

St Ann's Heath Junior School – DT skills progression

Curriculum Intent	<ul style="list-style-type: none"> • Ensure that the Design and Technology scheme of work enables pupils to meet the end-of-key-stage attainment targets in the National Curriculum. • Inspire pupils to be innovative and creative thinkers in the field of Design and Technology. • Foster an appreciation for the entire product design cycle, including ideation, creation, and evaluation. • Develop children's confidence to take risks in their design process. • Encourage drafting design concepts, modelling, and testing as integral parts of the creative journey. • Cultivate reflective learners who regularly evaluate their own work. • Promote critical assessment of the work of others, fostering a culture of continuous improvement. • Build an awareness of the impact of design and technology on everyday life. • Highlight the significance of design advancements and technological contributions to society. • Encourage children to become resourceful and enterprising citizens. • Equip children with skills that contribute to future design advancements, fostering a sense of responsibility.
--------------------------	---

		Year 3	Year 4	Year 5	Year 6
<u>Structures</u>	<ul style="list-style-type: none"> • <u>Design</u> 	<u>Constructing A Castle</u> <ul style="list-style-type: none"> • 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 	<u>Pavilions</u> <ul style="list-style-type: none"> • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect • Building frame structures to support weight 	<u>Bridges</u> <ul style="list-style-type: none"> • Designing a stable structure that is able to support weight • Creating a frame structure with a focus on triangulation 	<u>Playgrounds</u> <ul style="list-style-type: none"> • Design a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs

		<ul style="list-style-type: none"> • Designing and/or decorating a castle tower on CAD software 			
	<ul style="list-style-type: none"> • <u>Make</u> 	<ul style="list-style-type: none"> • Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials 	<ul style="list-style-type: none"> • 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 structure in accordance with a plan • Learning to create different textural effects with material 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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

	<ul style="list-style-type: none"> • Evaluate 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Evaluating structures made by the class • Describing what characteristics of a design and construction made it the most effective • Considering effective and ineffective designs 	<ul style="list-style-type: none"> • Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary • Suggesting points for improvement for own bridges and those designed by others 	<ul style="list-style-type: none"> • 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
<p><u>Mechanics/ Mechanical Systems</u></p>	<ul style="list-style-type: none"> • Design 	<p><u>Pneumatic Toys</u></p> <ul style="list-style-type: none"> • Designing a toy which uses a pneumatic system • Developing design criteria from a design brief • Generating ideas using thumbnails, sketches and exploded diagrams • Learning that different types of drawings are used in design to explain ideas clearly 	<p><u>Making A Slingshot Car</u></p> <ul style="list-style-type: none"> • Designing a shape that reduces air resistance • Drawing a net to create a structure from • Choosing shapes that increase or decrease speed as a result of air resistance • Personalising a design 	<p><u>Pop-Up Book</u></p> <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 	<p><u>Automata Toys</u></p> <ul style="list-style-type: none"> • Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement • Understanding how linkages change the direction of a force • Making things move at the same time • Understanding and drawing cross-sectional diagrams to show the inner-workings of my design
	<ul style="list-style-type: none"> • Make 	<ul style="list-style-type: none"> • Creating a pneumatic system to create a desired motion • Building secure housing for a pneumatic system • Using syringes and balloons to create different types of pneumatic systems to make 	<ul style="list-style-type: none"> • Measuring, marking, cutting and assembling with increasing accuracy • Making a model based on a chosen design 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Measuring, marking and checking the accuracy of the jelutong and dowel pieces required • Measuring, marking and cutting components accurately using a ruler and scissors

		<p>a functional and appealing pneumatic toy</p> <ul style="list-style-type: none"> • Selecting materials due to their functional and aesthetic characteristics • Manipulating materials to create different effects by cutting, creasing, folding and weaving 		<ul style="list-style-type: none"> • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result 	<ul style="list-style-type: none"> • Assembling components accurately to make a stable frame • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles • Selecting appropriate materials based on the material being joined and the speed at which the glue needs to dry/set
	<ul style="list-style-type: none"> • Evaluate 	<ul style="list-style-type: none"> • Using the views of others to improve designs • Testing and modifying the outcome, suggesting improvement • Understanding the purpose of exploding diagrams through the eyes of a designer and their client 	<ul style="list-style-type: none"> • Valuating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Evaluating the work of others and receiving feedback on own work • Applying points of improvement to their toys • Describing changes they would make/do if they were to do the project again
<u>Electrical Systems</u>	<ul style="list-style-type: none"> • Design 	<ul style="list-style-type: none"> • N/A 	<p><u>Torches</u></p> <ul style="list-style-type: none"> • Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas 	<p><u>Doodlers</u></p> <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 	<p><u>Steady Hand Game</u></p> <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

				<ul style="list-style-type: none"> investigating existing products Developing design criteria that clarifies the target user 	<ul style="list-style-type: none"> Modelling ideas through prototypes
	<ul style="list-style-type: none"> Make 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Making a torch with a working electrical circuit and switch Using appropriate equipment to cut and attach materials Assembling a torch according to the design and success criteria 	<ul style="list-style-type: none"> Altering a product 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 	<ul style="list-style-type: none"> 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
	<ul style="list-style-type: none"> Evaluate 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Evaluating electrical products Testing and evaluating the success of a final product 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Testing own and others finished games, identifying what went well and making suggestions for improvement
<u>Cooking and Nutrition</u>	<ul style="list-style-type: none"> Design 	<u>Eating Seasonally</u> <ul style="list-style-type: none"> Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients; considering the taste, texture, smell and appearance of the dish 	<u>Adapting A Recipe</u> <ul style="list-style-type: none"> Designing a biscuit within a given budget, drawing upon previous testing judgements 	<u>What Could Be Healthier?</u> <ul style="list-style-type: none"> Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add ingredients 	<u>Come Dine With Me</u> <ul style="list-style-type: none"> Writing a recipe, explaining the key steps, method and ingredients Including facts and drawings from research undertaken

				<ul style="list-style-type: none"> • Writing an amended method for a recipe to incorporate the relevant changes to ingredients • Designing appealing packaging to reflect a recipe 	
	<ul style="list-style-type: none"> • <u>Make</u> 	<ul style="list-style-type: none"> • Knowing how to prepare themselves a workspace to cook safely in, learning the basic rules to avoid food contamination • Following the instructions within a recipe 	<ul style="list-style-type: none"> • Following a baking recipe, from start to finish, including the preparation of ingredients • Cooking safely, following basic hygiene rules • Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet) 	<ul style="list-style-type: none"> • Cutting and preparing vegetables safely • Using equipment safely, including knives, hot pans and hobs • Knowing how to avoid cross-contamination • Following a step by step method carefully to make a recipe 	<ul style="list-style-type: none"> • Following a recipe, including using the correct quantities of each ingredient • Adapting a recipe based on research • Working to a given timetable • Working safely and hygienically, with independence
	<ul style="list-style-type: none"> • <u>Evaluate</u> 	<ul style="list-style-type: none"> • Establishing and using design criteria to help test and review dishes • Describing the benefits of seasonal fruits and vegetables, and the impact on the environment • Suggesting points of improvement when making a seasonal tart 	<ul style="list-style-type: none"> • Evaluating a recipe, considering taste, smell, texture and appearance • Describing the impact of the budget on the selection of ingredients • Evaluating and comparing a range of food products • Suggesting modifications to a recipe (e.g. The biscuit has too many raisins, and it is falling apart, so next time I will use less raisins) 	<ul style="list-style-type: none"> • Identify the nutritional differences between different products and recipes • Identifying and describing healthy benefits of food groups 	<ul style="list-style-type: none"> • Evaluating a recipe, considering: taste, smell, texture and origin of the food group • Taste testing and scoring final products • Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process

					<ul style="list-style-type: none"> Evaluating health and safety in production to minimise cross-contamination
<u>Textiles</u>	<ul style="list-style-type: none"> <u>Design</u> 	<u>Cushions/Egyptian Collars</u> <ul style="list-style-type: none"> Designing and making a template from an existing cushion and applying individual design criteria 	<u>Fastenings</u> <ul style="list-style-type: none"> Writing design criteria for a product, articulating decisions made Designing a personalised book sleeve 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
	<ul style="list-style-type: none"> <u>Make</u> 	<ul style="list-style-type: none"> Following design criteria to create a cushion or Egyptian collar 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 applique Completing design ideas with stuffing and sewing the edges (cushions) or embellishing the collars based on design ideas (Egyptian collars) 	<ul style="list-style-type: none"> 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 by sewing small, straight stitches Incorporating fastenings into a design 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A

	<ul style="list-style-type: none"> <u>Evaluate</u> 	<ul style="list-style-type: none"> Evaluating an end product and thinking of other ways in which to create similar items 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
<u>Digital World</u>	<ul style="list-style-type: none"> <u>Design</u> 	<p><u>Electronic Charm</u></p> <ul style="list-style-type: none"> Problem solving by suggesting potential features on a Micro: bit and justifying my ideas Developing design ideas for a technology pouch Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge 	<ul style="list-style-type: none"> N/A 	<p><u>Monitoring Devices</u></p> <ul style="list-style-type: none"> Researching (books, internet), for a particular (user's) animal's needs Developing design criteria based on research Generating multiple housing ideas using building bricks Understanding what a virtual model is and the pros and cons of traditional and CAD modelling Placing and manoeuvring 3D objects, using CAD Changing the properties of, or combining one or more 3D objects, using CAD 	<p><u>Navigating The World</u></p> <ul style="list-style-type: none"> Writing a design brief from information submitted by a client Developing design criteria to fulfil the clients request Considering and suggesting additional functions for my navigation tool Developing a product idea through annotated sketches Placing and manoeuvring 3D objects, using CAD Changing the properties of, or combining one or more 3D object, using CAD

	<ul style="list-style-type: none"> • <u>Make</u> 	<ul style="list-style-type: none"> • Using a template when cutting and assembling the pouch • Following a list of design requirements • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch • Applying functional features such as foam to create soft buttons 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Understanding the functional and aesthetic properties of plastics • Programming to monitor the ambient temperature and coding the (audible or visual) alert when the temperature rises above or falls below a specified range 	<ul style="list-style-type: none"> • Considering materials and their functional properties, specially those that are sustainable and recyclable (for example, cork and bamboo) • Explaining material choices and why they were chosen as part of a product concept • Programming an N, E, S, W cardinal compass
	<ul style="list-style-type: none"> • <u>Evaluate</u> 	<ul style="list-style-type: none"> • Analysing and evaluating an existing product • Identifying the key features of a pouch 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Stating an event or fact from the last 100 years of plastic history • Explaining how plastic is affecting the planet earth and suggesting ways to make more sustainable choices • Explaining key functions in my program (audible alert, visuals) • Explaining how my product would be useful for an animal carer including programmed features 	<ul style="list-style-type: none"> • Explaining how my programme fits the design criteria and how it would be useful as part of a navigation tool • Developing an awareness of sustainable design • Identifying key industries that utilise 3D CAD modelling and explaining why • Describing how the product concept fits the clients request and how it will benefit the customers • Explaining the key features of my programme, including any additions • Explaining how my program fits the design criteria and

					<p>how it would be useful as part of a navigation tool</p> <ul style="list-style-type: none">• Explaining the key functions features of my navigation tool to the client as part of a product concept pitch• Demonstrating a functional program as part of a product concept pitch
--	--	--	--	--	---