

Cycle A		Design Technology Knowledge Progression				
Willow EYFS	Term 1: Minibeasts and Ourselves in our Wonderful World <ul style="list-style-type: none"> I can explore different textures and materials to create simple models using my imagination and to express my ideas. I know how to use different materials to build models and create minibeast habitats. I can use junk modelling materials and joining materials. I know how to use threading materials independently to make models. 	Term 2: People Who Help Us (Bonfire Night/Christmas) <ul style="list-style-type: none"> I know how to keep safe and use a cane to safely cook marshmallows over an open fire. I can use large materials and objects to construct safely outside and in the Forest School, building for different purposes and using my imagination. I can explore using different tools, such as hammers and nails to create pictures using tac boards. I can explore how things work. 	Term 3: Dinosaurs <ul style="list-style-type: none"> I know how to make a jam sandwich. I know how to spread butter and cut bread, holding and using a knife correctly. I can explore using different techniques for joining materials, with different adhesives and discuss which one works best. I can talk about what I have made, how I made it and what materials I have used and why. 	Term 4: Castles and Fairy tales <ul style="list-style-type: none"> I know how to use a junior hacksaw to create jewellery. I can cut sections of wood and use a tool to poke out the middle of the wood to help me thread wool through. I know how to use scissors to cut materials and wool. I can use a sharp knife, wearing gloves to cut through vegetables safely and with control to make a healthy vegetable soup. 	Term 5: Eric Carle Art (animals/Under the Sea/Plants) <ul style="list-style-type: none"> Junk model animals. I can talk about what I have made and what I like and dislike about my creation. I can talk about how I could make my model better and what I might do differently next time. I can create collaboratively using inside and outside construction equipment and materials. 	Term 6: Space <ul style="list-style-type: none"> I can design and create a rocket. I know how to think about form and function. I know how to choose the best shapes/materials for different purposes.
	Beech	Mechanisms: Wheels and Axels <p>Skills:</p> <ul style="list-style-type: none"> Design a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move. Creating clearly labelled drawings that illustrate movement. Adapting mechanisms when: they do not work as they should, to fit their vehicle design, to improve how they work after testing their vehicle. Testing wheel and axle mechanisms, identifying what stops the wheels from 	Structures: Constructing a Windmill <p>Skills:</p> <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. Learning how to turn 2D nets into 3D structures. Following instructions to cut and assemble the supporting structure of a windmill. Making functional turbines and axles which are assembled into a main supporting structure. 	Cooking and Nutrition: Fruit and Vegetables <p>Skills:</p> <ul style="list-style-type: none"> Designing smoothie carton packaging by-hand or on ICT software. Chopping fruit and vegetables safely to make a smoothie. Tasting and evaluating different food combinations. Describing appearance, smell and taste. Suggest information to be included on packaging. <p>Knowledge</p>		

	<p>turning, and recognising that a wheel needs an axle in order to move.</p> <p>Knowledge</p> <ul style="list-style-type: none"> To know that wheels need to be round to rotate and move. To understand that for a wheel to move it must be attached to a rotating axle. To know that an axle moves within an axle holder which is fixed to the vehicle or toy. To know that the frame of a vehicle (chassis) needs to be balanced. To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles. <p>Suggested significant designers, inventors and developments: Henry Ford</p>	<ul style="list-style-type: none"> 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. <p>Knowledge</p> <ul style="list-style-type: none"> To understand that the shape of materials can be changed to improve the strength and stiffness of structures. To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). To understand that axles are used in structures and mechanisms to make parts turn in a circle. To begin to understand that different structures are used for different purposes. To know that a structure is something that has been made and put together. To know that a client is the person I am designing for. To know that design criteria is a list of points to ensure the product meets the client's needs and wants. To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. To know that windmill turbines use wind to turn and make the machines inside work. To know that a windmill is a structure with sails that are moved by the wind. To know the three main parts of a windmill are the turbine, axle and structure. <p>Suggested significant designers, inventors and developments: Cornelis Corneliszoon van Uitgeest, Daniel Halladay, Dr James Blyth</p>	<ul style="list-style-type: none"> Understanding the difference between fruit and vegetables To understand that some foods typically known as vegetables are actually fruits e.g. cucumber. To know that a blender is a machine which mixes ingredients together into a smooth liquid. To know that a fruit has seeds and a vegetable does not. To know that fruits grow on trees or vines. To know that vegetables can grow either above or below ground. To know that vegetables can come from different parts of the plant e.g. roots, potatoes, leaves: lettuce, fruit: cucumber.
Maple	<p>Cooking and nutrition: Eating Seasonally</p> <p>Skills</p>	<p>Mechanisms: Making a moving poster</p> <p>Skills</p>	<p>Structures: Castles</p> <p>Skills</p>

	<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. • 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 seasonal tart. <p>Knowledge</p> <ul style="list-style-type: none"> • To know that not all fruit and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a recipe. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country. • To understand that imported foods travel from far away and this can negatively impact the environment. • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. • To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health. • To know safety rules for using, storing and cleaning a knife safely. 	<ul style="list-style-type: none"> • Creating a class design criterion for a moving poster. • Designing a moving poster for a specific audience in accordance with a design criteria. • 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. • Evaluating own designs against design criteria. • Using peer feedback to modify a final design. <p>Knowledge</p> <ul style="list-style-type: none"> • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens because of the input. • To know that a lever is something that turns a pivot. • To know that a linkage mechanism is made up of a series of levers. • To know some real-life objects that contain mechanisms. 	<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 as well as the materials needed. • Designing and/or decorating a castle tower on CAD software. • Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials. • 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. <p>Knowledge</p> <ul style="list-style-type: none"> • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong to withstand enemy attack. • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. • To know that a design specification is a list of success criteria for a product.
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	<ul style="list-style-type: none"> To know that similar coloured fruits and vegetables often have similar nutritional benefits. 		<p>Suggested significant designers, inventors and developments: Eugène Viollet-le-Duc, Zaha Hadid, Alan Lee and John Howe</p>
<p>Hazel</p>	<p>Mechanical Systems: Making a slingshot car</p> <p>Skills</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 because of air resistance. Personalising a design. Measuring, marking, cutting and assembling with increasing accuracy. Making a model based on a chosen design. Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance. <p>Knowledge</p> <ul style="list-style-type: none"> To understand that all moving things have kinetic energy. To understand that kinetic energy is the energy that something (object/person) has by being in motion. To know that air resistance is the level of drag on an object as it is forced through the air. To understand that the shape of a moving object will affect how it moves due to air resistance. To understand that products change and evolve over time. To know that aesthetics means how an object or product looks in design and technology. To know that a template is a stencil you can use to help you draw the same shape accurately. To know that a birds-eye view means a view from a high angle (as if a bird in flight). 	<p>Textiles: Fastenings</p> <p>Skills</p> <ul style="list-style-type: none"> Writing a design criteria for a product, articulating decisions made. Make and test 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 fastening to a design. Testing and evaluating a 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. <p>Knowledge</p> <ul style="list-style-type: none"> To know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press study and Velcro. To know that different fastening types are useful for different purposes. To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions. 	<p>Digital World: Mindful moments timer</p> <p>Skills</p> <ul style="list-style-type: none"> Writing design criteria for a programmed timer (Micro:bit). Exploring different mindfulness strategies. Applying the results of my research to further inform my design criteria. Developing a prototype case for my mindful moment timer. Using and manipulating shapes and clipart by using computer-aided design (CAD), to produce a logo. Following a list of design requirements. Developing a prototype case for my mindful moment timer. Creating 3D structures using modelling materials. Programming a micro:bit in the Microsoft micro:bit editor, to time a set number of seconds/minutes upon button press. Investigating and analysing a range of timers by identifying and comparing their advantages and disadvantages. Evaluating my Micro:bit program against points on my design criteria and amending them to include any changes I made. Documenting and evaluating my project. Understanding what a logo is and why they are important in the world of design and business. Testing my program for bugs (errors in the code). Finding and fixing the bugs (debug) in my code.

	<ul style="list-style-type: none"> • To know that graphics are images which are designed to explain or advertise something. • To know that it is important to assess and evaluate design ideas and models against a list of design criteria. 		<ul style="list-style-type: none"> • Using an exhibition to gather feedback. • Gathering feedback from the user to make suggested improvements to a product. <p>Knowledge</p> <ul style="list-style-type: none"> • To understand what variables are in programming. • To know some of the features of a Micro:bit. • To know that an algorithm is a set of instructions to be followed by the computer. • To know that it is important to check my code for errors (bugs). • To know that a simulator can be used as a way of checking your code works before installing it onto an electronic device. To understand the terms 'ergonomic' and 'aesthetic'. • To know that a prototype is a 3D model made from cheap materials, that allows us to test design ideas and make better decisions about size, shape and materials. • To know that an exhibition is a way for companies to showcase products, meet potential new customers and gather feedback from users. <p>Suggested significant designers, inventors and developments: Ivy Ross, Amit Pitaru</p>
Oak	<p>Digital World: Monitoring Devices</p> <p>Skills</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. 	<p>Textiles (Linked to History topic)</p> <p>Skills</p> <ul style="list-style-type: none"> • Designing a product in accordance with a specification linked to set of design criteria. • Annotating designs, to explain their decisions. • Using a template when cutting fabric to ensure they achieve the correct shape. 	<p>Structures: Playgrounds</p> <p>Skills</p> <ul style="list-style-type: none"> • Designing 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"> • 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. • Understanding the functional and aesthetic properties of plastics. • Programming to monitor the ambient temperature and coding an (audible or visual) alert when the temperature rises above or falls below a specified range. • Stating an event or fact from the last 100 years of plastic history. • Explaining how plastic is affecting 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. <p>Knowledge</p> <ul style="list-style-type: none"> • To know that a 'device' means equipment created for a certain purpose or job and that monitoring devices observe and record. • To know that a sensor is a tool or device that is designed to monitor, detect and respond to changes for a purpose. • To understand that conditional statements (and, or, if booleans) in programming are a set of rules which are followed if certain conditions are met. • To understand key developments in thermometer history. • To know events or facts that took place over the last 100 years in the history of 	<ul style="list-style-type: none"> • Using pins effectively to secure a template to fabric without creases or bulges. • Marking and cutting fabric accurately, in accordance with their design. • Sewing a strong running stitch, making small, neat stitches and following the edge. • Tying strong knots. • Decorating and attaching features (such as appliqué) using thread. • Finishing with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches. • Reflecting on their work continually throughout the design, make and evaluate process. <p>Knowledge</p> <ul style="list-style-type: none"> • To understand that it is important to design clothing with the client/ target customer in mind. • To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. • To understand the importance of consistently sized stitches. 	<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. • 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>Knowledge</p> <ul style="list-style-type: none"> • To know that structures can be strengthened by manipulating materials and shapes. • To understand what a 'footprint plan' is. • To understand that in the real world, design, can impact users in positive and negative ways. • To know that a prototype is a cheap model to test a design idea.
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	<ul style="list-style-type: none">• plastic, and how this is changing our outlook on the future.• To know the 6Rs of sustainability.• To understand what a virtual model is and the pros and cons of traditional vs CAD modelling.		
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