Design and Technology Progression of Skills and Knowledge 2024/25

	Year	1	2	3	4/5	6
Design	Structures	• Learning the importance of a clear design criteria • Including individual preferences and requirements in a design	• Generating and communicating ideas using sketching and modelling • Learning about different types of structures, found in the natural world and in everyday objects	• Designing a structure with key features to appeal to a specific person/ purpose • Drawing and labelling a structure design using 2D shapes, labelling: - the 3D shapes that will create the features - materials need and colours	• Designing a stable structure that is able to support weight • Creating frame structure with focus on triangulation	• Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs
	Mechanical Systems	• Explaining how to adapt mechanisms,	• Creating a class design criteria for a moving monster	• Designing a toy which uses a pneumatic system	Designing a pop-up book which uses a mixture of	Experimenting with a range of cams, creating a

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		using bridges or guides to control the movement • Designing a moving story book for a given audience • Designing a vehicle that includes wheels, axles and axle holders, which will allow the wheels to move • Creating clearly labelled drawings which illustrate movement	• Designing a moving monster for a specific audience in accordance with a design criteria • Selecting a suitable linkage system to produce the desired motions • Designing a wheel Selecting appropriate materials based on their properties	• Developing design criteria from a design brief • Generating ideas using thumbnail sketches and exploded diagrams • Learning that different types of drawings are used in design to explain ideas clearly	structures and mechanisms • Naming each mechanism, input and output accurately • Storyboarding ideas for a book	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 the automata

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	Electrical Systems (KS2)				• Designing an electronic greetings card with a copper track circuit and components • Creating a labelled circuit diagram showing positive and negative parts in relation to the LED and the battery • Writing design criteria for an electronic greeting card • Compiling a moodboard relevant to my chosen theme,	• 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

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					purpose and recipient	products (toys), including what is meant by 'fit for purpose' and 'form over function'
	Cooking and Design	• Designing smoothie carton packaging by-hand or on ICT software	• Designing a healthy wrap based on a food combination which work well together	• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish	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	Writing a recipe, explaining the key steps, method and ingredients • Including facts and drawings from research undertaken

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					relevant changes to ingredients • Designing appealing packaging to reflect a recipe	
	Textiles	• Using a template to create a design for a puppet	• Designing a pouch	• Designing and making a template from an existing cushion and applying individual design criteria	• Designing a stuffed toy considering the main component shapes required and creating an appropriate template • Considering the proportions of individual components	• Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme • Annotating designs

	Year	1	2	3	4	5	6

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Make	Structures	• Making stable structures from card, tape and glue • 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	• Making a structure according to design criteria • Creating joints and structures from paper/card and tape	• Designing and making a template from an existing cushion and applying individual design criteria		• Making a range of different shaped beam bridges • Using triangles to create truss bridges that span a given distance and supports a load • Building a wooden bridge structure Independently measuring and marking wood accurately • Selecting appropriate tools and equipment for particular tasks	• 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

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						• 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	

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	Mechanical Systems	• Following a design to create moving models that use levers and sliders • Adapting mechanisms	• 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	• Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials		• 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	• Measuring, marking and checking the accuracy of the jelutong 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

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							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
	Electrical Systems (KS2)					• Making a functional series circuit • Creating an electronics greeting card, referring to a design criteria	• Constructing a stable base for a game • Accurately cutting, folding and assembling a net

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						• Mapping out where different components of the circuit will go	• Decorating the base of the game to a high quality finish • Making and testing a circuit Incorporating a circuit into a base
	Cooking and Design	• Chopping fruit and vegetables safely to make a smoothie • Identifying if a food is a fruit or a vegetable • Learning where and how fruits and vegetables grow	• Slicing food safely using the bridge or claw grip • Constructing a wrap that meets a design brief	• Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination • Following the instructions within 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	• 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

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						carefully to make a recipe	with independence
	Textiles	• Cutting fabric neatly with scissors • Using joining methods to decorate a puppet • Sequencing steps for construction	• Selecting and cutting fabrics for sewing • Decorating a pouch using fabric glue or running stitch	• Following design criteria to create a cushion • Selecting and cutting fabrics with ease using fabric scissors • Sewing cross stitch to join fabric • Decorating fabric using appliqué • Completing design ideas with		• 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 • Using applique to attach pieces	• 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

				stuffing and sewing the edges		of fabric decoration	• Tying strong knots • Decorating a waistcoat - attaching objects using thread and adding a secure fastening

	Year	1	2	3	4	5	6

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Evaluation	Structures	• 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	• 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	• Evaluating own work and the work of others based on the aesthetic of the finished product in comparison to the original design • Suggesting points for modification of the individual designs		• 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	• 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

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	Mechanical Systems	• 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, knowing that a wheel needs an axle in order to move	• Evaluating own designs against design criteria • Using peer feedback to modify a final design • Evaluating different designs • Testing and adapting a design	• Using the views of others to improve designs • Testing and modifying the outcome, suggesting improvement		• Evaluating the work of others and receiving feedback on own work • Suggesting points for improvement	• 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

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	Electrical Systems (KS2)					• Evaluating a peer's product against design criteria and suggesting modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of circuit component • Stating what Sir Rowland Hill invented and why it was important for greeting cards • Analysing and evaluating a	• Testing 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

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						range of existing greeting cards.	
	Cooking and Design	• Tasting and evaluating different food combinations • Describing appearance, smell and taste • Suggesting information to be included on packaging	• 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	• 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		• Identifying the nutritional differences between different products and recipes • Identifying and describing healthy benefits of food groups	• 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

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			• Evaluating which grip was most effective	improvement when making a seasonal tart			• Evaluating health and safety in production to minimise cross contamination
	Textiles	• Reflecting on a finished product, explaining likes and dislikes	• 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	• Evaluating an end product and thinking of other ways in which to create similar items		• Testing and evaluating an end product and giving point for further improvements	• Evaluating work continually as it is created

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			• Identifying aspects of their peers' work that they particularly like and why				

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	Year	1	2	3	4	5	6
Technical	Structures	• Describing the purpose of structures, including windmills • Learning how to turn 2D nets into 3D structures • Learning that the shape of materials can be changed to improve the strength and stiffness of structures	• Identifying natural and man-made structures • Identifying when a structure is more or less stable than another • Knowing that shapes and structures with wide, flat bases or legs are the most stable • Understanding that the shape of			• Exploring how to create a strong beam Identifying arch and beam bridges and understanding the terms: compression and tension • Identifying stronger and weaker structures • Finding different ways to reinforce structures	• Knowing that structures can be strengthened by manipulating materials and shapes • Identifying the shell structure in everyday life (cars, aeroplanes, tins, cans) • Understanding man made and natural structures

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		• Understanding that cylinders are a strong type of structure that are often used for windmills and lighthouses • Understanding that windmill turbines use wind to turn and make the machines inside work • Understanding that axles are used in structures and mechanisms to make parts turn in a circle • Developing awareness of	a structure affects its strength • Using the vocabulary: strength, stiffness and stability • Knowing that materials can be manipulated to improve strength and stiffness • Building a strong and stiff structure by folding paper			• Understanding how triangles can be used to reinforce bridges • Articulating the difference between beam, arch, truss and suspension bridges	

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		different structures for different purposes					
	Mechanical Systems	• Learning that levers and sliders are mechanisms and can make things move	• Learning that mechanisms are a collection of moving parts that work			• Knowing that an input is the motion used to start a mechanism	• Using a bench hook to saw safely and effectively

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		• Identifying whether a mechanism is a lever or slider and determining what movement the mechanism will make • Using the vocabulary: up, down, left, right, vertical and horizontal to describe movement • Identifying what mechanism makes a toy or vehicle roll forwards • Learning that for a wheel to move it must be	together in a machine • Learning that there is an input and output in a mechanism • Identifying mechanisms in everyday objects • Learning that a lever is something that turns on a pivot • Learning that a linkage is a system of levers that are connected by pivots			• Knowing that output is the motion that happens as a result of starting the input • Knowing that mechanisms control movement • Describing mechanisms that can be used to change one kind of motion into another	• Exploring cams, learning that different shaped cams produce different follower movements • Exploring types of motions and direction of a motion

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		attached to an axle	• Exploring wheel mechanisms • Learning how axels help wheels to move a vehicle				
	Electrical Systems (KS2)				• Learning how electrical items work • Identifying electrical products • Learning what electrical conductors and insulators are • Understanding that a battery contains stored electricity and	• Learning the key components used to create a functioning circuit • Learning that copper is a conductor and can be used as part of a circuit • Understanding that breaks in a circuit will stop it from working	• Learning that batteries contain acid, which can be dangerous if they leak • Identifying and naming the circuit components in a steady hand game

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					can be used to power products • Identifying the features of a torch • Understanding how a torch works • Articulating the positives and negatives about different torches	• Explaining how a series circuit will work in my card • Identifying the negative and positive leg of an LED • Drawing a series circuit diagram and symbols	
	Cooking and Design	• Understanding the difference between fruits and vegetables	• Understanding what makes a balanced diet	• Learning that climate affects food growth	• Understanding the impact of the cost and importance of budgeting while	• Understanding where food comes from - learning that beef is from	• Learning how to research a recipe by ingredient

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		• Describing and grouping fruits by texture and taste	• Knowing where to find the nutritional information on packaging • Knowing the five food groups	• Working with cooking equipment safely and hygienically • Learning that imported foods travel from far away and this can negatively impact the environment • Learning that vegetables and fruit grow in certain seasons • Learning that each fruit and vegetable gives us nutritional benefits	planning ingredients for biscuits • Understanding the environmental impact on future product and cost of production	cattle and how beef is reared and processed • Understanding what constitutes a balanced diet • Learning to adapt a recipe to make it healthier • Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option	• Recording the relevant ingredients and equipment needed for a recipe • Understanding the combinations of food that will complement one another • Understanding where food comes from, describing the process of 'Farm to Fork' for a given ingredient

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				• Learning to use, store and clean a knife safely			
	Textiles	• Reflecting on a finished product, explaining likes and dislikes	• 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	• 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	• Testing and evaluating an end product and giving point for further improvements	• Evaluating work continually as it is created

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