

## St Philip's KS2 D and T Skills Progression Map



Structures	Year 3	Year 4	Year 5	Year 6
Design: Constructing a Castle (Y3) Pavilions (Y4) Bridges (Y5) Playgrounds (Y6)	<ul style="list-style-type: none"> <li>• Designing a castle with key features to appeal to a specific person/purpose.</li> <li>• Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours.</li> <li>• Designing and/or decorating a castle tower on CAD software.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.</li> <li>• Building frame structures designed to support weight.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a stable structure that is able to support weight.</li> <li>• Creating a frame structure with a focus on triangulation.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.</li> </ul>
Make: Constructing a Castle (Y3) Pavilions (Y4) Bridges (Y5) Playgrounds (Y6)	<ul style="list-style-type: none"> <li>• Constructing a range of 3D geometric shapes using nets.</li> <li>• Creating special features for individual designs.</li> <li>• Making facades from a range of recycled materials.</li> </ul>	<ul style="list-style-type: none"> <li>• Creating a range of different shaped frame structures.</li> <li>• Making a variety of free standing frame structures of different shapes and sizes.</li> <li>• Selecting appropriate materials to build a strong structure and 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>• Making a range of different shaped beam bridges.</li> <li>• Using triangles to create truss bridges that span a given distance and support a load.</li> <li>• Building a wooden bridge structure.</li> <li>• Independently measuring and marking wood accurately.</li> <li>• Selecting appropriate tools and equipment for particular tasks.</li> <li>• Using the correct techniques to saws safely.</li> <li>• Identifying where a structure needs reinforcement and using card corners for support.</li> <li>• Explaining why selecting appropriating materials is an important part of the design process.</li> <li>• Understanding basic wood functional properties.</li> </ul>	<ul style="list-style-type: none"> <li>• Building a range of play apparatus structures drawing upon new and prior knowledge of structures.</li> <li>• Measuring, marking and cutting wood to create a range of structures.</li> <li>• Using a range of materials to reinforce and add decoration to structures.</li> </ul>

<p>Evaluate: Constructing a Castle (Y3) Pavilions (Y4) Bridges (Y5) Playgrounds (Y6)</p>	<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>
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<b>Mechanisms/Mechanical Systems</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<p>Design: Pneumatic Toys (Y3) Making a Slingshot Car (Y4) Pop Up Book (Y5) Automata Toys (Y6)</p>	<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 my design.</li> </ul>
<p>Make: Pneumatic Toys (Y3) Making a Slingshot Car (Y4) Pop Up Book (Y5) Automata Toys (Y6)</p>	<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,</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> </ul>

	folding and weaving.			<ul style="list-style-type: none"> <li>• Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.</li> </ul>
Evaluate: Pneumatic Toys (Y3) Making a Slingshot Car (Y4) Pop Up Book (Y5) Automata Toys (Y6)	<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 improvement to their toys.</li> <li>• Describing changes they would make/do if they were to do the project again.</li> </ul>

<b>Electrical Systems</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
Design: Electric Poster (Y3) Torches (Y4) Doodlers (Y5) Steady Hand Game (Y6)	<ul style="list-style-type: none"> <li>• Carry out research based on a given topic (e.g. The Romans) to develop a range of initial ideas.</li> <li>• Generate a final design for the electric poster with consideration to the client's needs and design criteria.</li> <li>• Design an electric poster that fits the requirements of a given brief.</li> <li>• Plan the positioning of the bulb (circuit component) and its purpose.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.</li> <li>• Developing design criteria based on findings from investigating existing products.</li> <li>• Developing design criteria that clarifies the target user.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a steady hand game - identifying and naming the components required.</li> <li>• Drawing a design from three different perspectives.</li> <li>• Generating ideas through sketching and discussion.</li> <li>• Modelling ideas through prototypes.</li> <li>• Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.</li> </ul>
Make: Electric Poster (Y3) Torches (Y4) Doodlers (Y5) Steady Hand Game (Y6)	<ul style="list-style-type: none"> <li>• Create a final design for the electric poster.</li> <li>• Mount the poster onto corrugated card to improve its strength and allow it to withstand the weight of the circuit on the rear.</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>• Altering a product's form and function by tinkering with its configuration.</li> <li>• Making a functional series circuit, incorporating a motor.</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.</li> </ul>

	<ul style="list-style-type: none"> <li>• Measure and mark materials out using a template or ruler.</li> <li>• Fit an electrical component (bulb).</li> <li>• Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).</li> </ul>		<ul style="list-style-type: none"> <li>• Constructing a product with consideration for the design criteria.</li> <li>• Breaking down the construction process into steps so that others can make the product.</li> </ul>	<ul style="list-style-type: none"> <li>• Incorporating a circuit into a base.</li> </ul>
<p>Evaluate: Electric Poster (Y3) Torches (Y4) Doodlers (Y5) Steady Hand Game (Y6)</p>	<ul style="list-style-type: none"> <li>• Learning to give and accept constructive criticism on own work and the work of others.</li> <li>• Testing the success of initial ideas against the design criteria and justifying opinions.</li> <li>• Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluating electrical products.</li> <li>• Testing and evaluating the success of a final product.</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.</li> <li>• Determining which parts of a product affect its function and which parts affect its form.</li> <li>• Analysing whether changes in configuration positively or negatively affect an existing product.</li> <li>• Peer evaluating a set of instructions to build a product.</li> </ul>	<ul style="list-style-type: none"> <li>• Testing own and others finished games, identifying what went well and making suggestions for improvement.</li> <li>• Gathering images and information about existing children's toys.</li> <li>• Analysing a selection of existing children's toys.</li> </ul>

<b>Cooking and Nutrition</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<p>Design: Eating seasonally (Y3) Adapting a recipe (Y4) What could be healthier? (Y5) Come dine with me (Y6)</p>	<ul style="list-style-type: none"> <li>• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.</li> </ul>	<ul style="list-style-type: none"> <li>• Designing a biscuit within a given budget, drawing upon previous taste testing judgements.</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, substitute or add additional ingredients.</li> <li>• Writing an amended method for a recipe to incorporate the relevant changes to ingredients.</li> <li>• Designing appealing packaging to reflect a recipe.</li> </ul>	<ul style="list-style-type: none"> <li>• Writing a recipe, explaining the key steps, method and ingredients.</li> <li>• Including facts and drawings from research undertaken.</li> </ul>

<p>Make: Eating seasonally (Y3) Adapting a recipe (Y4) What could be healthier? (Y5) Come dine with me (Y6)</p>	<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, from start to finish, including the preparation of ingredients.</li> <li>Cooking safely, following basic hygiene rules.</li> <li>Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet).</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>
<p>Evaluate: Eating seasonally (Y3) Adapting a recipe (Y4) What could be healthier? (Y5) Come dine with me (Y6)</p>	<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 food products.</li> <li>Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).</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 when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process.</li> <li>Evaluating health and safety in production to minimise cross contamination.</li> </ul>

<b>Textiles</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
<p>Design: Cushions/Egyptian Collars (Y3) Fastenings (Y4) Stuffed Toys (Y5) Waistcoats (Y6)</p>	<ul style="list-style-type: none"> <li>Designing and making a template from an existing cushion and applying individual design criteria.</li> </ul>	<ul style="list-style-type: none"> <li>Writing design criteria for a product, articulating decisions made.</li> <li>Designing a personalised book sleeve.</li> </ul>	<ul style="list-style-type: none"> <li>Designing a stuffed toy, considering the main component shapes required and creating an appropriate template.</li> <li>Considering the proportions of individual components.</li> </ul>	<ul style="list-style-type: none"> <li>Designing a waistcoat in accordance to a specification linked to set of design criteria.</li> <li>Annotating designs, to explain their decisions.</li> </ul>
<p>Make: Cushions/Egyptian Collars (Y3) Fastenings (Y4) Stuffed Toys (Y5)</p>	<ul style="list-style-type: none"> <li>Following design criteria to create a cushion or Egyptian collar.</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> </ul>	<ul style="list-style-type: none"> <li>Creating a 3D stuffed toy from a 2D design.</li> </ul>	<ul style="list-style-type: none"> <li>Using a template when cutting fabric to ensure they achieve the correct shape.</li> </ul>

Waistcoats (Y6)	<ul style="list-style-type: none"> <li>• Selecting and cutting fabrics with ease using fabric scissors.</li> <li>• Threading needles with greater independence.</li> <li>• Tying knots with greater independence.</li> <li>• Sewing cross stitch to join fabric.</li> <li>• Decorating fabric using appliqué.</li> <li>• Completing design ideas with stuffing and sewing the edges (Cushions) or embellishing the collars based on design ideas (Egyptian collars).</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring, marking and cutting fabric using a paper template.</li> <li>• Selecting a stitch style to join fabric.</li> <li>• Working neatly by sewing small, straight stitches.</li> <li>• Incorporating a fastening to a design.</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring, marking and cutting fabric accurately and independently .</li> <li>• Creating strong and secure blanket stitches when joining fabric.</li> <li>• Threading needles independently.</li> <li>• Using appliqué to attach pieces of fabric decoration.</li> <li>• Sewing blanket stitch to join fabric.</li> <li>• Applying blanket stitch so the spaces between the stitches are even and regular.</li> </ul>	<ul style="list-style-type: none"> <li>• Using pins effectively to secure a template to fabric without creases or bulges.</li> <li>• Marking and cutting fabric accurately, in accordance with their 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 features (such as appliqué) using thread.</li> <li>• Finishing the waistcoat with a secure fastening (such as buttons).</li> <li>• Learning different decorative stitches.</li> <li>• Sewing accurately with evenly spaced, neat stitches.</li> </ul>
Evaluate: Cushions/Egyptian Collars (Y3) Fastenings (Y4) Stuffed Toys (Y5) Waistcoats (Y6)	<ul style="list-style-type: none"> <li>• Evaluating an end product and thinking of other ways in which to create similar items.</li> </ul>	<ul style="list-style-type: none"> <li>• Testing and evaluating an end product against the original design criteria.</li> <li>• Deciding how many of the criteria should be met for the product to be considered successful.</li> <li>• Suggesting modifications for improvement.</li> <li>• Articulating the advantages and disadvantages of different fastening types.</li> </ul>	<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>• Reflecting on their work continually throughout the design, make and evaluate process.</li> </ul>

<b>Digital World</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
Design: Electronic Charm (Y3) Mindful moments timer (Y4) Monitoring devices (Y5) Navigating the World (Y6)	<ul style="list-style-type: none"> <li>• Problem solving by suggesting potential features on a Micro: bit and justifying my ideas.</li> <li>• Developing design ideas for a technology pouch.</li> </ul>	<ul style="list-style-type: none"> <li>• Writing design criteria for a programmed timer (Micro:bit).</li> <li>• Exploring different mindfulness strategies.</li> </ul>	<ul style="list-style-type: none"> <li>• Researching (books, internet) for a particular (user's) animal's needs.</li> <li>• Developing design criteria based on research.</li> </ul>	<ul style="list-style-type: none"> <li>• Writing a design brief from information submitted by a client.</li> <li>• Developing design criteria to fulfil the client's request.</li> </ul>

	<ul style="list-style-type: none"> <li>• Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.</li> </ul>	<ul style="list-style-type: none"> <li>• Applying the results of my research to further inform my design criteria.</li> <li>• Developing a prototype case for my mindful moment timer.</li> <li>• Using and manipulating shapes and clipart by using computer-aided design (CAD), to produce a logo.</li> <li>• Following a list of design requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• Generating multiple housing ideas using building bricks.</li> <li>• Understanding what a virtual model is and the pros and cons of traditional and CAD modelling.</li> <li>• Placing and manoeuvring 3D objects, using CAD.</li> <li>• Changing the properties of, or combining one or more 3D objects, using CAD.</li> </ul>	<ul style="list-style-type: none"> <li>• Considering and suggesting additional functions for my navigation tool.</li> <li>• Developing a product idea through annotated sketches.</li> <li>• Placing and manoeuvring 3D objects, using CAD.</li> <li>• Changing the properties of, or combining one or more 3D objects, using CAD.</li> </ul>
<p>Make:</p> <p>Electronic Charm (Y3) Mindful moments timer (Y4) Monitoring devices (Y5) Navigating the World (Y6)</p>	<ul style="list-style-type: none"> <li>• Using a template when cutting and assembling the pouch.</li> <li>• Following a list of design requirements.</li> <li>• Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.</li> <li>• Applying functional features such as using foam to create soft buttons.</li> <li>• Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.</li> </ul>	<ul style="list-style-type: none"> <li>• Developing a prototype case for my mindful moment timer.</li> <li>• Creating a 3D structure using a net.</li> <li>• Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press.</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding the functional and aesthetic properties of plastics.</li> <li>• Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range.</li> </ul>	<ul style="list-style-type: none"> <li>• Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo).</li> <li>• Explaining material choices and why they were chosen as part of a product concept.</li> <li>• Programming an N,E, S, W cardinal compass.</li> </ul>
<p>Evaluate:</p> <p>Electronic Charm (Y3) Mindful moments timer (Y4) Monitoring devices (Y5) Navigating the World (Y6)</p>	<ul style="list-style-type: none"> <li>• Analysing and evaluating an existing product.</li> <li>• Identifying the key features of a pouch.</li> </ul>	<ul style="list-style-type: none"> <li>• Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages.</li> <li>• Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I made.</li> <li>• Documenting and evaluating my project.</li> </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 suggesting ways to make more sustainable choices.</li> <li>• Explaining key functions in my program (audible alert, visuals).</li> </ul>	<ul style="list-style-type: none"> <li>• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.</li> <li>• Developing an awareness of sustainable design.</li> <li>• Identifying key industries that utilise 3D CAD modelling and explaining why.</li> </ul>

		<ul style="list-style-type: none"> <li>• Understanding what a logo is and why they are important in the world of design and business.</li> <li>• Testing my program for bugs (errors in the code).</li> <li>• Finding and fixing the bugs (debug) in my code.</li> </ul>	<ul style="list-style-type: none"> <li>• Explaining how my product would be useful for an animal carer including programmed features.</li> </ul>	<ul style="list-style-type: none"> <li>• Describing how the product concept fits the client's request and how it will benefit the customers.</li> <li>• Explaining the key functions in my program, including any additions.</li> <li>• Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool.</li> <li>• Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch.</li> <li>• Demonstrating a functional program as part of a product concept pitch.</li> </ul>
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