



## Design & Technology Progression of skills - Rec to Y6

	EFYS Skills	Key Stage 1 Skills		Lower Key Stage 2 Skills		Upper Key Stage 2 Skills	
<b>NC Curriculum</b>	<p>Early Learning Goals: - To safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>- Share their creations, explaining the process they have used.</p>	<p><b>Design</b></p> <ul style="list-style-type: none"> <li>- design purposeful, functional, appealing products for themselves and other users based on design criteria</li> <li>- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li>-select from and use a range of tools and equipment to perform practical tasks</li> <li>-select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>-explore and evaluate a range of existing products</li> <li>- evaluate their ideas and products against design criteria</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>-build structures, exploring how they can be made stronger, stiffer and more stable</li> <li>-explore and use mechanisms in their products.</li> </ul> <p><b>Cooking and Nutrition</b></p> <ul style="list-style-type: none"> <li>-use the basic principles of a healthy and varied diet to prepare dishes</li> <li>- understand where food comes from.</li> </ul>		<p><b>Design</b></p> <ul style="list-style-type: none"> <li>- use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</li> <li>-generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> </ul> <p><b>Make</b></p> <ul style="list-style-type: none"> <li>-select from and use a wider range of tools and equipment to perform practical tasks accurately</li> <li>-select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</li> </ul> <p><b>Evaluate</b></p> <ul style="list-style-type: none"> <li>-investigate and analyse a range of existing products</li> <li>-evaluate their ideas and products against their own design criteria and consider the views of others to improve their work</li> <li>- understand how key events and individuals in design and technology have helped shape the world</li> </ul> <p><b>Technical knowledge</b></p> <ul style="list-style-type: none"> <li>-apply their understanding of how to strengthen, stiffen and reinforce more complex structures</li> <li>-understand and use mechanical systems in their products</li> <li>-understand and use electrical systems in their products</li> <li>-apply their understanding of computing to program, monitor and control their products.</li> </ul> <p><b>Cooking and Nutrition</b></p> <ul style="list-style-type: none"> <li>-understand and apply the principles of a healthy and varied diet</li> <li>-prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques</li> <li>-understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.</li> </ul>			
<b>Design</b>	<b>End of REC Expectations</b>	<b>End of Year 1 Expectations</b>	<b>End of Year 2 Expectations</b>	<b>End of Year 3 Expectations</b>	<b>End of Year 4 Expectations</b>	<b>End of Year 5 Expectations</b>	<b>End of Year 6 Expectations</b>
<b>Structures</b>	Look and talk about what they have produced, describing simple techniques and media used.	-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 structure with key features to appeal to a specific person/purpose - Drawing and labelling a product - Design using 2D shapes, labelling: -the 3D shapes that will	• Designing a structure that is aesthetically pleasing and selecting materials to create a desired effect - Building frame structures designed to support weight.	-Designing a structure that is able to support weight. - Creating frame structure with focus on triangulation	-Designing a structure featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.

				create the features, materials and colours. - Designing and/or decorating a product on CAD software.			
<b>Mechanisms/ Mechanical Systems</b>	<ul style="list-style-type: none"> <li>- Begin to use a variety of drawing tools</li> <li>- Use drawings to tell a story</li> <li>- Investigate different lines</li> <li>- Explore different textures</li> <li>- Encourage accurate drawings of people</li> </ul>	<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> <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>- Creating a class design criterion for a moving monster</li> <li>-Designing a moving monster for a specific audience in accordance with a design criteria.</li> <li>-Selecting a suitable linkage system to produce the desired motions</li> <li>- Designing a wheel</li> <li>Selecting appropriate materials based on their properties.</li> </ul>	<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>	<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-workings of the automata.</li> </ul>
<b>Electrical Systems (KS2 Only)</b>	N/A	N/A	N/A	<ul style="list-style-type: none"> <li>-Designing a game that works using static electricity, including the instructions for playing the game.</li> <li>-Identifying a design criteria and a target audience</li> </ul>	<ul style="list-style-type: none"> <li>-Designing an electrical system, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas</li> </ul>	<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</li> <li>- 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>
<b>Cooking and Nutrition</b>		<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>	<ul style="list-style-type: none"> <li>-Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients,</li> </ul>	<ul style="list-style-type: none"> <li>-Designing a biscuit within a given budget, drawing upon previous taste testing</li> </ul>	<ul style="list-style-type: none"> <li>-Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove,</li> </ul>	<ul style="list-style-type: none"> <li>-Writing a recipe, explaining the key steps, method and ingredients</li> </ul>

				considering the taste, texture, smell and appearance of the dish		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	-Including facts and drawings from research undertaken
<b>Textiles</b>	- Handling, feeling, enjoying and manipulating materials - Constructing - Building and destroying -Shape and model	-Using a template to create a design for a puppet	- Designing a pouch	-Designing and making a template from an existing cushion and applying individual design criteria	- Writing design criteria for a product, articulating decisions made -Designing a personalised Book sleeve.	-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 specification linked to set of design criteria to fit a specific theme -Annotating designs
<b>Digital World (KS2 Only)</b>	N/A	N/A	N/A	-Problem solving by suggesting potential features on a Micro: bit and justifying my ideas -Developing design ideas for a technology pouch -Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge	-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, using computer-aided design (CAD), to produce a logo -Following a list of design requirements	-Researching (books, internet) for a particular (user's) animal's needs -Developing design criteria based on research -Generating multiple housing ideas using building bricks -Understanding what a virtual model is and the pros and cons of traditional and CAD modelling -Placing and manoeuvring 3D objects, using CAD -Changing the properties of, or combine 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 combine one or more 3D objects, using CAD
<b>Make</b>	<b>End of REC Expectations</b>	<b>End of Year 1 Expectations</b>	<b>End of Year 2 Expectations</b>	<b>End of Year 3 Expectations</b>	<b>End of Year 4 Expectations</b>	<b>End of Year 5 Expectations</b>	<b>End of Year 6 Expectations</b>
<b>Structures</b>		-Making stable structures from card, tape and glue -Following instructions to cut and assemble the supporting structure of a windmill	-Making a structure according to design criteria - Creating joints and structures from paper/card and tape	-Constructing a range of 3D geometric shapes using nets - Creating special features for individual designs	-Creating a range of different shaped frame structures -Making a variety of free standing frame structures of different shapes and sizes	-Making a range of different shaped beam bridges -Using triangles to create truss bridges that span a given distance and supports a load	-Building a range of play apparatus structures drawing upon new and prior knowledge of structures

		<ul style="list-style-type: none"> <li>-Making functioning turbines and axles which are assembled into a main supporting structure</li> </ul>		<ul style="list-style-type: none"> <li>-Making facades from a range of recycled materials</li> </ul>	<ul style="list-style-type: none"> <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>	<ul style="list-style-type: none"> <li>- Building a wooden bridge structure Independently measuring and marking wood accurately</li> <li>-Selecting appropriate tools and equipment for particular tasks</li> <li>-Using the correct techniques to saw 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>- 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>
<b>Mechanisms/ Mechanical Systems</b>		<ul style="list-style-type: none"> <li>-Following a design to create moving models that use levers and sliders</li> <li>-Adapting mechanisms</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> <li>-Selecting materials according to their characteristics</li> <li>-Following a design brief</li> </ul>	<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>	<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</li> </ul>

							which the glue needs to dry/set
<b>Electrical Systems (KS2 Only)</b>	N/A	N/A	N/A	<ul style="list-style-type: none"> <li>- Making an electrostatic game, referring to the design criteria</li> <li>- Using a wider range of materials and equipment safely</li> <li>- Using electrostatic energy to move objects in isolation as well as in part of a system</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>	<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>
<b>Cooking and Nutrition</b>		<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>	<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>	<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>
<b>Textiles</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> </ul>	<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>• 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 <ul style="list-style-type: none"> <li>• Incorporating fastening to a design</li> </ul> </li> </ul>	<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>• Using applique to attach pieces of fabric decoration</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> </ul>
<b>Digital World (KS2 Only)</b>	N/A	N/A	N/A	<ul style="list-style-type: none"> <li>-Using a template when cutting and assembling the pouch</li> </ul>	<ul style="list-style-type: none"> <li>-Developing a prototype case for my mindful moment timer</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding the functional and aesthetic properties of plastics</li> </ul>	<ul style="list-style-type: none"> <li>Considering materials and their functional properties, especially those that are</li> </ul>

				<ul style="list-style-type: none"> <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>• Creating a 3D structure using a net</li> </ul>		<p>sustainable and recyclable (for example, cork and bamboo)</p> <ul style="list-style-type: none"> <li>• Explaining material choices and why they were chosen as part of a product concept</li> </ul>
<b>Evaluation</b>	<b>End of REC Expectations</b>	<b>End of Year 1 Expectations</b>	<b>End of Year 2 Expectations</b>	<b>End of Year 3 Expectations</b>	<b>End of Year 4 Expectations</b>	<b>End of Year 5 Expectations</b>	<b>End of Year 6 Expectations</b>
<b>Structures</b>		<ul style="list-style-type: none"> <li>• Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't</li> <li>• Suggest points for improvements</li> </ul>	<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>	<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>	<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>
<b>Mechanisms/Mechanical Systems</b>		<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> <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 own designs against design criteria</li> <li>• Using peer feedback to modify a final design</li> <li>• Evaluating different designs</li> <li>• Testing and adapting a design</li> </ul>	<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>	<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>Electrical Systems (KS2 Only)</b>	N/A	N/A	N/A	<ul style="list-style-type: none"> <li>• Learning to give constructive criticism on own work and the work of others</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating electrical products</li> <li>• Testing and evaluating the success</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating a peer's product against design criteria and suggesting modifications that could be</li> </ul>	<ul style="list-style-type: none"> <li>• Testing own and others finished games, identifying what went well and</li> </ul>

				<ul style="list-style-type: none"> <li>• Testing the success of a product against the original design criteria and justifying opinions</li> </ul>	of a final product and taking inspiration from the work of peers	made to improve the reliability or aesthetics of it or to incorporate another type of circuit component <ul style="list-style-type: none"> <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>	making suggestions for improvement <ul style="list-style-type: none"> <li>• Gathering images and information about existing children's toys</li> <li>• Analysing a selection of existing children's toys</li> </ul>
<b>Cooking and Nutrition</b>		<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>	<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>	<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>
<b>Textiles</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>	<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> </ul>	<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>
<b>Digital World (KS2 Only)</b>	N/A	N/A	N/A	<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> </ul>	<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</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> </ul>

					<ul style="list-style-type: none"> <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> </ul>	suggesting ways to make more sustainable choices	<ul style="list-style-type: none"> <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> </ul>
<b>Technical Knowledge</b>	<b>End of REC Expectations</b>	<b>End of Year 1 Expectations</b>	<b>End of Year 2 Expectations</b>	<b>End of Year 3 Expectations</b>	<b>End of Year 4 Expectations</b>	<b>End of Year 5 Expectations</b>	<b>End of Year 6 Expectations</b>
Structures		<ul style="list-style-type: none"> <li>• Describing the purpose of structures, including windmills</li> <li>• Learning how to turn 2D nets into 3D structures</li> <li>• Learning that the shape of materials can be changed to improve the strength and stiffness of structures</li> <li>• Understanding that cylinders are a strong type of structure that are often used for windmills and lighthouses</li> <li>• Understanding that windmill turbines use wind to turn and make the machines inside work</li> <li>• Understanding that axles are used in structures and mechanisms to make parts turn in a circle</li> <li>• Developing awareness of different structures for different purposes</li> </ul>	<ul style="list-style-type: none"> <li>• Identifying natural and man-made structures</li> <li>• Identifying when a structure is more or less stable than another</li> <li>• Knowing that shapes and structures with wide, flat bases or legs are the most stable</li> <li>• Understanding that the shape of a structure affects its strength</li> <li>• Using the vocabulary: strength, stiffness and stability</li> <li>• Knowing that materials can be manipulated to improve strength and stiffness</li> <li>• Building a strong and stiff structure by folding paper</li> </ul>	<ul style="list-style-type: none"> <li>• Identifying features of a castle</li> <li>• Identifying suitable materials to be selected and used for a castle, considering weight, compression, tension</li> <li>• Extending the knowledge of wide and flat based objects are more stable</li> <li>• Understanding the terminology of strut, tie, span, beam</li> <li>• Understanding the difference between frame and shell structure</li> </ul>	<ul style="list-style-type: none"> <li>• Learning what pavilions are and their purpose</li> <li>• Building on prior knowledge of net structures and broadening knowledge of frame structures</li> <li>• Learning that architects consider light, shadow and patterns when designing</li> <li>• Implementing frame and shell structure knowledge</li> <li>• Considering effective and ineffective designs</li> </ul>	<ul style="list-style-type: none"> <li>• Exploring how to create a strong beam Identifying arch and beam bridges and understanding the terms: compression and tension</li> <li>• Identifying stronger and weaker structures</li> <li>• Finding different ways to reinforce structures</li> <li>• Understanding how triangles can be used to reinforce bridges</li> <li>• Articulating the difference between beam, arch, truss and suspension bridges</li> </ul>	<ul style="list-style-type: none"> <li>• Knowing that structures can be strengthened by manipulating materials and shapes</li> <li>• Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans)</li> <li>• Understanding man made and natural structures</li> </ul>

<b>Mechanisms/Mechanical Systems</b>		<ul style="list-style-type: none"> <li>• Learning that levers and sliders are mechanisms and can make things move</li> <li>• Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make</li> <li>• Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement</li> <li>• Identifying what mechanism makes a toy or vehicle roll forwards</li> <li>• Learning that for a wheel to move it must be attached to an axle</li> </ul>	<ul style="list-style-type: none"> <li>• Learning that mechanisms are a collection of moving parts that work together in a machine</li> <li>• Learning that there is an input and output in a mechanism</li> <li>• Identifying mechanisms in everyday objects</li> <li>• Learning that a lever is something that turns on a pivot</li> <li>• Learning that a linkage is a system of levers that are connected by pivots</li> <li>• Exploring wheel mechanisms</li> <li>• Learning how axels help wheels to move a vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding how pneumatic systems work</li> <li>• Learning that mechanisms are a system of parts that work together to create motion</li> <li>• Understanding that pneumatic systems can be used as part of a mechanism</li> <li>• Learning that pneumatic systems force air over a distance to create movement</li> </ul>	<ul style="list-style-type: none"> <li>• Learning that products change and evolve over time</li> <li>• Learning that all moving things have kinetic energy</li> <li>• Understanding that kinetic energy is the energy that something (object person) has by being in motion</li> </ul>	<ul style="list-style-type: none"> <li>• Knowing that an input is the motion used to start a mechanism</li> <li>• Knowing that output is the motion that happens as a result of starting the input</li> <li>• Knowing that mechanisms control movement</li> <li>• Describing mechanisms that can be used to change one kind of motion into another</li> </ul>	<ul style="list-style-type: none"> <li>• Using a bench hook to saw safely and effectively</li> <li>• Exploring cams, learning that different shaped cams produce different follower movements</li> <li>• Exploring types of motions and direction of a motion</li> </ul>
<b>Electrical Systems (KS2 Only)</b>	N/A	N/A	N/A	<ul style="list-style-type: none"> <li>• Understanding what static electricity is and how it moves objects through attraction or repulsion</li> <li>• Generating static electricity independently</li> <li>• Using static electricity to make objects move in a desired way</li> </ul>	<ul style="list-style-type: none"> <li>• Learning how electrical items work</li> <li>• Identifying electrical products</li> <li>• Learning what electrical conductors and insulators are</li> <li>• Understanding that a battery contains stored electricity and can be used to power products</li> <li>• Identifying the features of a torch <ul style="list-style-type: none"> <li>• Understanding how a torch works</li> <li>• Articulating the positives and negatives about different torches</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Learning the key components used to create a functioning circuit</li> <li>• Learning that copper is a conductor and can be used as part of a circuit</li> <li>• Understanding that breaks in a circuit will stop it from working</li> <li>• Explaining how a series circuit will work in my card</li> <li>• Identifying the negative and positive leg of an LED</li> <li>• Drawing a series circuit diagram and symbols</li> </ul>	<ul style="list-style-type: none"> <li>• Learning that batteries contain acid, which can be dangerous if they leak</li> <li>• Identifying and naming the circuit components in a steady hand game</li> </ul>
<b>Cooking and Nutrition</b>		<ul style="list-style-type: none"> <li>• Understanding the difference between fruits and vegetables</li> <li>• Describing and grouping fruits by texture and taste</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding what makes a balanced diet</li> <li>• Knowing where to find the nutritional information on packaging</li> <li>• Knowing the five food groups</li> </ul>	<ul style="list-style-type: none"> <li>• Learning that climate affects food growth</li> <li>• Working with cooking equipment safely and hygienically</li> <li>• Learning that imported foods travel</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits</li> <li>• Understanding the environmental impact</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding where food comes from - learning that beef is from cattle and how beef is reared and processed</li> <li>• Understanding what constitutes a balanced diet</li> <li>• Learning to adapt a recipe to make it healthier</li> </ul>	<ul style="list-style-type: none"> <li>• Learning how to research a recipe by ingredient</li> <li>• Recording the relevant ingredients and equipment needed for a recipe</li> <li>• Understanding the combinations of food</li> </ul>

				<p>from far away and this can negatively impact the environment</p> <ul style="list-style-type: none"> <li>• Learning that vegetables and fruit grow in certain seasons</li> <li>• Learning that each fruit and vegetable gives us nutritional benefits</li> <li>• Learning to use, store and clean a knife safely</li> </ul>	on future product and cost of production	<ul style="list-style-type: none"> <li>• Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option</li> </ul>	that will complement one another <ul style="list-style-type: none"> <li>• Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient</li> </ul>
<b>Textiles</b>		<ul style="list-style-type: none"> <li>• Learning different ways in which to join fabrics together: pinning, stapling, gluing</li> </ul>	<ul style="list-style-type: none"> <li>• Joining items using fabric glue or stitching</li> <li>Identifying benefits of these techniques</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>	<ul style="list-style-type: none"> <li>• Threading needles with greater independence</li> <li>• Tying knots with greater independence</li> <li>• Sewing cross stitch and appliqué</li> <li>• Understanding the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance</li> <li>• Understanding that fabrics can be layered for affect</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding that there are different types of fastenings and what they are</li> <li>• Articulating the benefits and disadvantages of different fastening types</li> </ul>	<ul style="list-style-type: none"> <li>• Learning to sew blanket stitch to join fabric</li> <li>• Applying blanket stitch so the space between the stitches are even and regular</li> <li>• Threading needles independently</li> </ul>	<ul style="list-style-type: none"> <li>• Learning different decorative stitches</li> <li>• Application and outcome of the individual technique</li> <li>• Sewing accurately with even regularity of stitches</li> </ul>
<b>Digital World (KS2 Only)</b>	N/A	N/A	N/A	<ul style="list-style-type: none"> <li>• Identifying key product developments that occurred as a result of the digital revolution</li> <li>• Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm</li> <li>• Understanding what a loop is in programming</li> </ul>	<ul style="list-style-type: none"> <li>• Writing design criteria for a programmed timer (Micro:bit)</li> <li>• Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press</li> <li>• Testing my program for bugs (errors in the code)</li> </ul>	<ul style="list-style-type: none"> <li>• Describing key developments in thermometer history</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> <li>• Explaining key functions in my program (audible alert, visuals)</li> <li>• Explaining how my product would be useful</li> </ul>	<ul style="list-style-type: none"> <li>• Programming an N,E, S,W cardinal compass</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</li> </ul>

				<ul style="list-style-type: none"><li>• Explaining the basic functionality of my eCharm program</li><li>• Understanding what is meant by 'point of sale display'</li></ul>	<ul style="list-style-type: none"><li>• Finding and fixing the bugs (debug) in my code</li></ul>	for an animal carer including programmed features	of my navigation tool to the client as part of a product concept pitch <ul style="list-style-type: none"><li>• Demonstrating a functional program as part of a product concept</li></ul>
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