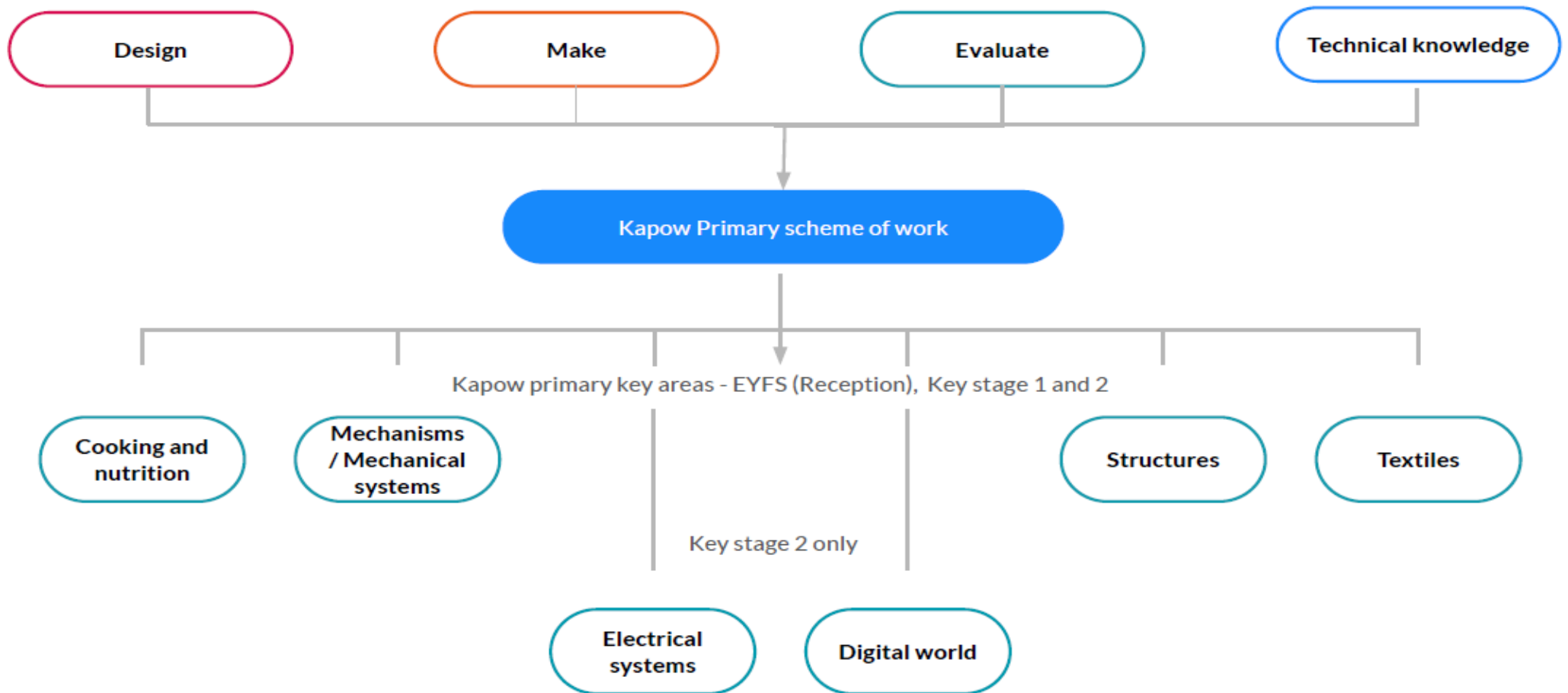






Structures Year A and B

EYFS (Reception and Nursery)			
		Junk Modelling Year B	Boats Year B
Skills	Design	Making verbal plans and material choices. • Developing a junk model.	Designing a junk model boat. • Using knowledge from exploration to inform design.
	Make	Improving fine motor/scissor skills with a variety of materials. • Joining materials in a variety of ways (temporary and permanent). • Joining different materials together. • Describing their junk model, and how they intend to put it together.	Making a boat that floats and is waterproof, considering material choice
	Evaluate	Giving a verbal evaluation of their own and others' junk models with adult support. • Checking to see if their model matches their plan. • Considering what they would do differently if they were to do it again. • Describing their favourite and least favourite part of their model.	Making predictions about, and evaluating different materials to see if they are waterproof. • Making predictions about, and evaluating existing boats to see which floats best. • Testing their design and reflecting on what could have been done differently. • Investigating the how the shapes and structure of a boat affect the way it
Knowledge	Technical	To know there are a range to different materials that can be used to make a model and that they are all slightly different. Making simple suggestions to fix their junk model.	To know that 'waterproof' materials are those which do not absorb water.
	Additional		To know that some objects float and others sink. • To know the different parts of a boat.
Key Stage 1			
		Granny's Chair Year B	London Eye/ Landmarks Year A
Skills	Design	● Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria. ● Creating ideas with design criteria in mind. ● Referring to specific parts of existing products when generating ideas.	Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design.



	Make	Choosing materials, ingredients or components from a wider range of materials, ingredients or components. ● Explaining their choices based on the properties of materials and components. ● Looking for ways to make cutting easier, like turning the material they are cutting, not fully closing scissors etc. ● Choosing known geometric shapes when making. ● Beginning to shape objects to improve how they work.	Making stable structures from card. ● Following instructions to cut and assemble the supporting structure of a windmill. ● Making functioning turbines and axles which are assembled into a main supporting structure. ● Finding the middle of an object. ● Puncturing holes. ● Adding weight to structures. ● Creating supporting structures. ● Cutting evenly and carefully.
	Evaluate	Discussing a range of existing products and saying what they like and dislike about them. Comparing a range of products and explaining why some better meet different design criteria than others. Evaluating their ideas and creations against simple design criteria.	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.
Knowledge	Technical	Recognising that different structures are used for different purposes. ● Exploring the features of structures. ● Making stable structures from card. ● Creating supporting structures to aid stability. ● Using stable objects like cylinders to create structures. ● Building a strong and stiff structure by folding paper. ● Folding to strengthen or stiffen. ● Comparing the stability of different shapes. ● Identifying the weakest part of a structure.	To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). ● To understand that axles are used in structures and mechanisms to make parts turn in a circle. ● To begin to understand that different structures are used for different purposes. ● To know that a structure is something that has been made and put together. ● To know that the sails or blades of a windmill are moved by the wind. ● To know that a structure is something built for a reason. ● To know that stable structures do not topple. ● To know that adding weight to the base of a structure can make it more stable.
	Additional	To know that a design brief helps to decide what to make. ● To know that design criteria are the steps for making a product successful. ● To know that design criteria help when thinking of ideas. ● To know that different products work in different ways and have parts that make them work. ● To know some properties of materials like hard, soft, flexible, waterproof, strong etc. ● To know the names of some geometric shapes, triangle, pyramid, square, cube, circle, sphere. ● To know that existing products can be evaluated against design criteria.	To know that design criteria is a list of points to ensure the product meets the clients needs and wants. ● To know that windmill turbines use wind to turn and make the machines inside work. ● To know that a windmill is a structure with sails that are moved by the wind. ● To know the three main parts of a windmill are the turbine, axle and structure.



		● To know that design criteria help to decide if their product is a success. ● To know that improve means to make something better. ● To know that a structure is something that has been made and put together. ● To know that the shape of a structure affects its strength. ● To know that materials can be manipulated to improve strength and stiffness. ● To know that a 'strong' structure is one which does not break easily. ● To know that a 'stiff' structure or material is one which does not bend easily.	
Year 3 and 4			
		Egyptian Temple Year B	Pavilions Year A
Skills	Design	Designing a temple with key features to appeal to a specific person/purpose. ● Drawing and labelling a castle design using 2D shapes, labelling: - the 3D shapes that will create the features - materials needed and colours. ● Designing and/or decorating the temple on CAD software.	● Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. ● Building frame structures designed to support weight.
	Make	Constructing a range of 3D geometric shapes using nets . ● Creating special features for individual designs. ● Making facades from a range of recycled materials.	Creating a range of different shaped frame structures. ● Making a variety of free standing frame structures of different shapes and sizes. ● Selecting appropriate materials to build a strong structure and cladding. ● Reinforcing corners to strengthen a structure. ● Creating a design in accordance with a plan. ● Learning to create different textural effects with materials.
	Evaluate	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.
Knowledge	Technical	To understand that wide and flat based objects are more stable. ● To understand the importance of strength and stiffness in structures.	● To understand what a frame structure is ● To know that a 'free-standing' structure is one which can stand on its own
	Additional	To know that a façade is the front of a structure. ● To understand that a temple needed to be strong and stable to withstand enemy attack.	To know that a pavilion is a a decorative building or structure for leisure activities.



		- To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. - To know that a design specification is a list of success criteria for a product.	- To know that cladding can be applied to structures for different effects. - To know that aesthetics are how a product looks. - To know that a product's function means its purpose. - To understand that the target audience means the person or group of people a product is designed for. - To know that architects consider light, shadow and patterns when designing.
Year 5 and 6			
		Playgrounds Year B	Bridges Year A
Skills	Design	Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.	- Designing a stable structure that is able to support weight. - Creating a frame structure with a focus on triangulation.
	Make	- 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 structures.	Making a range of different shaped beam bridges. - Using triangles to create truss bridges that span a given distance and support a load. - Building a wooden bridge structure. - Independently measuring and marking wood accurately. - Selecting appropriate tools and equipment for particular tasks. - Using the correct techniques to saws safely. - Identifying where a structure needs reinforcement and using card corners for support. - Explaining why selecting appropriating materials is an important part of the design process. - Understanding basic wood functional properties.
	Evaluate	- 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.	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.
Knowledge	Technical	To know that structures can be strengthened by manipulating materials and shapes	To understand some different ways to reinforce structures. - To understand how triangles can be used to reinforce bridges. - To know that properties are words that describe the form and function of materials. - To understand why material selection is important based on properties. - To understand the material (functional and aesthetic) properties of wood.
	Additional	To understand what a 'footprint plan' is. - To understand that in the real world, design , can impact users in positive and negative ways. - To know that a prototype is a cheap model to test a design idea.	To understand the difference between arch, beam, truss and suspension bridges. To understand how to carry and use a saw safely.



Mechanisms/ Mechanical Systems

Key Stage 1

		Design a vehicle Year B	Levers Year A
Skills	Design	- Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. - Creating clearly labelled drawings that illustrate movement.	- Creating ideas with design criteria in mind. - Referring to specific parts of existing products when generating ideas. - Using labels to explain parts of a design, label materials etc, including using ICT. - Integrating moving parts when creating mock-ups.
	Make	- Adapting mechanisms, when: - they do not work as they should. - to fit their vehicle design. - to improve how they work after testing their vehicle.	- Integrating moving parts when creating mock-ups. - Planning more than one step ahead. - Choosing materials or components from a wider range of materials or components. - Choosing between pieces of equipment that are used for the same purpose (e.g. joining) and explaining why their choice suits the task. - Explaining their choices based on the properties of materials and components. - Following and recalling simple safety instructions.
	Evaluate	Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.	- Discussing whether they were able to use the tools and techniques effectively. - Comparing a range of products and explaining why some better meet different design criteria than others. - Evaluating their ideas and creations against simple design criteria.
Knowledge	Technical	- To know that wheels need to be round to rotate and move. - To understand that for a wheel to move it must be attached to a rotating axle. - To know that an axle moves within an axle holder which is fixed to the vehicle or toy. - To know that the frame of a vehicle (chassis) needs to be balanced	- Recognising and exploring everyday objects that have mechanisms. - Exploring everyday objects that use levers (e.g scissors, tongs, door handle, stapler).
	Additional		- To know that different products work in different ways and have parts that make them work. - To know drawings can help explain how something works. - To know many things that move have parts inside to help make them work. - To know some properties of materials, e.g., hard, soft, flexible, waterproof, strong, etc.



			- To know some pieces of equipment are better suited to certain jobs. - To know some tools are sharp like scissors and knives. - To know following instructions helps with safety. - To know many things that move have parts inside to help them work. - To know mechanisms usually limit unwanted movement. - To know a pivot is the part that a lever moves around.
Year 3 and 4			
		Mechanism's Pneumatic Chariots Year B	Mechanical cars Year A
Skills	Design	- Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. - Taking part in structured idea blasting sessions. - Coming up with more ideas and considering the feasibility of their ideas in the classroom. - Developing drawing and sketching skills with a focus on clarity and simplicity. - Developing designs by adding detail and justifications about materials, tools, methods. - Beginning to recognise the benefit of a range of diagram types or prototypes to communicate ideas. (eg. sketches, cross-sectional diagram, thumbnail sketches and exploded diagrams)	- Taking part in structured brainstorming sessions. - Developing drawing and sketching skills with a focus on clarity and simplicity. - Beginning to recognise the benefit of a range of diagram types or prototypes to communicate ideas. (eg. sketches, cross-sectional diagram, thumbnail sketches and exploded diagrams) - Creating prototypes using materials with similar properties to their final design. - Creating simple design criteria that outline basic functionality and appeal to individual users or target audiences. - Developing designs by adding detail and justifications about materials, tools, methods.
	Make	- Selecting equipment required for a series of tasks based on the plan. Explain why each piece is suitable for each stage. - Suggesting simple safety rules based on their understanding of tool dangers. - Participating in discussions about classroom safety procedures. - Cutting out more complex shapes accurately. - Handle different sizes and types of scissors with confidence. - Using PVA glue to join corrugated card and light wood (e.g. balsa wood). - Choosing shapes to suit the function of a product. - Painting or colouring precisely to improve the finish. - Making facades from a range of materials. - Sealing edges with tape to cover gaps in joins.	- Following detailed safety instructions. - Using a ruler as a measuring tool with increasing accuracy by creating spaced marks using millimetres and measuring lengths of objects. - Handle different sizes and types of scissors with confidence. - With close supervision using a hot glue gun to join wooden materials (e.g. lolly sticks). - Selecting equipment required for a series of tasks based on the plan. Explain why each piece is suitable for each stage. - Selecting materials, components or ingredients from a wider choice but within a limited design space (e.g. seasonal ingredients from May)
	Evaluate	- Analysing why specific products, designers or inventors are successful. - Evaluating their designs by comparing them against design criteria and considering feedback from peers to suggest improvements. - Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements.	- Explaining why they think certain aspects of a peer's design are effective or why they suggested specific improvements. - Reflecting on feedback to decide if and how it could be used to improve future iterations. - Investigating and analysing a range of existing products by looking at their functionality and appeal.



		Reflecting on feedback to decide if and how it could be used to improve future iterations	- Analysing why specific products, designers or inventors are successful. - Evaluating their designs by comparing them against design criteria and considering feedback from peers to suggest improvements. - Evaluating how effective their chosen materials and tools were in fulfilling the design brief.
Knowledge	Technical	- Beginning to understand how mechanisms work. - Recognising pneumatic systems in everyday objects (e.g. car boot, adjustable chair.)	- To understand that a mechanical system can allow us to move something more easily. - To know that mechanical systems have more than one mechanism that moves to make them work. - To know that mechanical systems are often hidden in products to make them look more appealing.
	Additional	- To know that a problem or need is something that a designer can help to solve. - To know that extra information on drawings or diagrams can help the user understand a design or idea. - To know that thumbnail sketches are less detailed quick sketches. - To know that a cross-sectional diagram shows the inside of a product. - To know that an exploded diagram shows how the parts of a product fit together. - To know that different pieces of equipment will be used at different stages in a plan. - To know that different tools and equipment have different dangers. - To know that scissors are useful for cutting out complex shapes. - To know that designers and inventors create products. - To know that choices of materials and equipment can affect the final product. - To know that feedback is ideas and suggestions from other people that can help improve their work. - To know that they can choose to use feedback or not. - To understand that a mechanical system can allow us to move something more easily. - To know that mechanical systems have more than one mechanism that moves to make them work. - To know that mechanical systems are often hidden in products to make them look more appealing. - To know that pushing air can be used to move a mechanism. - To know that pivots can be used to create more movement in the mechanical system. - To know that a combination of mechanisms can improve a product.	- To know that extra information on drawings or diagrams can help the user understand a design or idea. - To know that an exploded diagram shows how the parts of a product fit together. - To know that a prototype is a detailed model that helps a user understand how a product will work. - To know that a target audience is a group of people that might like the idea. - To know that different tools and equipment have different dangers. - To know that a ruler can be used to measure length. - To know that a hot glue gun can be used to join materials. - To know that better suggestions of improvements mean better feedback. - To know that they can choose to use feedback or not. - To know that some products are more successful than other because of their function. - To know that choices of materials and equipment can affect the final product. - To know that feedback is ideas and suggestions from other people that can help improve their work
Year 5 and 6			
		Mechanical – Automata Toys Year B	Mechanism's –Pop up book Year A



Skills	Design	- Noticing wider-reaching problems or needs in the community. - Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. - Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design.	- Noticing wider-reaching problems or needs in the community. - Identifying a wide range of needs and potential barriers through market research. - Writing more complex problem statements that consider multiple factors and constraints. - Creating more complex design criteria that require considering detailed user needs, environmental impact, materials and cost. - Coming up with a broader range of ideas and deeper innovation, requiring pupils to think critically about their ideas' practicality and originality. - Beginning to use more complex annotated sketches, such as cross-sectional and exploded diagrams and pattern pieces in design. - Using a series of prototypes to refine and improve their designs.
	Make	- Producing lists of equipment, materials and tools that they need for a task. - Selecting materials, components or ingredients based on research or user needs. - Explaining their choices, referring to their research. - Considering which equipment will work well together. - Choosing from the known range of equipment available to them with little guidance. - Assessing risks associated with different tools and equipment. - Understanding and explaining the importance of each safety rule. - Consistently apply safety instructions. - Cutting jelutong or other harder wood with a coping saw or a tenon saw in small groups. - Cutting in a back-and-forth sawing motion where appropriate. - In supervised groups, using hot glue guns safely. - Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly	- Consistently apply safety instructions. - Select appropriate scissors to handle delicate cutting tasks and challenging materials. - Cutting patterns and drawings accurately. - In supervised groups, using hot glue guns safely. - Recognising that hot glue is useful for joining materials that need a strong bond that sets quickly. - Choosing PVA glue over hot glue for its safety when joining materials in less intensive projects
	Evaluate	- Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. - Providing feedback that is helpful, specific and encouraging. - Incorporating feedback from peers or users to improve their product further, explaining the changes they made and the impact they had.	- Reflecting on the usability, aesthetics, innovation and sustainability of products and discussing how design choices impact these aspects. - Assessing their designs against a more complex set of design criteria that includes functionality, aesthetics, user experience, sustainability and cost. - Considering alternative materials, tools or techniques that could enhance the product. - Providing feedback that is helpful, specific, and encouraging. - Incorporating feedback from peers or users improve their product further, explaining the changes they made and the impact they had.
Knowledge	Technical	- To know that the mechanism in an automata uses a system of cams, axles and followers. - To know that different shaped cams produce different outputs.	- That mechanical systems that use gears in everyday objects (eg bicycle, clock). - That gears and pulleys allow us to transfer movement and force from one part of a mechanical system to another.



		- To know which mechanisms are working together to make a mechanical system. - To know that there are different directions of movement. - To know that mechanisms can change one type of movement to another	That gears allow us to increase the output of a mechanism.
	Additional	- To know that an automata is a hand powered mechanical toy. - To know that a cross-sectional diagram shows the inner workings of a product.	- That market research is a way of collecting information about problems or needs. - That constraints are things that might stop our ideas being successful. - That original and innovative ideas are different from what has been made before. - That annotations are detailed labels and comments on diagrams. - That risks are things that might happen. - That hot glue creates a strong bond quickly. - That is often better to choose safer equipment. - That sustainability means thinking about the materials that were used to make a product and how the product was made. - That their final product can still be improved by different materials or techniques. - That evaluating their designs in detail will help them understand its successful and less successful parts. - That feedback should be positive, helpful and specific. - That explaining how they used feedback to improve their design can help them create better products in the future.

Textiles

EYFS

Bookmarks Year B

Skills	Design	Discussing what a good design needs. - Designing a simple pattern with paper. - Designing a bookmark. - Choosing from available materials	
	Make	Developing fine motor/cutting skills with scissors. - Exploring fine motor/threading and weaving (under, over technique) with a variety of materials. - Using a prepared needle and wool to practise threading.	
	Evaluate	Reflecting on a finished product and comparing to their design.	
Knowledge	Technical	To know that a design is a way of planning our idea before we start. To know that threading is putting one material through an object.	
	Additional		

Year 1 and 2

Pouches Year B

Puppets Year A



Skills	Design	Designing a pouch	- Stating what they intend to make and why - identifying the purpose. - Talking about ideas, with purpose and user in mind. - Using basic drawing skills to communicate ideas.
	Make	Selecting and cutting fabrics for sewing. - Decorating a pouch using fabric glue or running stitch. - Threading a needle. - Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. - Neatly pinning and cutting fabric using a template.	- Choosing between a small number of materials, ingredients or components. - Explaining their choices based on personal experiences. - Explaining in simple terms why certain tools must be handled carefully. - Following and recalling simple safety instructions. - Using a straightedge to draw a straight line. - Beginning to use objects with a fixed width or length to create even spacing of - markings or cuts. (e.g. a lolly stick). - Using a large plastic needle and large-weave embroidery fabric to begin to create - a running stitch. - Applying masking tape to fix something in place or join to edges. - Adding texture to create visual interest.
	Evaluate	Troubleshooting scenarios posed by the teacher. - Evaluating the quality of the stitching on others' work. - Discussing as a class the success of their stitching against the success criteria. - Identifying aspects of their peers' work that they particularly like and explaining why.	- Saying what they like about their peers' designs and products. - Accepting feedback and understanding it is meant to improve their work.
Knowledge		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 '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 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.
Year 3 and 4			
		Cushion Year B	Fastening – create a book sleeve Year A
Skills	Design	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.
	Make	Following design criteria to create a cushion or Egyptian collar. Selecting and cutting fabrics with ease using fabric scissors.	Making and testing a paper template with accuracy and in keeping with the design



		• Threading needles with greater independence. • Tying knots with greater independence. • Sewing cross stitch to join fabric. • Decorating fabric using appliqué. • Completing design ideas with stuffing and sewing the edges (Cushions) <i>or</i> embellishing the collars based on design ideas (Egyptian collars).	criteria. • Measuring, marking and cutting fabric using a paper template. • Selecting a stitch style to join fabric. • Working neatly by sewing small, straight stitches. • Incorporating a fastening to a design.
	Evaluate	• 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.
Knowledge		To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. • To know that when two edges of fabric have been joined together it is called a seam. • To know that it is important to leave space on the fabric for the seam. • To understand that some products are turned inside out after sewing so the stitching is hidden.	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 design is useful for checking ideas and proportions.
Year 5 and 6			
		Waistcoat Year B	Stuffed toys Year A
Skills	Design	Designing a waistcoat in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions.	Designing a stuffed toy, considering the main component shapes required and creating an appropriate template. • Considering the proportions of individual components.
	Make	Using a template when cutting fabric to ensure they achieve the correct shape. • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design. • Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating a waistcoat, attaching features (such as appliqué) using thread.	Creating a 3D stuffed toy from a 2D design. • Measuring, marking and cutting fabric accurately and independently . • Creating strong and secure blanket stitches when joining fabric. • Threading needles independently. • Using appliqué to attach pieces of fabric decoration. • Sewing blanket stitch to join fabric. • Applying blanket stitch so the spaces between the stitches are even and regular.



		• Finishing the waistcoat with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches.	
	Evaluate	• Reflecting on their work continually throughout the design, make and evaluate process.	Testing and evaluating an end product and giving point for further improvements
	Technical	• Using pins effectively to secure a template to fabric without creases or bulges. • Threading needles independently. • Tying knots at the end of thread to secure it. • Selecting textiles and buttons to improve aesthetics and function. • Attaching objects like buttons using thread.	
Knowledge		To understand that it is important to design clothing with the client/target customer in mind. • To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches.	To know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric. • To understand that it is easier to finish simpler designs to a high standard. • To know that soft toys are often made by creating appendages separately and then attaching them to the main body. • To know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing