



Grange Park School

Learning for Life - Personalised Pathways for All

Medium Term Plan - DT
Year 5/6 - Cycles A & B
Cycle A September 2023

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Cycle A		<p>Mechanical systems: Making a pop-up book</p> <p>Lesson 1 I can design a pop-up book</p> <p>Lesson 2 I can follow my design brief to make my pop up book</p> <p>Lesson 3 I can use layers and spacers to cover the working of mechanisms</p> <p>Lesson 4 I can create a high-quality product suitable for a target user</p>		<p>Textiles: Stuffed toys</p> <p>Lesson 1 I can design a stuffed toy</p> <p>Lesson 2 I can sew blanket stitch</p> <p>Lesson 3 I can create and add decorations to fabric</p> <p>Lesson 4 I can use a blanket stitch to assemble the components of a stuffed toy</p>		<p>Electrical systems: Doodlers</p> <p>Lesson 1 I can understand how motors are used in electrical products.</p> <p>Lesson 2 I can investigate an existing product to determine the factors that affect the product's form and function.</p> <p>Lesson 3 I can put findings from research into practice to develop an</p>

						improved product. Lesson 4 I can develop a DIY kit for another individual to assemble their product.
Hook	See links below for individual lesson plans		Assessment	Creation and evaluation of final pieces.		
Cycle B	Structure: Bridges Lesson 1 I can explore how to reinforce a beam (structure) to improve its strength Lesson 2 I can build a spaghetti truss bridge Lesson 3		Textiles: Waistcoats Lesson 1 I can design a waistcoat Lesson 2 I can mark and cut fabric according to a design Lesson 3 I can assemble a waistcoat		Electrical systems: Steady hand game Lesson 1 I can research and analyse a range of children's toys Lesson 2 I can design a steady hand game Lesson 3	

	<p>I can build a wooden truss bridge</p> <p>Lesson 4 I can complete, reinforce and evaluate my truss bridge</p>		<p>Lesson 4 I can decorate a waistcoat</p>		<p>I can construct a stable base</p> <p>Lesson 4 I can assemble electronics and complete an electronic game</p>	
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Cycle A DT Knowledge and Skills

Term 2 Mechanical systems: Making a pop-up book

	Unit Outcomes	Key Knowledge
	<p>Pupils who are secure will be able to:</p> <ul style="list-style-type: none"> ❖ Produce a suitable plan for each page of their book. ❖ Produce the structure of the book. ❖ Assemble the components necessary for all their structures/mechanisms. ❖ Hide the mechanical elements with more layers using spacers where needed. ❖ Use a range of mechanisms and structures to illustrate their story and make it interactive for the users. ❖ Use appropriate materials and captions to illustrate the story. 	<p>Key Knowledge Pupils who are secure will know:</p> <ul style="list-style-type: none"> ❖ o know that mechanisms control movement. ❖ To understand that mechanisms can be used to change one kind of motion into another. ❖ To understand how to use sliders, pivots and folds to create paper-based mechanisms. ❖ To know that a design brief is a description of what I am going to design and make. ❖ To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.



	Key Vocabulary		Resources
	Design Input Motion Mechanism	Criteria Research Reinforce model	<u>Lessons 1-4</u> <u>Assessment resources</u> <u>Knowledge Organisers</u> <u>Assessment Tracker</u>
	Key Skills		
	<ul style="list-style-type: none"> ❖ Designing a pop-up book which uses a mixture of structures and mechanisms. ❖ Naming each mechanism, input and output accurately. ❖ Storyboarding ideas for a book. ❖ Following a design brief to make a pop up book, neatly and with focus on accuracy. ❖ Making mechanisms and/or structures using sliders, pivots and folds to produce movement. ❖ Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. ❖ Evaluating the work of others and receiving feedback on own work. ❖ Suggesting points for improvement. 		

Cycle A DT Knowledge and Skills

Term 4 Textiles: Stuffed toys

Unit Outcomes		Key Knowledge
Pupils who are secure will be able to: <ul style="list-style-type: none"> ❖ Design a stuffed toy, considering the main component shapes of their toy. ❖ Create an appropriate template for their stuffed toy. ❖ Join two pieces of fabric using a blanket stitch. ❖ Neatly cut out their fabric. ❖ Use appliqué or decorative stitching to decorate the front of their stuffed toy. ❖ Use blanket stitch to assemble their stuffed toy, repairing when needed. ❖ Identify what worked well and areas for improvement. 		Key Knowledge Pupils who are secure will know: <ul style="list-style-type: none"> ❖ 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 securely.
Key Vocabulary		Resources
accurate annotate appendage blanket-stitch design criteria detail evaluation	fabric sew shape stuffed toy stuffing template	<u>Lessons 1-4</u> <u>Assessment resources</u> <u>Knowledge Organisers</u> <u>Assessment Tracker</u>
Key Skills		
<ul style="list-style-type: none"> ❖ Designing a stuffed toy considering the main component shapes required and creating an appropriate template. ❖ Considering the proportions of individual components. 		



- ❖ 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.
- ❖ Testing and evaluating an end product and giving points for further improvements.



Cycle A DT Knowledge and Skills

Term 6 Electrical systems: Doodlers

Unit Outcomes	Key Knowledge
<p>Pupils who are secure will be able to:</p> <ul style="list-style-type: none"> ❖ Identify simple circuit components (battery, bulb and switch) with a basic explanation of their function. ❖ Explain that a series circuit is assembled in a loop to allow the electricity to flow along one path. ❖ Describe a motor as a circuit component that changes electrical energy into movement. ❖ Provide examples of motorised products that use movement to rotate or spin different parts. ❖ Remove and replace different parts of a Doodler, as part of a team. ❖ Suggest ways to switch the configuration to amend the form or function of the Doodler. ❖ Explain, in an investigation report, each of the changes they made and the effect this had on the Doodler's ability to draw scribbles (function) and appearance (form). ❖ Develop design criteria with consideration for the target user, the purpose of their Doodler, a key function and the Doodler's form and final appearance (e.g. fun, bright, soft). ❖ Explain simply why their Doodler has a certain configuration based on the findings of their investigation (e.g. I used four pens because the Doodler would fall over with two). ❖ Create a functional Doodler that creates scribbles on paper with or without a switch. ❖ Identify and list each of the required materials, tools and circuit components required to build a Doodler. ❖ Explain simply the steps to assemble a Doodler as part of a set of instructions (or storyboard). 	<p>Key Knowledge Pupils who are secure will know:</p> <ul style="list-style-type: none"> ❖ To know that, in a series circuit, electricity only flows in one direction. ❖ 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 uses a motor to function.



	<ul style="list-style-type: none"> ❖ Write instructions to build a functional circuit, explaining how to identify if it is functional or not. ❖ Provide suggestions to improve a peer's set of instructions after testing how effective they are at guiding someone. 	
Key Vocabulary		Resources
	circuit component configuration current develop DIY Investigate	Motor Motorised problem solve product analysis series circuit Stable target user
<u>Lessons 1-4</u> <u>Assessment resources</u> <u>Knowledge Organisers</u> <u>Assessment Tracker</u>		
Key Skills		
	<ul style="list-style-type: none"> ❖ Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. ❖ Developing design criteria based on findings from investigating existing products. ❖ Developing design criteria that clarifies the target user. ❖ 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. ❖ Breaking down the construction process into steps so that others can make the product. ❖ Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. ❖ Determining which parts of a product affect its function and which parts affect its form. ❖ Analysing whether changes in configuration positively or negatively affect an existing product. ❖ Peer evaluating a set of instructions to build a product. 	



Cycle B DT Knowledge and Skills

Term 1 Structure: Bridges

Unit Outcomes		Key Knowledge
<p>Pupils who are secure will be able to:</p> <ul style="list-style-type: none"> ❖ Identify stronger and weaker shapes. ❖ Recognise that supporting shapes can help increase the strength of a bridge, allowing it to hold more weight. ❖ Identify beam, arch and truss bridges and describe their differences. ❖ Use triangles to create simple truss bridges that support a load (weight). ❖ Cut beams to the correct size, using a cutting mat. ❖ Smooth down any rough cut edges with sandpaper. ❖ Follow each stage of the truss bridge creation as instructed by their teacher. ❖ Complete a bridge, with varying ranges of accuracy and finish, supported by the teacher. ❖ Identify some areas for improvement, reinforcing their bridges as necessary. 		<p>Key Knowledge Pupils who are secure will know:</p> <ul style="list-style-type: none"> ❖ 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 their properties. ❖ To understand the material (functional and aesthetic) properties of wood.
Key Vocabulary		Resources
beam bridge arch bridge truss bridge strength technique corrugation lamination stiffness	mark out hardwood softwood wood file/rasp sandpaper/glasspaper bench hook/vice tenon saw/coping saw assemble	<p><u>Lessons 1-4</u></p> <p><u>Assessment resources</u></p> <p><u>Knowledge Organisers</u></p>



	rigid factors stability visual appeal aesthetics joints	material properties reinforce wood sourcing evaluate quality of finish accuracy	<u>Assessment Tracker</u>
Key Skills			
	<ul style="list-style-type: none"> ❖ Designing a stable structure that is able to support weight. ❖ Creating a frame structure with focus on triangulation. ❖ 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 saw safely. ❖ Identifying where a structure needs reinforcement and using card corners for support. ❖ Explaining why selecting appropriate materials is an important part of the design process. ❖ Understanding basic wood functional properties. ❖ 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. 		

Cycle B DT Knowledge and Skills

Term 3 Textiles: Waistcoats

Unit Outcomes		Key Knowledge		
	<p>Pupils who are secure will be able to:</p> <ul style="list-style-type: none"> ❖ Consider a range of factors in their design criteria and use this to create a waistcoat design. ❖ Use a template to mark and cut out a design. ❖ Use a running stitch to join fabric to make a functional waistcoat. ❖ Attach a secure fastening, as well as decorative objects. ❖ Evaluate their final product. 	<p>Key Knowledge Pupils who are secure will know:</p> <ul style="list-style-type: none"> ❖ 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. 		
Key Vocabulary		Resources		
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center; padding: 10px;"> annotate decorate design criteria fabric </td> <td style="width: 50%; text-align: center; padding: 10px;"> target customer waistcoat waterproof </td> </tr> </table>	annotate decorate design criteria fabric	target customer waistcoat waterproof	<p><u>Lessons 1-4</u></p> <p><u>Assessment resources</u></p> <p><u>Knowledge Organisers</u></p> <p><u>Assessment Tracker</u></p>
annotate decorate design criteria fabric	target customer waistcoat waterproof			
Key Skills				
	<ul style="list-style-type: none"> ❖ Designing a waistcoat in accordance with a specification and design criteria to fit a specific theme. ❖ Annotating designs. ❖ Using a template when pinning panels onto fabric. ❖ Marking and cutting fabric accurately, in accordance with a design. ❖ Sewing a strong running stitch, making small, neat stitches and following the edge. ❖ Tying strong knots. ❖ Decorating a waistcoat - attaching objects using thread and adding a secure fastening. 			



- ❖ Learning different decorative stitches.
- ❖ Sewing accurately with even regularity of stitches.
- ❖ Evaluating work continually as it is created.



Cycle B DT Knowledge and Skills

Term 5 Electrical systems: Steady hand game

	Unit Outcomes		Key Knowledge
	<p>Pupils who are secure will be able to:</p> <ul style="list-style-type: none"> ❖ Explain simply what is meant by 'form' (the shape of a product) and 'function' (how a product works). ❖ State what they like or dislike about an existing children's toy and why. ❖ Learn about skills developed through play and apply this knowledge in a survey of one or more children's toys. ❖ Identify the components of a steady hand game. ❖ Design a steady hand game of their own according to their design criteria, using four different perspective drawings. ❖ Create a secure base for their game, with neat edges, that relates to their design. ❖ Make and test a functioning circuit and assemble it within a case. 		<p>Key Knowledge Pupils who are secure will know:</p> <ul style="list-style-type: none"> ❖ To know that 'form' means the shape and appearance of an object. ❖ To know the difference between 'form' and 'function'. ❖ To understand that 'fit for purpose' means that a product works how it should and is easy to use. ❖ To know that 'form over purpose' means that a product looks good but does not work very well. ❖ To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind. ❖ To understand the diagram perspectives 'top view', 'side view' and 'back'.
	Key Vocabulary		Resources
	assemble battery battery pack benefit bulb bulb holder buzzer circuit circuit symbol component	design design criteria evaluation fine motor skills fit for purpose form function gross motor skills insulator LED	<p><u>Lessons 1-4</u></p> <p><u>Assessment resources</u></p> <p><u>Knowledge Organisers</u></p> <p><u>Assessment Tracker</u></p>



	conductor copper	user	
	Key Skills		
	<ul style="list-style-type: none">❖ Designing a steady hand game, identifying and naming the components required.❖ Drawing a design from three different perspectives.❖ Generating ideas through sketching and discussion.❖ Modelling ideas through prototypes.❖ Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.❖ 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.❖ Testing their own and others' finished games, identifying what went well and making suggestions for improvement.❖ Gathering images and information about existing children's toys.❖ Analysing a selection of existing children's toys.		