

Hazelbury Bryan Primary School

Design and Technology Disciplinary Knowledge Progression

Design and Technology progression across the school

To be achieved by:	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures Design Make Evaluation	<ul style="list-style-type: none"> Learning the importance of a clear design criteria. Including individual preferences and requirements in a design. Making stable structures from card, tape and glue. Following instructions to cut and assemble the supporting structures Making functioning axles which are assembled into a main supporting structure. Evaluating according to the design criteria, testing whether a structure is strong and stable and altering it if it isn't Suggest points for improvements. 	<ul style="list-style-type: none"> Generating and communicating ideas using sketching and modelling. Learning about different types of structures, found in the natural world and in everyday objects. Making a structure according to design criteria Creating joints and structures from paper/card and tape Exploring the features of structures Comparing the stability of different shapes Testing the strength of own structures Identifying the weakest part of a structure Evaluating the strength, stiffness and stability of own structure 	<ul style="list-style-type: none"> Design a structure with key features to appeal to a specific person/ purpose. Drawing and labelling a design using 2D shapes, labelling: <ul style="list-style-type: none"> the 3D shapes that will create the features - material, need and colours. Constructing a range of 3D geometric shapes using nets. Creating special features for individual designs. 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"> Design a stable structure that is aesthetically pleasing and selecting materials to create a desired effect Building frame structures designed to support weight Creating a range of different shaped frame structures Making a variety of free standing frame structures of different shapes and sizes Selecting appropriate materials to build a strong structure and for the cladding Reinforcing corners to strengthen a structure Creating a design in accordance with a plan Learning to create different textural effects with materials 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"> Designing a stable structure that is able to support weight. Creating frame structure with focus on triangulation Making a range of different tall buildings Using triangles to create stable structures. 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 Adapting and improving a structure by identifying points of weakness and reinforcing them as necessary Suggesting points for improvements for own structure and those designed by others 	<ul style="list-style-type: none"> Design a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs Building a range of 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 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
Mechanisms Design Make Evaluation	<ul style="list-style-type: none"> Explaining how to adapt mechanisms to control the movement Design a product for a given audience 	<ul style="list-style-type: none"> Creating a design criteria for a product with a mechanism. Design a moving mechanism for a specific audience in 	<ul style="list-style-type: none"> Designing a product which uses a pneumatic system. Developing design criteria from a design brief Generating ideas using 	<ul style="list-style-type: none"> Drawing a net to create a structure. Personalising a design. Measuring, marking, cutting and assembling with increasing 	<ul style="list-style-type: none"> Design a product which uses a mixture of structures and mechanisms Naming each mechanism, input and output accurately 	<ul style="list-style-type: none"> After experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement

	<ul style="list-style-type: none"> • Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move • Creating clearly labelled drawings which illustrate movement. <p>Following a design to create moving models that use levers and sliders</p> <p>Adapting mechanisms</p> <ul style="list-style-type: none"> • Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed • Reviewing the success of a product by testing it with its intended audience • Testing mechanisms, identifying what stops wheels from turning, 	<p>accordance with a design criteria</p> <ul style="list-style-type: none"> • Selecting a suitable linkage system to produce the desired motions • Designing a wheel • Selecting appropriate materials based on their properties. • Making linkages using card for levers and split pins for pivots • Experimenting with linkages adjusting the widths, lengths and thicknesses of card used • Cutting and assembling components neatly • Selecting materials according to their characteristics • Following a design brief <ul style="list-style-type: none"> • Evaluating own designs against design criteria • Using peer feedback to modify a final design • Evaluating different designs • Testing and adapting a design 	<p>thumbnail sketches and exploded diagrams</p> <ul style="list-style-type: none"> • Learning that different types of drawings are used in design to explain ideas clearly. • 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 a functional and appealing pneumatic product • Selecting materials due to their functional and aesthetic characteristics • Manipulating materials to create different effects by cutting, creasing, folding, weaving <ul style="list-style-type: none"> • Using the views of others to improve designs • Testing and modifying the outcome, suggesting improvements 	<p>accuracy</p> <ul style="list-style-type: none"> • Making a model based on a chosen design • Evaluating the final product based on the design brief and the accuracy of workmanship on performance 	<ul style="list-style-type: none"> • Following a design brief to make a product, 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 <ul style="list-style-type: none"> • Evaluating the work of others and receiving feedback on own work • Suggesting points for improvement 	<ul style="list-style-type: none"> • Understanding how linkages change the direction of a force • Making things move at the same time. • Measuring, marking and checking the accuracy of the wood and dowel pieces required • Measuring, marking and cutting components accurately using a ruler and scissors • 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 materials being joined and the speed at which the glue needs to dry/set <ul style="list-style-type: none"> • Evaluating the work of others and receiving feedback on own work • Applying points of improvements • Describing changes they would make/ do if they were to do the project again
<p>Electrical Systems Design Make Evaluation</p>			<ul style="list-style-type: none"> • Designing a product that works using electricity • Identifying a design criteria and a target audience <ul style="list-style-type: none"> • Making a product referring to the design criteria • Using a wider range of materials and equipment safely • Learning to give constructive criticism on own work and the work of others • Testing the success of a product against the original design criteria and justifying opinions 	<ul style="list-style-type: none"> • Designing a product giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas <ul style="list-style-type: none"> • Making a product 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 • Evaluating electrical products • Testing and evaluating the 	<ul style="list-style-type: none"> • Designing an electronic product with a simple electrical control circuit • Creating a labelled design showing positive and negative parts in relation to the LED and the battery <ul style="list-style-type: none"> • Making a working circuit • Creating an electronic product referring to a design criteria • Mapping out where different components of the circuit will go • Evaluating a completed product against the original design sheet and looking at modifications that could be made to 	<ul style="list-style-type: none"> • Design a product identifying and naming the components required • Drawing a design from three different perspectives <ul style="list-style-type: none"> • Generating ideas through sketching and discussion • Modelling ideas through prototypes • Making electromagnetic motors and tweaking the motor to improve its function • Constructing a stable base for an electromagnetic game • Accurately cutting,

				success of a final product and taking inspiration from the work of peers	improve the reliability or aesthetics of it or to incorporate another type of electronic device, eg: buzzer	folding and assembling a net <ul style="list-style-type: none"> Decorating the base of the game to a high quality finish Making and testing a circuit Incorporating a circuit into a base Testing own and others finished products identifying what went well and making suggestions for improvement
Cooking and Nutrition Design Make Evaluation	<ul style="list-style-type: none"> Chopping fruit and vegetables safely to make a product Identifying if a food is a fruit or a vegetable Learning where and how fruits and vegetables grow Tasting and evaluating different food combinations Describing appearance, smell and taste Suggesting information to be included on packaging 	<ul style="list-style-type: none"> Designing a healthy product based on a food combination which work well together Slicing food safely using the bridge or claw grip Constructing a product that meets a design brief Describing the taste, texture and smell of fruit and vegetables Taste testing food combinations and final products Describing the information that should be included on a label Evaluating which grip was most effective 	<ul style="list-style-type: none"> Creating a healthy and nutritious recipe using seasonal ingredients, considering the taste, texture, smell and appearance of the dish Knowing how to prepare themselves and a workspace to cook safely in, learning the basic rules to avoid food contamination Following the instructions within a recipe 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 for improvement when making a product 	<ul style="list-style-type: none"> Designing a product within a given budget, drawing upon previous taste testing Following a baking recipe Cooking safely, following basic hygiene rules Adapting a recipe 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 products Suggesting modifications 	<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 additional ingredients Writing an amended method for a recipe to incorporate the relevant changes to ingredients Designing appealing packaging to reflect a recipe 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 Identifying the nutritional differences between different products and recipes Identifying and describing healthy benefits of food groups 	<ul style="list-style-type: none"> Writing a recipe, explaining the key steps, method and ingredients Including facts and drawings from research undertaken Following a recipe, including using the correct quantities of each ingredient Adapting a recipe based on research Working to a given timescale Working safely and hygienically with independence 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 in productions Evaluating health and safety in production to minimise cross contamination
Textiles Design Make Evaluation	<ul style="list-style-type: none"> Using a template to create a design Cutting fabric neatly with scissors Using joining methods connect fabric pieces Sequencing steps for construction 	<ul style="list-style-type: none"> Designing a textile product using their own template Selecting and cutting fabrics for sewing Decorating fabric using fabric glue or running stitch 	<ul style="list-style-type: none"> Designing and making a template from an existing product and applying individual design criteria Following design criteria to create a product Selecting and cutting fabrics with ease using 	<ul style="list-style-type: none"> Writing design criteria for a product, articulating decisions made Designing personalised product Making and testing a paper template with accuracy and in keeping 	<ul style="list-style-type: none"> Designing a product considering the main component shapes required and creating an appropriate template Considering proportions of individual components Measuring, marking and 	<ul style="list-style-type: none"> Designing a product in accordance to specification linked to set of design criteria to fit a specific theme Annotating designs Using template pinning panels onto fabric

	<ul style="list-style-type: none"> • Reflecting on a finished product, explaining likes and dislikes 	<ul style="list-style-type: none"> • Troubleshooting scenarios posed by 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 why 	<p>fabric scissors</p> <ul style="list-style-type: none"> • Sewing cross stitch to join fabric • Decorating fabric using appliqué • Completing design ideas with by sewing the edges • Evaluating an end product and thinking of other ways in which to create similar items 	<p>with the design criteria</p> <ul style="list-style-type: none"> • Measuring, marking and cutting fabric using a paper template • Selecting a stitch style to join fabric, working neatly sewing small neat stitches • Incorporating fastening to a design • 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 	<p>cutting fabric accurately and independently</p> <ul style="list-style-type: none"> • Creating strong and secure blanket stitches when joining fabric • Using applique to attach pieces of fabric decoration • Testing and evaluating an end product and giving point for further improvements 	<ul style="list-style-type: none"> • 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 product attaching objects using thread and adding a secure fastening • Evaluating work continually as it is created
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