AVANTI HOUSE
EXCELLENCE · VIRTUE · DEVOTION

Curriculum Progression Map
Subject: Design and Technology

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils explore, design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Children are taught to use tools correctly and safely to combine their designing and making skills alongside their knowledge and understanding in order to construct products that satisfy needs and challenges. They will also learn to apply the principles of a healthy diet and prepare and cook a variety of dishes. As the children make their way through the school, they will develop their understanding to explore, Investigate and analyse products, explore complex structures and use mechanical systems and electrical systems in products.

Key areas	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Key (Technical) knowledge **Food**	PD **Health and Self-care** *Early Learning Goal* Children know the importance for good health of	Understanding the difference between fruits and vegetables Describing and grouping fruits by	Understanding what makes a balanced diet Knowing where to find the nutritional information on	Learning that climate affects food growth Working with cooking equipment safely and	Understanding the impact of the cost and importance of budgeting while planning ingredients for biscuits	Understanding where food comes from. Understanding what constitutes a balanced diet	Learning how to research a recipe by ingredient Recording the relevant ingredients and

	physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.	texture and taste	packaging Knowing the five food groups	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 Learning to use, store and clean a knife safely	Understanding the environmental impact on future product and cost of production	Learning to adapt a recipe to make it healthier Comparing two adapted recipes using a nutritional calculator and then identifying the healthier option	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
Key (Technical) knowledge **Mechanisms**	UTW **Technology** *Early Learning Goal* Children recognise that a range of technology is used in places such as homes and schools. They select and use	Learning that levers and sliders are mechanisms and can make things move Identifying whether a mechanism is a lever or slider and	Learning that mechanisms are a collection of moving parts that work together in a machine Learning that there is an input and output in a	Understanding how pneumatic systems work Learning that mechanisms are a system of parts that work together to create motion	Learning that products change and evolve over time Learning that all moving things have kinetic energy	Knowing that an input is the motion used to start a mechanism Knowing that output is the motion that happens as a result of starting the	Using a bench hook to saw safely and effectively Exploring cams, learning that different shaped cams produce different follower

	technology for particular purposes.	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 attached to an axle	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 Exploring wheel mechanisms Learning how axels help wheels to move a vehicle	Understanding that pneumatic systems can be used as part of a mechanism Learning that pneumatic systems force air over a distance to create movement	Understanding that kinetic energy is the energy that something (object person) has by being in motion	input Knowing that mechanisms control movement Describing mechanisms that can be used to change one kind of motion into another	movements Exploring types of motions and direction of a motion
Key (Technical) knowledge **Structures**	UTW **Technology** *Early Learning Goal* Children recognise that a range of technology is used in places such as homes and schools. They	Describing the purpose of structures, including windmills Learning how to turn 2D nets into 3D structures	Identifying natural and man-made structures Identifying when a structure is more or less stable than another	Identifying features of a castle Identifying suitable materials to be selected and used for a castle, considering weight,	Learning what pavilions are and their purpose Building on prior knowledge of net structures and broadening knowledge of	Exploring how to create a strong beam Identifying arch and beam bridges and understanding the terms: compression and	Knowing that structures can be strengthened by manipulating materials and shapes Identifying the shell structure in

	select and use technology for particular purposes. EAD *Early Learning Goal* Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. EAD *Early Learning Goal* Children use what they have learnt about media and materials in original ways, thinking about uses and purposes. They represent	Learning that the shape of materials can be changed to improve the strength and stiffness of structures 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	Knowing that shapes and structures with wide, flat bases or legs are the most stable Understanding that the shape 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	compression, tension Extending the knowledge of wide and flat based objects are more stable Understanding the terminology of strut, tie, span, beam Understanding the difference between frame and shell structure	frame structures Learning that architects consider light, shadow and patterns when designing Implementing frame and shell structure knowledge Considering effective and ineffective designs	tension Identifying stronger and weaker structures Finding different ways to reinforce structures Understanding how triangles can be used to reinforce bridges Articulating the difference between beam, arch, truss and suspension bridges	everyday life (cars, aeroplanes, tins, cans) Understanding man made and natural structures

	their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.	different structures for different purposes					
Key (Technical) knowledge **Textiles**	EAD *Early Learning Goal* Children sing songs, make music and dance, and experiment with ways of changing them. They safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. EAD *Early Learning Goal* Children use what	Learning different ways in which to join fabrics together: pinning, stapling, gluing	Joining items using fabric glue or stitching Identifying benefits of these techniques Threading a needle Sewing running stitch, with evenly spaced, neat, even stitches to join fabric Neatly pinning and cutting fabric using a template	Threading needles with greater independence Tying knots with greater independence Sewing cross stitch and appliqué Understanding the need to count the thread on a piece of even weave fabric in each direction to create uniform size and appearance	Understanding that there are different types of fastenings and what they are Articulating the benefits and disadvantages of different fastening types	Learning to sew blanket stitch to join fabric Applying blanket stitch so the space between the stitches are even and regular Threading needles independently	Learning different decorative stitches Application and outcome of the individual technique Sewing accurately with even regularity of stitches

	they have learnt about media and materials in original ways, thinking about uses and purposes. They represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories.			Understanding that fabrics can be layered for affect			
Key (Technical) knowledge **Electrical Systems**	N/A	N/A	N/A	Understanding what static electricity is and how it moves objects through attraction or repulsion Generating static electricity independently Using static electricity to make objects move in a desired way	Learning how electrical items work Identifying electrical products Learning what electrical conductors and insulators are Understanding that a battery contains stored electricity and can	Learning the key components used to create a functioning circuit Learning that graphite is a conductor and can be used as part of a circuit Learning the difference between series and parallel circuits	Understanding how electromagnetic motors work Learning that batteries contain acid, which can be dangerous if they leak Learning that when electricity enters a magnetic field it can make a motor

					be used to power products Identifying the features of a torch Understanding how a torch works Articulating the positives and negatives about different torches	Understanding that breaks in a circuit will stop it from working	
Key Skills **Designing** **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 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 need and colours	Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect Building frame structures designed to support weight	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
Key Skills **Designing**		Explaining how to adapt mechanisms, using bridges or guides	Creating a class design criteria for a moving monster	Designing a toy which uses a pneumatic system	Designing a shape that reduces air resistance	Designing a pop-up book which uses a mixture of structures and	After experimenting with a range of cams, creating a

Mechanisms		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	Drawing a net to create a structure from Choosing shapes that increase or decrease speed as a result of air resistance Personalising a design	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
Key Skills **Designing** **Electrical Systems**		n/a	n/a	Designing a game that works using static electricity, including the instructions for playing the game Identifying a design criteria and a target audience	Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas	Designing an electronic greetings card with a simple electrical control circuit Creating a labelled design showing positive and negative parts in relation to the LED and the battery	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
Key Skills **Designing** **Cooking and Nutrition**	PD **Health and Self-care** *Early Learning Goal* Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.	N/A	Designing a healthy meal based on a food combination which work well together	Creating a healthy and nutritious recipe using seasonal ingredients, considering the taste, texture, smell and appearance of the dish	Designing a biscuit within a given budget, drawing upon previous taste testing	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	Writing a recipe, explaining the key steps, method and ingredients Including facts and drawings from research undertaken
Key Skills **Designing**		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	Writing design criteria for a product, articulating decisions made	Designing a stuffed toy considering the main component shapes required and creating	Designing a piece of clothing in accordance to specification linked to set of design

Textiles				design criteria Designing a personalised Book sleeve		an appropriate template Considering proportions of individual components	criteria to fit a specific theme Annotating designs
Key Skills **Making** **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	Constructing a range of 3D geometric shapes using nets Creating special features for individual designs Making facades from a range of recycled materials	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	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 Using the correct techniques to saws	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

					Learning to create different textural effects with materials	safely Identifying where a structure needs reinforcement and using card corners for support	
Key Skills **Making** **Mechanisms**		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	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 toy Selecting materials due to their functional and aesthetic characteristics Manipulating	Measuring, marking, cutting and assembling with increasing accuracy Making a model based on a chosen design	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 components must be cut accurately

				materials to create different effects by cutting, creasing, folding, weaving			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
Key Skills **Making** **Electrical Systems**	N/A	N/A	N/A	Making an electrostatic game, referring to the design criteria Using a wider range of materials and equipment safely Using electrostatic energy to move objects in isolation as well as in part of a system	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	Making a working circuit Creating an electronics greeting card, referring to a design criteria Mapping out where different components of the circuit will go	Making electromagnetic motors and tweaking the motor to improve its function Constructing a stable base for an electromagnetic 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
Key Skills **Making** **Cooking and Nutrition**	PD **Health and Self-care** *Early Learning Goal* Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.	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 (or similar) that meets a design brief	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	Following a baking recipe Cooking safely, following basic hygiene rules Adapting 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	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
Key Skills **Making** **Textiles**		Cutting fabric neatly with scissors Using joining methods to decorate a puppet	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	Making and testing a paper template with accuracy and in keeping with the design criteria Measuring, marking and	Creating a 3D stuffed toy from a 2D design Measuring, marking and cutting fabric accurately and	Using template pinning panels onto fabric Marking and cutting fabric accurately, in accordance with a

		Sequencing steps for construction		Sewing cross stitch to join fabric Decorating fabric using appliqué Completing design ideas with stuffing and sewing the edges	cutting fabric using a paper template Selecting a stitch style to join fabric, working neatly sewing small neat stitches Incorporating fastening to a design	independently Creating strong and secure blanket stitches when joining fabric Using applique to attach pieces of fabric decoration	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
Key Skills **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 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	Evaluating structures made by the class Describing what characteristics of a design and construction made it the most effective Considering effective and ineffective 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

			Evaluating the strength, stiffness and stability of own structure				
Key Skills **Evaluation** **Food**		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 Evaluating which grip was most effective	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 seasonal 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	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 Evaluating health and safety in production to minimise cross contamination
Key Skills **Evaluation** **Mechanisms**		Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed	Evaluating own designs against design criteria Using peer feedback to modify a final	Using the views of others to improve designs Testing and modifying the outcome,	Evaluating the speed of a final product based on: the affect of shape on speed and the accuracy of workmanship	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

		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	design Evaluating different designs Testing and adapting a design	suggesting improvements	on performance		Describing changes they would make/ do if they were to do the project again
Key Skills **Evaluation** **Electrical Systems**	N/A	N/A	N/A	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	Evaluating electrical products Testing and evaluating the success of a final product and taking inspiration from the work of peers	Evaluating a completed product against the original design sheet and looking at modifications that could be made to improve the reliability or aesthetics of it or to incorporate another type of electronic device, eg: buzzer	Testing own and others finished games, identifying what went well and making suggestions for improvement
Key Skills		Reflecting on a finished product, explaining likes	Troubleshooting scenarios posed by teacher	Evaluating an end product and thinking of other	Testing and evaluating an end product against	Testing and evaluating an end product and giving	Evaluating work continually as it is created

Evaluation **Textiles**		and dislikes	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	ways in which to create similar items	the original design criteria Deciding how many of the criteria should be met for the product to be considered successful Suggesting modifications for improvement	point for further improvements	
Key Vocabulary		**Food** Blender, carton, fruit, healthy, ingredients, peel, recipe, slice, smoothie, stencil, template, vegetable **Mechanisms** Assemble, design, evaluation, mechanism, model, slider,	**Food** Alternative, diet, balanced diet, evaluation, expensive, healthy, ingredients, nutrients, packaging, refrigerator, sugar, substitute **Mechanisms** Evaluation, input, lever, linear	**Food** Climate, dry, exported, imported, Mediterranean climate, nationality, nutrients, polar climate, recipe, seasonal food, seasons, temperate climate, tropical climate	**Food** Adapt, budget, equipment, evaluation, flavour, ingredients, method, net, packaging, prototype, quantity, recipe, target audience, unit of measurement, utilities	**Food** Cross-contamination, diet, ethical issues, farm, healthy, ingredients, method, nutrients, packaging, recipe, research, substitute, supermarket, vegan, vegetarian, welfare	**Food** Accompaniment, adjective, caption, collaboration, cookbook, cross-contamination, equipment, farm, flavour, illustration, imperative verb, ingredients, method, nationality, preparation,

		lever, stencil, target audience, template, test **Structure** Client, design, evaluation, net, stable, strong, test, weak **Textiles** Decorate, design, fabric, glue, model, staple, stencil, template **Mechanisms** Axle, axle holder, chassis, design, evaluation fix, mechanic, model, test, wheel	motion, linkage, mechanical, mechanism, motion, oscillating motion, output, pivot, reciprocating, motion, rotary motion, survey, waterproof, stable, strong, weak **Structure** Function, man-made, mould, natural, stable, stiff, strong, structure, test, weak **Textiles** Accurate, fabric, knot, pouch, running-stitch, sew, shape, stencil, template, thimble	**Structures** 2D shapes, 3D shapes, design criteria, evaluate, façade, feature, net, recyclable, scoring, stable, strong, structure, tab, weak **Textiles** Accurate, applique, cross-stitch, cushion, decorate, detail, fabric, patch, running-stitch, seam, stencil, stuffing, target audience, template **Electrical systems** Attract, component, constructive-criticism, design criteria, electrostatic, evaluation, feedback, motion, repel, target	**Structures** Aesthetic, cladding, design criteria, evaluation, frame structure, function, inspiration, pavilion, reinforce, stable, structure, target audience, texture, theme **Textiles** Aesthetic, assemble, design criteria, evaluation, fabric, fastening, mock-up, net, running-stitch, stencil, target audience, template **Electrical systems** Battery, bulb, buzzer, cell, component, conductor, copper, design criteria, electrical item, electricity,	**Mechanical systems** Aesthetic, computer-aided designs (CAD), caption, design, design brief, design criteria, exploded-diagram, function, input, linkage, mechanism, motion, output, pivot, prototype, slider, structure, template **Textiles** Accurate, annotate, appendage, blanket-stitch, design criteria, detail, evaluation, fabric, sew, shape, template **Electrical systems** Battery, buzzer, circuit, component, conductor, copper,	processed, reared, recipe, research, storyboard, target audience, top-tips, unit of measurement **Mechanical systems** Accurate, assembly-diagram, automata, axle, bench hook, cam, clamp, component, cutting list, diagram, dowel, drill bits, exploded diagram, finish, follower, frame, function, hand drill, jelutong, linkage, mark out, measure, mechanism, model, research, right-angle, set square, tenon saw **Textiles** Accurate, adapt, annotate, design,

				audience, test **Mechanical systems** Exploded-diagram, function, input, lever, linkage, mechanism, motion, net, output, pivot, pneumatic system, thumbnail sketch	electronic item, function, insulator, series circuit, switch, test, torch, wire **Mechanical systems** Aesthetic, air resistance, chassis, design, design criteria, function, graphics, kinetic energy, mechanism, net, structure	design, design criteria, function, graphite, innovative, insulator, LED, modify, parallel circuit, series circuit, switch, target audience, test, wire **Structures** Abutment, accurate, arched, beam, bridge, compression, coping saw, evaluation, file, forces, mark out, measure, predict, reinforce, research, right-angle, sandpaper, set square, shape, strong, structure, tenon saw, tension, test, weak	design criteria, detail, fabric, fastening, knot, properties, running-stitch, seam, sew, shape, target audience, template, thread, unique **Electrical systems** Assemble, battery, battery pack, bulb, bulb holder, buzzer, circuit, circuit symbol, component, conductor, copper, design, design criteria, evaluation, function, insulator, LED, magnetic field, net, perspective drawing, plan, pliers, prototype, series circuit, side view, steady hand, switch, symmetrical, target audience,

							test, top view, wire cutters **Structures** Adapt, apparatus, bench hook, cladding, coping saw, design, dowel, evaluation, feedback, idea, jelutong, landscape, mark out, measure, modify, natural materials, plan view, playground, prototype, reinforce sketch, strong, structure, tenon saw, texture, user, vice, weak