

# Progression document

	Year group	Year 1	Year 2	Year 3	Year 4		Year 5	Year 6
T E X T I L E S	Design	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	E L E C T R I C A L	Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product Developing design criteria based on finding from investigating existing products Developing design criteria that clarifies the target user	Designing a steady hand game - identifying and naming the components required Drawing a design from three different perspectives Generating ideas through sketching and discussion Modelling ideas through prototypes
	Make	Cutting fabric neatly with scissors Using joining methods to decorate a puppet Sequencing steps for construction	Selecting and cutting fabrics for sewing Threading a needle Sewing running stitch, with evenly spaced, neat, even stitches to join fabric Neatly pinning and cutting fabric using a template	Following design criteria to create a cushion Selecting and cutting fabrics with ease using fabric scissors Threading needles with greater independence Tying knots with greater independence Sewing cross stitch to join fabric Decorating fabric using appliqué	Making and testing a paper template with accuracy and in keeping with the design criteria Measuring, marking and cutting fabric using a paper template Selecting a stitch style to join fabric, working neatly sewing small neat stitches Incorporating fastening to a design		Altering a product's form and function by tinkering with its configuration. Making a functional series circuit, incorporating a motor Constructing a product with consideration for the design criteria	Constructing a stable base for a game Accurately cutting, folding and assembling a net Decorating the base of the game to a high quality finish Making and testing a circuit Incorporating a circuit into a base

			Completing design ideas with stuffing and sewing the edges		SYSTEMS		
Evaluate	Reflecting on a finished product, explaining likes and dislikes	Troubleshooting scenarios posed by teacher	Evaluating an end product and thinking of other ways in which to create similar items	Testing and evaluating an end product against the original design criteria Deciding how many of the criteria should be met for the product to be considered successful Suggesting modifications for improvement Articulating the advantages and disadvantages of different fastening types		Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses Determining which parts of a product affect its function and which parts affect its form Analysing whether changes in configuration positively or negatively affect an existing product	Testing own and others finished games, identifying what went well and making suggestions for improvement
Knowledge	To know that 'joining technique' means connecting two pieces of material together To know that there are various temporary methods of joining fabric by using staples, glue or pins To understand that different techniques for joining materials can be used for	To know that sewing is a method of joining fabric To know that different stitches can be used when sewing To understand the importance of tying a knot after sewing the final stitch To know that a thimble can be used to protect my fingers when sewing	To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric To know that when two edges of fabric have been joined together it is called a seam To know that it is important to leave space on the fabric for the seam	To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and velcro To know that different fastening types are useful for different purposes To know that creating a mock up (prototype) of their	To know that series circuits only have one direction for the electricity to flow To know when there is a break in a series circuit, all components turn off To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin To know a motorised product is one which	To know that batteries contain acid, which can be dangerous if they leak To know the names of the components in a basic series circuit including a buzzer	

		different purposes To understand that a template (or fabric pattern) is used to cut out the same shape multiple times To know that drawing a design idea is useful to see how an idea will look		To understand that some products are turned inside out after sewing so the stitching is hidden	design is useful for checking ideas and proportions		uses a motor to function	
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S T R U C T U R E S	Design	Learning the importance of a clear design criteria Including individual preferences and requirements in a design	Generating and communicating ideas using sketching and modelling	Designing a castle with key features to appeal to a specific person/purpose Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours	Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect Building frame structures designed to support weight	Designing a stable structure that is able to support weight Creating frame structure with focus on triangulation .	Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs
	Make	Making stable structures from card, tape and glue Learning how to turn 2D nets into 3D structures Following instructions to cut and assemble the supporting structure of a windmill Making functioning turbines and axles which are assembled	Making a structure according to design criteria Creating joints and structures from paper/card and tape Building a strong and stiff structure by folding paper	Constructing a range of 3D geometric shapes using nets Creating special features for individual designs Making facades from a range of recycled materials	Creating a range of different shaped frame structures Making a variety of free standing frame structures of different shapes and sizes Selecting appropriate materials to build a strong structure and for the cladding Reinforcing corners to strengthen a structure	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 wooden bridge structure Independently measuring and marking wood	Building a range of play apparatus structures drawing upon new and prior knowledge of structures Measuring, marking and cutting wood to create a range of structures Using a range of materials to reinforce and add decoration to

		into a main supporting structure			Creating a design in accordance with a plan Learning to create different textural effects with materials	accurately Selecting appropriate tools and equipment for particular tasks Using the correct techniques to saws safely Identifying where a structure needs reinforcement and using card corners for support Explaining why selecting appropriating materials is an important part of the design process Understanding basic wood functional properties	structures
<b>Evaluate</b>	Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't Suggest points for improvements	Testing the strength of own structures Identifying the weakest part of a structure Evaluating the strength, stiffness and stability of own structure	Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design Suggesting points for modification of the individual designs	Evaluating structures made by the class Describing what characteristics of a design and construction made it the most effective Considering effective and ineffective designs	Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary Suggesting points for improvements for own bridges and those designed by others	Improving a design plan based on peer evaluation Testing and adapting a design to improve it as it is developed Identifying what makes a successful structure	
<b>Knowledge</b>	To understand that the shape of materials can be changed to improve the strength and stiffness of structures	To know that materials can be manipulated to improve strength and stiffness To know that a	To understand that wide and flat based objects are more stable To understand the	To understand what a frame structure is To know that a 'free-standing' structure is one which	To understand some different ways to reinforce structures To understand how triangles can be used	To know that structures can be strengthened by manipulating	

		<p>To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses)</p> <p>To understand that axles are used in structures and mechanisms to make parts turn in a circle</p> <p>To begin to understand that different structures are used for different purposes</p> <p>To know that a structure is something that has been made and put together</p>	<p>structure is something which has been formed or made from parts</p> <p>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move</p> <p>To know that a 'strong' structure is one which does not break easily</p> <p>To know that a 'stiff' structure or material is one which does not bend easily</p>	<p>importance of strength and stiffness in structures</p>	<p>can stand on its own</p>	<p>to reinforce bridges</p> <p>To know that properties are words that describe the form and function of materials</p> <p>To understand why material selection is important based on their properties</p> <p>To understand the material (functional and aesthetic) properties of wood</p>	<p>materials and shapes</p>
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M E C H A N I	Design	<p>Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move</p> <p>Creating clearly labelled drawings which illustrate movement</p>	<p>Creating a class design criteria for a moving monster</p> <p>Designing a moving monster for a specific audience in accordance with a design criteria</p>	<p>Designing a toy which uses a pneumatic system</p> <p>Developing design criteria from a design brief</p> <p>Generating ideas using thumbnail sketches and exploded diagrams</p> <p>Learning that different types of drawings are used in design to</p>	<p>Designing a shape that reduces air resistance</p> <p>Drawing a net to create a structure from</p> <p>Choosing shapes that increase or decrease speed as a result of air resistance</p> <p>Personalising a design</p>	<p>Designing a pop-up book which uses a mixture of structures and mechanisms</p> <p>Naming each mechanism, input and output accurately</p> <p>Storyboarding ideas for a book</p>	<p>Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement</p> <p>Understanding how linkages change the direction of a force</p> <p>Making things move at the same time</p> <p>Understanding and</p>

S M S				explain ideas clearly			drawing cross-sectional diagrams to show the inner-working
	Make	Adapting mechanisms	<p>Making linkages using card for levers and split pins for pivots</p> <p>Experimenting with linkages adjusting the widths, lengths and thicknesses of card used</p> <p>Cutting and assembling components neatly</p>	<p>Creating a pneumatic system to create a desired motion</p> <p>Building secure housing for a pneumatic system</p> <p>Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy</p> <p>Selecting materials due to their functional and aesthetic characteristics</p> <p>Manipulating materials to create different effects by cutting, creasing, folding, weaving</p>	<p>Measuring, marking, cutting and assembling with increasing accuracy</p> <p>Making a model based on a chosen design</p>	<p>Following a design brief to make a pop up book, neatly and with focus on accuracy</p> <p>Making mechanisms and/or structures using sliders, pivots and folds to produce movement</p> <p>Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result</p>	<p>Measuring, marking and checking the accuracy of the jelutong and dowel pieces required</p> <p>Measuring, marking and cutting components accurately using a ruler and scissors</p> <p>Assembling components accurately to make a stable frame</p> <p>Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles</p> <p>Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set</p>
	Evaluate	Testing mechanisms, identifying what stops wheels from turning, knowing that a wheel needs an axle in order to move	<p>Evaluating own designs against design criteria</p> <p>Using peer feedback to modify a final design</p>	<p>Using the views of others to improve designs</p> <p>Testing and modifying the outcome, suggesting</p>	<p>Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on</p>	<p>Testing a finished product, seeing whether it moves as planned and if not, explaining why and</p>	<p>Evaluating the work of others and receiving feedback on own work</p> <p>Applying points of improvements</p> <p>Describing changes</p>

			<p>improvements</p> <p>Understanding the purpose of exploded-diagrams through the eyes of a designer and their client</p>	performance	how it can be fixed	they would make/do if they were to do the project again
Knowledge	<p>To know that wheels need to be round to rotate and move</p> <p>To understand that for a wheel to move it must be attached to a rotating axle</p> <p>To know that an axle moves within an axle holder which is fixed to the vehicle or toy</p> <p>To know that the frame of a vehicle (chassis) needs to be balanced</p>	<p>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement</p> <p>To know that there is always an input and output in a mechanism</p> <p>To know that an input is the energy that is used to start something working</p> <p>To know that an output is the movement that happens as a result of the input</p> <p>To know that a lever is something that turns on a pivot</p> <p>To know that a linkage mechanism is made up of a series of levers</p>	<p>To understand how pneumatic systems work</p> <p>To understand that pneumatic systems can be used as part of a mechanism</p> <p>To know that pneumatic systems operate by drawing in, releasing and compressing air</p>	<p>To know that air resistance is the level of drag on an object as it is forced through the air</p> <p>To understand that the shape of a moving object will affect how it moves due to air resistance.</p>	<p>To know that mechanisms control movement</p> <p>To understand that mechanisms that can be used to change one kind of motion into another</p> <p>To understand how to use sliders, pivots and folds to create paper-based mechanisms</p>	<p>To understand that the mechanism in an automata uses a system of cams, axles and followers</p> <p>To understand that different shaped cams produce different outputs</p>