand that the shape of a moving object will affect how it moves due to air resistance.</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To understand how sketches, drawings and diagrams can be used to communicate design ideas</li> <li>• To know that exploded-diagrams are used to show how different parts of a product fit together</li> <li>• To know that thumbnail sketches are small drawings to get ideas down on paper quickly</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that products change and evolve over time</li> <li>• To know that aesthetics means how an object or product looks in design and technology</li> <li>• To know that a template is a stencil you can use to help you draw the same shape accurately</li> <li>• To know that a birds-eye view means a view from a high angle (as if a bird in flight)</li> <li>• To know that graphics are images which are designed to explain or advertise something</li> <li>• To know that it is important to assess and evaluate design ideas and models against a list of design criteria.</li> </ul>

		Year 5	Year 6
		<u>Pop up book</u>	<u>Automata toys</u>
<b>Skills</b>	<b>Design</b>	<ul style="list-style-type: none"> <li>• Designing a pop-up book which uses a mixture of structures and mechanisms</li> <li>• Naming each mechanism, input and output accurately</li> <li>• Storyboarding ideas for a book</li> </ul>	<ul style="list-style-type: none"> <li>• Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement</li> <li>• Understanding how linkages change the direction of a force</li> <li>• Making things move at the same time</li> <li>• Understanding and drawing cross-sectional diagrams to show the inner-working</li> </ul>
	<b>Make</b>	<ul style="list-style-type: none"> <li>• Following a design brief to make a pop up book, neatly and with focus on accuracy</li> <li>• Making mechanisms and/or structures using sliders, pivots and folds to produce movement</li> <li>• Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring, marking and checking the accuracy of the jelutong and dowel pieces required</li> <li>• Measuring, marking and cutting components accurately using a ruler and scissors</li> <li>• Assembling components accurately to make a stable frame</li> <li>• Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles</li> <li>• Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set</li> </ul>
	<b>Evaluate</b>	<ul style="list-style-type: none"> <li>• Evaluating the work of others and receiving feedback on own work</li> <li>• Suggesting points for improvement</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating the work of others and receiving feedback on own work</li> <li>• Applying points of improvements</li> <li>• Describing changes they would make/do if they were to do the project again</li> </ul>
<b>Knowledge</b>	<b>Technical</b>	<ul style="list-style-type: none"> <li>• To know that mechanisms control movement</li> <li>• To understand that mechanisms that can be used to change one kind of motion into another</li> <li>• To understand how to use sliders, pivots and folds to create paper-based mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that the mechanism in an automata uses a system of cams, axles and followers</li> <li>• To understand that different shaped cams produce different outputs</li> </ul>
	<b>Additional</b>	<ul style="list-style-type: none"> <li>• To know that a design brief is a description of what I am going to design and make</li> <li>• To know that designers often want to hide mechanisms to make a product more aesthetically pleasing</li> </ul>	<ul style="list-style-type: none"> <li>• To know that an automata is a hand powered mechanical toy</li> <li>• To know that a cross-sectional diagram shows the inner workings of a product</li> <li>• To understand how to use a bench hook and saw safely</li> <li>• To know that a set square can be used to help mark 90° angles</li> </ul>



		Year 3	Year 4
		<u>Electric poster</u> <b>New!</b>	<u>Torches</u>
Skills	Design	<ul style="list-style-type: none"> <li>Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas</li> <li>Generate a final design for the electric poster with consideration to the client's needs and design criteria</li> <li>Design an electric poster that fits the requirements of a given brief</li> <li>Plan the positioning of the bulb (circuit component) and its purpose</li> </ul>	<ul style="list-style-type: none"> <li>Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas</li> </ul>
	Make	<ul style="list-style-type: none"> <li>Create a final design for the electric poster</li> <li>Mount the poster onto corrugated card to improve its strength and withstand the weight of the circuit on the rear</li> <li>Measure and mark materials out using a template or ruler</li> <li>Fit an electrical component (bulb)</li> <li>Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge)</li> </ul>	<ul style="list-style-type: none"> <li>Making a torch with a working electrical circuit and switch</li> <li>Using appropriate equipment to cut and attach materials</li> <li>Assembling a torch according to the design and success criteria</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>Learning to give and accept constructive criticism on own work and the work of others</li> <li>Testing the success of initial ideas against the design criteria and justifying opinions</li> <li>Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating electrical products</li> <li>Testing and evaluating the success of a final product and taking inspiration from the w</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit</li> <li>To understand common features of an electric product (switch, battery or plug, dials, buttons etc.)</li> <li>To list examples of common electric products (kettle, remote control etc.)</li> <li>To understand that an electric product uses an electrical system to work (function)</li> <li>To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits</li> </ul>	<ul style="list-style-type: none"> <li>To understand that electrical conductors are materials which electricity can pass through</li> <li>To understand that electrical insulators are materials which electricity cannot pass through</li> <li>To know that a battery contains stored electricity that can be used to power products</li> <li>To know that an electrical circuit must be complete for electricity to flow</li> <li>To know that a switch can be used to complete and break an electrical circuit</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>To understand the importance and purpose of information design</li> <li>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).</li> </ul>	<ul style="list-style-type: none"> <li>To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens</li> <li>To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison</li> </ul>

		Year 5	Year 6
		<u>Electronic greetings cards</u>	<u>Steady hand game</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Designing an electronic greetings card with a copper track circuit and components</li> <li>• Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery</li> <li>• Writing design criteria for an electronic greeting card</li> <li>• Compiling a moodboard relevant to my chosen theme, purpose and recipient</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a steady hand game - identifying and naming the components required</li> <li>• Drawing a design from three different perspectives</li> <li>• Generating ideas through sketching and discussion</li> <li>• Modelling ideas through prototypes</li> <li>• Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Making a functional series circuit</li> <li>• Creating an electronics greeting card, referring to a design criteria</li> <li>• Mapping out where different components of the circuit will go</li> </ul>	<ul style="list-style-type: none"> <li>• Constructing a stable base for a game</li> <li>• Accurately cutting, folding and assembling a net</li> <li>• Decorating the base of the game to a high quality finish</li> <li>• Making and testing a circuit Incorporating a circuit into a base</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Evaluating a peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component</li> <li>• Stating what Sir Rowland Hill invented and why it was important for greeting cards</li> <li>• Analysing and evaluating a range of existing greeting cards</li> </ul>	<ul style="list-style-type: none"> <li>• Testing own and others finished games, identifying what went well and making suggestions for improvement</li> <li>• Gathering images and information about existing children's toys</li> <li>• Analysing a selection of existing children's toys</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To know the key components used to create a functioning circuit</li> <li>• To know that copper is a conductor and can be used as part of a circuit</li> <li>• To understand that breaks in a circuit will stop it from working</li> <li>• To understand that a series circuit only has one path for the electrical current to flow from positive to negative</li> <li>• To know that we use symbols to represent components in a circuit diagram</li> <li>• To know the names of the components in a basic series circuit: crocodile wires, LED (light-emitting diode), battery holder, battery, cell</li> </ul>	<ul style="list-style-type: none"> <li>• To know that batteries contain acid, which can be dangerous if they leak</li> <li>• To know the names of the components in a basic series circuit including a buzzer</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To know that product analysis is critiquing the strengths and weaknesses of a product</li> <li>• To know that 'mass production' is when a product is made in large quantities by a machine, usually in a factory</li> <li>• To know that one-off production is when only one of a product is made by hand</li> <li>• To know that 'bespoke' means a product was made for a particular reason or person</li> <li>• To understand the development of personal message exchange through to the invention of the Penny Black stamp, and exchanging of greeting cards</li> <li>• To know that a moodboard may include words, sketches, textures, colours, material samples etc. and can act as inspiration when designing</li> </ul>	<ul style="list-style-type: none"> <li>• To know that 'form' means the shape and appearance of an object</li> <li>• To know the difference between 'form' and 'function'</li> <li>• To understand that 'fit for purpose' means that a product works how it should and is easy to use</li> <li>• To know that form over purpose means that a product looks good but does not work very well</li> <li>• To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind</li> <li>• To understand the diagram perspectives 'top view', 'side view' and 'back'</li> </ul>

		Year 1	Year 2
		<u>Fruit and vegetables</u>	<u>A balanced diet</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Designing smoothie carton packaging by-hand or on ICT software</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a healthy wrap based on a food combination which work well together</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Chopping fruit and vegetables safely to make a smoothie</li> <li>• Identifying if a food is a fruit or a vegetable</li> <li>• Learning where and how fruits and vegetables grow</li> </ul>	<ul style="list-style-type: none"> <li>• Slicing food safely using the bridge or claw grip</li> <li>• Constructing a wrap that meets a design brief</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Tasting and evaluating different food combinations</li> <li>• Describing appearance, smell and taste</li> <li>• Suggesting information to be included on packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Describing the taste, texture and smell of fruit and vegetables</li> <li>• Taste testing food combinations and final products</li> <li>• Describing the information that should be included on a label</li> <li>• Evaluating which grip was most effective</li> </ul>
Knowledge	Cooking and nutrition	<ul style="list-style-type: none"> <li>• Understanding the difference between fruits and vegetables</li> <li>• To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber)</li> <li>• To know that a blender is a machine which mixes ingredients together into a smooth liquid</li> <li>• To know that a fruit has seeds and a vegetable does not</li> <li>• To know that fruits grow on trees or vines</li> <li>• To know that vegetables can grow either above or below ground</li> <li>• To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber)</li> </ul>	<ul style="list-style-type: none"> <li>• To know that 'diet' means the food and drink that a person or animal usually eats</li> <li>• To understand what makes a balanced diet</li> <li>• To know where to find the nutritional information on packaging</li> <li>• To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar</li> <li>• To understand that I should eat a range of different foods from each food group, and roughly how much of each food group</li> <li>• To know that nutrients are substances in food that all living things need to make energy, grow and develop</li> <li>• To know that 'ingredients' means the items in a mixture or recipe</li> <li>• To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy</li> <li>• To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'</li> </ul>

		Year 3	Year 4
		<u>Eating seasonally</u>	<u>Adapting a recipe</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a biscuit within a given budget, drawing upon previous taste testing</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination</li> <li>• Following the instructions within a recipe</li> </ul>	<ul style="list-style-type: none"> <li>• Following a baking recipe</li> <li>• Cooking safely, following basic hygiene rules</li> <li>• Adapting a recipe</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Establishing and using design criteria to help test and review dishes</li> <li>• Describing the benefits of seasonal fruits and vegetables and the impact on the environment</li> <li>• Suggesting points for improvement when making a seasonal tart</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating a recipe, considering: taste, smell, texture and appearance</li> <li>• Describing the impact of the budget on the selection of ingredients</li> <li>• Evaluating and comparing a range of products</li> <li>• Suggesting modifications</li> </ul>
Knowledge	Cooking and nutrition	<ul style="list-style-type: none"> <li>• To know that not all fruits and vegetables can be grown in the UK</li> <li>• To know that climate affects food growth</li> <li>• To know that vegetables and fruit grow in certain seasons</li> <li>• To know that cooking instructions are known as a 'recipe'</li> <li>• To know that imported food is food which has been brought into the country</li> <li>• To know that exported food is food which has been sent to another country.</li> <li>• To understand that imported foods travel from far away and this can negatively impact the environment</li> <li>• To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre</li> <li>• To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health</li> <li>• To know safety rules for using, storing and cleaning a knife safely</li> <li>• To know that similar coloured fruits and vegetables often have similar nutritional benefits</li> </ul>	<ul style="list-style-type: none"> <li>• To know that the amount of an ingredient in a recipe is known as the 'quantity'</li> <li>• To know that it is important to use oven gloves when removing hot food from an oven</li> <li>• To know the following cooking techniques: sieving, creaming, rubbing method, cooling</li> <li>• To understand the importance of budgeting while planning ingredients for biscuits</li> </ul>

		Year 5	Year 6
		<u>What could be healthier?</u>	<u>Come dine with me</u>
Skills	Design	<ul style="list-style-type: none"> <li>Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients</li> <li>Writing an amended method for a recipe to incorporate the relevant changes to ingredients</li> <li>Designing appealing packaging to reflect a recipe</li> </ul>	<ul style="list-style-type: none"> <li>Writing a recipe, explaining the key steps, method and ingredients</li> <li>Including facts and drawings from research undertaken</li> </ul>
	Make	<ul style="list-style-type: none"> <li>Cutting and preparing vegetables safely</li> <li>Using equipment safely, including knives, hot pans and hobs</li> <li>Knowing how to avoid cross-contamination</li> <li>Following a step by step method carefully to make a recipe</li> </ul>	<ul style="list-style-type: none"> <li>Following a recipe, including using the correct quantities of each ingredient</li> <li>Adapting a recipe based on research</li> <li>Working to a given timescale</li> <li>Working safely and hygienically with independence</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>Identifying the nutritional differences between different products and recipes</li> <li>Identifying and describing healthy benefits of food groups</li> </ul>	<ul style="list-style-type: none"> <li>Evaluating a recipe, considering: taste, smell, texture and origin of the food group</li> <li>Taste testing and scoring final products</li> <li>Suggesting and writing up points of improvements in productions</li> <li>Evaluating health and safety in production to minimise cross contamination</li> </ul>
Knowledge	Cooking and nutrition	<ul style="list-style-type: none"> <li>To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues</li> <li>To know that I can adapt a recipe to make it healthier by substituting ingredients</li> <li>To know that I can use a nutritional calculator to see how healthy a food option is</li> <li>To understand that 'cross-contamination' means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects</li> </ul>	<ul style="list-style-type: none"> <li>To know that 'flavour' is how a food or drink tastes</li> <li>To know that many countries have 'national dishes' which are recipes associated with that country</li> <li>To know that 'processed food' means food that has been put through multiple changes in a factory</li> <li>To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides</li> <li>To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork)</li> </ul>

		Year 1	Year 2
		<u>Puppets</u>	<u>Pouches</u>
<b>Skills</b>	<b>Design</b>	<ul style="list-style-type: none"> <li>Using a template to create a design for a puppet</li> </ul>	<ul style="list-style-type: none"> <li>Designing a pouch</li> </ul>
	<b>Make</b>	<ul style="list-style-type: none"> <li>Cutting fabric neatly with scissors</li> <li>Using joining methods to decorate a puppet</li> <li>Sequencing steps for construction</li> </ul>	<ul style="list-style-type: none"> <li>Selecting and cutting fabrics for sewing</li> <li>Decorating a pouch using fabric glue or running stitch</li> <li>Threading a needle</li> <li>Sewing running stitch, with evenly spaced, neat, even stitches to join fabric</li> <li>Neatly pinning and cutting fabric using a template</li> </ul>
	<b>Evaluate</b>	<ul style="list-style-type: none"> <li>Reflecting on a finished product, explaining likes and dislikes</li> </ul>	<ul style="list-style-type: none"> <li>Troubleshooting scenarios posed by teacher</li> <li>Evaluating the quality of the stitching on others' work</li> <li>Discussing as a class, the success of their stitching against the success criteria</li> <li>Identifying aspects of their peers' work that they particularly like and why</li> </ul>
<b>Knowledge</b>		<ul style="list-style-type: none"> <li>To know that 'joining technique' means connecting two pieces of material together</li> <li>To know that there are various temporary methods of joining fabric by using staples, glue or pins</li> <li>To understand that different techniques for joining materials can be used for different purposes</li> <li>To understand that a template (or fabric pattern) is used to cut out the same shape multiple times</li> <li>To know that drawing a design idea is useful to see how an idea will look</li> </ul>	<ul style="list-style-type: none"> <li>To know that sewing is a method of joining fabric</li> <li>To know that different stitches can be used when sewing</li> <li>To understand the importance of tying a knot after sewing the final stitch</li> <li>To know that a thimble can be used to protect my fingers when sewing</li> </ul>

		Year 3	Year 4
		<u>Cushions</u>	<u>Fastenings</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Designing and making a template from an existing cushion and applying individual design criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Writing design criteria for a product, articulating decisions made</li> <li>• Designing a personalised book sleeve</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Following design criteria to create a cushion</li> <li>• Selecting and cutting fabrics with ease using fabric scissors</li> <li>• Threading needles with greater independence</li> <li>• Tying knots with greater independence</li> <li>• Sewing cross stitch to join fabric</li> <li>• Decorating fabric using appliqué</li> <li>• Completing design ideas with stuffing and sewing the edges</li> </ul>	<ul style="list-style-type: none"> <li>• Making and testing a paper template with accuracy and in keeping with the design criteria</li> <li>• Measuring, marking and cutting fabric using a paper template</li> <li>• Selecting a stitch style to join fabric, working neatly sewing small neat stitches</li> <li>• Incorporating fastening to a design</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Evaluating an end product and thinking of other ways in which to create similar items</li> </ul>	<ul style="list-style-type: none"> <li>• Testing and evaluating an end product against the original design criteria</li> <li>• Deciding how many of the criteria should be met for the product to be considered successful</li> <li>• Suggesting modifications for improvement</li> <li>• Articulating the advantages and disadvantages of different fastening types</li> </ul>
Knowledge		<ul style="list-style-type: none"> <li>• To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric</li> <li>• To know that when two edges of fabric have been joined together it is called a seam</li> <li>• To know that it is important to leave space on the fabric for the seam</li> <li>• To understand that some products are turned inside out after sewing so the stitching is hidden</li> </ul>	<ul style="list-style-type: none"> <li>• To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro</li> <li>• To know that different fastening types are useful for different purposes</li> <li>• To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions</li> </ul>

		Year 5	Year 6
		<u>Stuffed toys</u>	<u>Waistcoats</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Designing a stuffed toy considering the main component shapes required and creating an appropriate template</li> <li>• Considering the proportions of individual components</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme</li> <li>• Annotating designs</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Creating a 3D stuffed toy from a 2D design</li> <li>• Measuring, marking and cutting fabric accurately and independently</li> <li>• Creating strong and secure blanket stitches when joining fabric</li> <li>• Threading needles independently</li> <li>• Using applique to attach pieces of fabric decoration</li> <li>• Sewing blanket stitch to join fabric</li> <li>• Applying blanket stitch so the space between the stitches are even and regular</li> </ul>	<ul style="list-style-type: none"> <li>• Using a template when pinning panels onto fabric</li> <li>• Marking and cutting fabric accurately, in accordance with a design</li> <li>• Sewing a strong running stitch, making small, neat stitches and following the edge</li> <li>• Tying strong knots</li> <li>• Decorating a waistcoat -attaching objects using thread and adding a secure fastening</li> <li>• Learning different decorative stitches</li> <li>• Sewing accurately with even regularity of stitches</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Testing and evaluating an end product and giving point for further improvements</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating work continually as it is created</li> </ul>
Knowledge		<ul style="list-style-type: none"> <li>• To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric</li> <li>• To understand that it is easier to finish simpler designs to a high standard</li> <li>• To know that soft toys are often made by creating appendages separately and then attaching them to the main body</li> <li>• 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</li> </ul>	<ul style="list-style-type: none"> <li>• To understand that it is important to design clothing with the client/ target customer in mind</li> <li>• To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric</li> <li>• To understand the importance of consistently sized stitches</li> </ul>



		Year 3	Year 4
		<u>Electronic charm</u>	<u>Mindful moments timer</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Problem solving by suggesting potential features on a Micro: bit and justifying my ideas</li> <li>• Developing design ideas for a technology pouch</li> <li>• Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge</li> </ul>	<ul style="list-style-type: none"> <li>• Writing design criteria for a programmed timer (Micro:bit)</li> <li>• Exploring different mindfulness strategies</li> <li>• Applying the results of my research to further inform my design criteria</li> <li>• Developing a prototype case for my mindful moment timer</li> <li>• Using and manipulating shapes and clipart, using computer-aided design (CAD), to produce a logo</li> <li>• Following a list of design requirements</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Using a template when cutting and assembling the pouch</li> <li>• Following a list of design requirements</li> <li>• Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch</li> <li>• Applying functional features such as using foam to create soft buttons</li> </ul>	<ul style="list-style-type: none"> <li>• Developing a prototype case for my mindful moment timer</li> <li>• Creating a 3D structure using a net</li> <li>• Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Analysing and evaluating an existing product</li> <li>• Identifying the key features of a pouch</li> </ul>	<ul style="list-style-type: none"> <li>• Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages</li> <li>• Evaluating my micro:bit program against points on my design criteria and amending them to include any changes I made</li> <li>• Documenting and evaluating my project</li> <li>• Understanding what a logo is and why they are important in the world of design and business</li> <li>• Testing my program for bugs (errors in the code)</li> <li>• Finding and fixing the bugs (debug) in my code</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To understand that in programming a 'loop' is code that repeats something again and again until stopped</li> <li>• To know that a Micro:bit is a pocket-sized, codeable computer</li> <li>• Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm</li> </ul>	<ul style="list-style-type: none"> <li>• To understand what variables are in programming</li> <li>• To know some of the features of a Micro:bit</li> <li>• To know that an algorithm is a set of instructions to be followed by the computer</li> <li>• To know that it is important to check my code for errors (bugs)</li> <li>• To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result</li> <li>• To know that in Design and technology the term 'smart' means a programmed product</li> <li>• To know the difference between analogue and digital technologies</li> <li>• To understand what is meant by 'point of sale display'</li> <li>• To know that CAD stands for Computer-aided design</li> </ul>	<ul style="list-style-type: none"> <li>• Understand the terms 'ergonomic' and 'aesthetic'</li> <li>• Know that a prototype is a 3D model made out of cheap materials, that allows us</li> <li>• To test design ideas and make better decisions about size, shape and materials</li> </ul>

		Year 5	Year 6
		<u>Monitoring devices</u>	<u>Navigating the world</u>
Skills	Design	<ul style="list-style-type: none"> <li>• Researching (books, internet) for a particular (user's) animal's needs</li> <li>• Developing design criteria based on research</li> <li>• Generating multiple housing ideas using building bricks</li> <li>• Understanding what a virtual model is and the pros and cons of traditional and CAD modelling</li> <li>• Placing and manoeuvring 3D objects, using CAD</li> <li>• Changing the properties of, or combine one or more 3D objects, using CAD</li> </ul>	<ul style="list-style-type: none"> <li>• Writing a design brief from information submitted by a client</li> <li>• Developing design criteria to fulfil the client's request</li> <li>• Considering and suggesting additional functions for my navigation tool</li> <li>• Developing a product idea through annotated sketches</li> <li>• Placing and manoeuvring 3D objects, using CAD</li> <li>• Changing the properties of, or combine one or more 3D objects, using CAD</li> </ul>
	Make	<ul style="list-style-type: none"> <li>• Understanding the functional and aesthetic properties of plastics</li> <li>• Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range</li> </ul>	<ul style="list-style-type: none"> <li>• Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo)</li> <li>• Explaining material choices and why they were chosen as part of a product concept</li> <li>• Programming an N,E, S,W cardinal compass</li> </ul>
	Evaluate	<ul style="list-style-type: none"> <li>• Stating an event or fact from the last 100 years of plastic history</li> <li>• Explaining how plastic is affecting planet Earth and suggesting ways to make more sustainable choices</li> <li>• Explaining key functions in my program (audible alert, visuals)</li> <li>• Explaining how my product would be useful for an animal carer including programmed features</li> </ul>	<ul style="list-style-type: none"> <li>• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool</li> <li>• Developing an awareness of sustainable design</li> <li>• Identifying key industries that utilise 3D CAD modelling and explain why</li> <li>• Describing how the product concept fits the client's request and how it will benefit the customers</li> <li>• Explaining the key functions in my program, including any additions</li> <li>• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool</li> <li>• Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch</li> <li>• Demonstrating a functional program as part of a product concept</li> </ul>
Knowledge	Technical	<ul style="list-style-type: none"> <li>• To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record</li> <li>• To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose</li> <li>• To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met</li> </ul>	<ul style="list-style-type: none"> <li>• To know that accelerometers can detect movement</li> <li>• To understand that sensors can be useful in products as they mean the product can function without human input</li> </ul>
	Additional	<ul style="list-style-type: none"> <li>• To understand key developments in thermometer history</li> <li>• 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</li> <li>• To know the 6Rs of sustainability</li> <li>• To understand what a virtual model is and the pros and cons of traditional vs CAD modelling</li> </ul>	<ul style="list-style-type: none"> <li>• To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request</li> <li>• To know that 'multifunctional' means an object or product has more than one function</li> <li>• To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing</li> </ul>