National Curriculum Design Technology Programmes of Study and EYFS Framework		
Relevant Early Learning Goals		
Expressive Arts and Design (Creating with Materials)		
• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Share their creations, explaining the process they have used. • Make use of props and materials when role playing characters in narratives and stories.		
Little Doves	**Nursery**	**Reception**
• I explore materials using all of my senses. • I know how to use glue to stick materials together. • I am able to make a simple model.	• I confidently explore the materials freely so that I can develop ideas about how to use them and what to make. • I know how to join materials together. • I explore different textures confidently and can talk about them to others. • I understand how to create closed shapes with continuous lines, and begin to use these shapes to represent objects. • I know how to develop my own ideas and can then decide which materials to use to express them. • I explore freely in order to create designs and think about what I would like to make.	• I understand how to return to and build on previous learning in Nursery, refining my ideas and developing my ability to represent them. • I am able to create collaboratively sharing ideas, resources and skills. • I understand how to refine my ideas in designs I create.

Y1/2	**Y3/4 and Y5/6**
When designing and making, pupils should be taught to: **Design** • design purposeful, functional, appealing products for themselves and other users based on design criteria	When designing and making, pupils should be taught to: **Design** • use research and develop design criteria to inform the design of innovative, functional, appealing products that

• generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology **Make** • select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics **Evaluate** • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria **Technical Knowledge** • build structures, exploring how they can be made stronger, stiffer and more stable • explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.	are fit for purpose, aimed at particular individuals or groups • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design **Make** • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities **Evaluate** • investigate and analyse a range of existing products • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • understand how key events and individuals in design and technology have helped shape the world **Technical Knowledge** • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products.

Cooking and Nutrition Pupils should be taught to: • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from.	**Cooking and Nutrition** Pupils should be taught to: • understand and apply the principles of a healthy and varied diet • prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

Dovecotes Long Term Design Technology Planning						
EYFS	**KS1**		**Y3/4**		**Y5/6**	
EYFS teach through themes which are heavily led by the children's interests.	**Cycle A**	**Cycle B**	**Cycle A**	**Cycle B**	**Cycle A**	**Cycle B**
	Mechanisms ***Making a Movie Story Book*** Mechanisms ***Making a Movie Monster***	Structures and Mechanisms ***Fairground Wheel***	Mechanical Systems ***Pneumatic Toys***	Cooking and Nutrition ***Eating Seasonally***	Textiles ***Waistcoats***	Structure ***Bridges***
	Textiles ***Puppets*** Structures ***Constructing a Windmill***	Mechanisms ***Wheels and Axles:*** **Make a Moving Vehicle**	Electrical Systems ***Torches***	Cooking and Nutrition ***Adapting a Recipe***	Cooking and Nutrition ***What could be healthier?***	Mechanical Systems ***Automata Toys***
	Cooking and Nutrition ***Fruit and Vegetables*** Cooking and Nutrition ***A Balanced Diet***	Textiles ***Pouches***	Structure ***Pavillions***	Textiles ***Cross-stitch and Applique***	Electrical Systems ***Steady Hand Game***	Structure ***Playgrounds***

Knowledge and Skills					
Mechanisms					
EYFS					
• Early experiences of manipulating different media such as card and paper to join, construct, fasten and glue. • Experience of simple tools and techniques including glue, sellotape, paper fasteners, paper clips.					
KS1					
		Make a Moving Toy Monster	**Fairground Wheel**	**Wheels and Axles: Make a Moving Vehicle**	**Making a Movie Story Book**
Skills	**Design**	• Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.	• Selecting a suitable linkage system to produce the desired motion. • Designing a wheel.	• Designing 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.	• Explaining how to adapt mechanisms, using bridges or guides to control the movement. • Designing a moving story book for a given audience.
	Make	• 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.	• Adapting mechanisms, when: ○ they do not work as they should. ○ to fit their vehicle design. ○ to improve how they work after testing their vehicle.	• Following a design to create moving models that use levers and sliders.

	Evaluate	• Evaluating own designs against design criteria. • Using peer feedback to modify a final design.	• Evaluating different designs. • Testing and adapting a design.	• Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.	• 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.
Knowledge	**Technical**	• 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 as a result of the input.	• To know that different materials have different properties and are therefore suitable for different uses.	• 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 that a mechanism is the parts of an object that move together. • To know that a slider mechanism moves an object from side to side. • To know that a slider mechanism has a slider, slots , guides and an object. • To know that bridges and guides are bits of card that purposefully restrict the

		• To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers.			movement of the slider.
	Additional	• To know some real-life objects that contain mechanisms.	• To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur.	• To know some real-life items that use wheels such as wheelbarrows, hamster wheels and vehicles.	• To know that in Design and technology we call a plan a 'design'.
Mechanical Systems					
Y3/4					
		Pneumatic Toys			
Skills	**Design**	• Designing a toy which uses a pneumatic system. • 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.			
	Make	• 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 materials to create different effects by cutting, creasing, folding and weaving.
	Evaluate	• Using the views of others to improve designs. • Testing and modifying the outcome, suggesting improvements. • Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.
Knowledge	**Technical**	• To understand how pneumatic systems work. • To understand that pneumatic systems can be used as part of a mechanism. • To know that pneumatic systems operate by drawing in, releasing and compressing air
	Additional	• To understand how sketches, drawings and diagrams can be used to communicate design ideas. • To know that exploded-diagrams are used to show how different parts of a product fit together. • To know that thumbnail sketches are small drawings to get ideas down on paper quickly.
Y5/6		
		Automata Toys
Skills	**Design**	• 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
	Make	• 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 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.
	Evaluate	• 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.
Knowledge	**Technical**	• To understand that the mechanism in an automata uses a system of cams, axles and followers. • To understand that different shaped cams produce different outputs.
	Additional	• To know that an automata is a hand powered mechanical toy.

		• To know that a cross-sectional diagram shows the inner workings of a product. • To understand how to use a bench hook and saw safely. • To know that a set square can be used to help mark 90° angles

Knowledge and Skills			
Textiles			
EYFS			
• Explore a range of fabrics to experience different textures. • Explore the origins of textiles - for example, wool comes from sheep and cotton from a plant. • Use cut fabric for sticking. • Use fabric in imaginative play through den-making and tent-making or dressing up in different clothes.			
KS1			
		Puppets	**Pouches**
Skills	**Design**	• Using a template to create a design for a puppet.	• Designing a pouch.
	Make	• Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing the steps taken during construction.	• Selecting and cutting fabrics for sewing. • Decorating a pouch using fabric glue or running stitch. • Threading a needle. • Sewing running stitch, with evenly spaced, neat, even stitches to join fabric. • Neatly pinning and cutting fabric using a template.
	Evaluate	• 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.

Knowledge		• To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using staples. glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look.	• To know that sewing is a method of joining fabric. • To know that different stitches can be used when sewing. • To understand the importance of tying a knot after sewing the final stitch. • To know that a thimble can be used to protect my fingers when sewing.
Y3/4			
Cross-stitch and Applique			
Skills	**Design**	• Designing and making a template from an existing cushion and applying individual design criteria.	
	Make	• 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 appliqué. • Completing design ideas by embellishing the collars based on design ideas.	
	Evaluate	• Evaluating an end product and thinking of other ways in which to create similar items.	
Knowledge		• To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. • To know that when two edges of fabric have been joined together it is called a seam. • To know that it is important to leave space on the fabric for the seam. • To understand that some products are turned inside out after sewing so the stitching is hidden.	

Y5/6		
Waistcoats		
Skills	**Design**	• Designing a waistcoat in accordance to a specification linked to set of design criteria. • Annotating designs, to explain their decisions.
	Make	• Using a template when cutting fabric to ensure they achieve the correct shape. • 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 a waistcoat, attaching features (such as appliqué) using thread. • Finishing the waistcoat with a secure fastening (such as buttons). • Learning different decorative stitches. • Sewing accurately with evenly spaced, neat stitches.
	Evaluate	• Reflecting on their work continually throughout the design, make and evaluate process.
Knowledge		• 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.

Knowledge and Skills			
Cooking and Nutrition			
EYFS			
• To begin to understand some of the tools, techniques and processes involved in food preparation. • Know that vegetables and fruits are grown. • Know what is meant by the word healthy and identify healthy and or unhealthy foods.			
KS1			
		Fruit and Vegetables	**A Balanced Diet**
Skills	**Design**	• Designing smoothie carton packaging by-hand or on ICT software.	• Designing a healthy wrap based on a food combination which work well together.

	Make	• 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.
	Evaluate	• 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.
Knowledge		• Understanding the difference between fruits 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).	• To know that 'diet' means the food and drink that a person or animal usually eats. • To understand what makes a balanced diet. • To know where to find the nutritional information on packaging. • To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. • To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. • To know that nutrients are substances in food that all living things need to make energy, grow and develop. • To know that 'ingredients' means the items in a mixture or recipe. • To know that I should only have a maximum of five teaspoons of sugar a day to stay healthy.

			• To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.
Y3/4			
		Eating Seasonally	**Adapting a Recipe**
Skills	**Design**	• Creating a healthy and nutritious recipe for a savoury tart 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 judgements.
	Make	• 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.	• 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).
	Evaluate	• 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.	• 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. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins).
Knowledge		• To know that not all fruits 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 the amount of an ingredient in a recipe is known as the 'quantity.' • To know that it is important to use oven gloves when removing hot food from an oven. • To know the following cooking techniques: sieving, creaming, rubbing method, cooling. • To understand the importance of budgeting while planning ingredients for biscuits.

		• 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. • To know that similar coloured fruits and vegetables often have similar nutritional benefits.	
Y5/6			
What Could be Healthier?			
Skills	**Design**	• 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.	
	Make	• 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	
	Evaluate	• Identifying the nutritional differences between different products and recipes. • Identifying and describing healthy benefits of food groups.	
Knowledge		• To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.	

	• To know that I can adapt a recipe to make it healthier by substituting ingredients. • To know that I can use a nutritional calculator to see how healthy a food option is. • To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.

Knowledge and Skills		
Structures		
EYFS		
• Learn how everyday objects work by dismantling things. • Learn what is meant by strong/sturdy/structure/ foundation • Construct using a wide range of open-ended resources including lots of recycled materials and loose parts		
KS1		
		Constructing a Windmill
Skills	**Design**	• Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design.
	Make	• 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 functioning turbines and axles which are assembled into a main supporting structure.
	Evaluate	• 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.
Knowledge	**Technical**	• 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.

	Additional	• 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 clients 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.
Y3/4		
Pavillions		
Skills	**Design**	• Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.
	Make	• 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 design in accordance with a plan. • Learning to create different textural effects with materials.
	Evaluate	• Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs
Knowledge	**Technical**	• To understand what a frame structure is. • To know that a ‘free-standing’ structure is one which can stand on its own.
	Additional	• To know that a pavilion is a a decorative building or structure for leisure activities. • To know that cladding can be applied to structures for different effects. • To know that aesthetics are how a product looks. • To know that a product’s function means its purpose. • To understand that the target audience means the person or group of people a product is designed for.

		• To know that architects consider light, shadow and patterns when designing.	
Y5/6			
		• **Bridges**	• **Playgrounds**
Skills	**Design**	• Designing a stable structure that is able to support weight. • Creating a frame structure with a 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.
	Make	• 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 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.	• 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.
	Evaluate	• Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary.	• 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.

		• Suggesting points for improvements for own bridges and those designed by others.	
Knowledge	**Technical**	• To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on properties. • To understand the material (functional and aesthetic) properties of wood.	• To know that structures can be strengthened by manipulating materials and shapes.
	Additional	• To understand the difference between arch, beam, truss and suspension bridges. • To understand how to carry and use a saw safely.	• 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.

Knowledge and Skills		
Electrical Systems (KS2 only)		
Y3/4		
		Torches
Skills	**Design**	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.
	Make	• 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.

	Evaluate	• Evaluating electrical products. • Testing and evaluating the success of a final product
Knowledge	**Technical**	• To understand that electrical conductors are materials which electricity can pass through. • To understand that electrical insulators are materials which electricity cannot pass through. • To know that a battery contains stored electricity that can be used to power products. • To know that an electrical circuit must be complete for electricity to flow. • To know that a switch can be used to complete and break an electrical circuit.
	Additional	• To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.
Y5/6		
		Steady Hand Game
Skills	**Design**	• 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 products (toys), including what is meant by ‘fit for purpose’ and ‘form over function’.
	Make	• 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
	Evaluate	• 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.
Knowledge	**Technical**	• To know that batteries contain acid, which can be dangerous if they leak.

		• To know the names of the components in a basic series circuit, including a buzzer
	Additional	• To know that ‘form’ means the shape and appearance of an object. • To know the difference between 'form' and 'function'. • To understand that 'fit for purpose' means that a product works how it should and is easy to use. • To know that form over purpose means that a product looks good but does not work very well. • To know the importance of ‘form follows function’ when designing: the product must be designed primarily with the function in mind. • To understand the diagram perspectives 'top view', 'side view' and 'back'