



Design and Technology Skills - Progression through the National Curriculum

Notes:

- NC Criteria are only broken down into KS1 and KS2: the year-by-year assignments are Escomb Primary School Curriculum Offer
- Most of the DT offering is through termly topics however there are a number of Stand Alone Lessons (SAL) included in the programme.

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures		<i>Constructing a windmill</i>	<i>Baby Bear's chair</i>	<i>Constructing a castle</i>	<i>Pavilions</i>		<i>Playgrounds</i>
Design		<ul style="list-style-type: none"> • Learning the importance of a clear design criteria • Including individual preferences and requirements in a design 	<ul style="list-style-type: none"> • Generating and communicating ideas using sketching and modelling • Learning about different types of structures, found in the natural world and in everyday objects 	<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 - materials needed and colours • Designing and/or decorating a castle tower on CAD software 	<ul style="list-style-type: none"> • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect • Building frame structures designed to support weight 		<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
Make		<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Making a structure according to design criteria • Creating joints and structures from paper/card and tape • Building a strong and stiff structure by folding paper 	<ul style="list-style-type: none"> • Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials 	<ul style="list-style-type: none"> • 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 		<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

		structure			<p>accordance with a plan</p> <ul style="list-style-type: none"> • Learning to create different textural effects with materials 		
Evaluate			<ul style="list-style-type: none"> • Exploring the features of structures • Comparing the stability of different shapes • Testing the strength of own structures • Identifying the weakest part of a structure • Evaluating the strength, stiffness and stability of own structure 	<ul style="list-style-type: none"> • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design • Suggesting points for modification of the individual designs 	<ul style="list-style-type: none"> • Evaluating structures made by the class • Describing what characteristics of a design and construction made it the most effective • Considering effective and ineffective designs 		<ul style="list-style-type: none"> • 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
Technical Knowledge		<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 	<ul style="list-style-type: none"> • To know that shapes and structures with wide, flat bases or legs are the most stable • To understand that the shape of a structure affects its strength • To know that materials can be manipulated to improve strength and stiffness • To know that a structure is something which has been formed or made from parts • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move • To know that a 'strong' structure is one which does not break easily • To know that a 'stiff' structure or material is one which does not bend easily 	<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 	<ul style="list-style-type: none"> • To understand what a frame structure is • To know that a 'free-standing' structure is one which can stand on its own 		<ul style="list-style-type: none"> • To know that structures can be strengthened by manipulating materials and shapes

<p>Additional Knowledge</p>		<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • To know that natural structures are those found in nature • To know that man-made structures are those made by people 	<ul style="list-style-type: none"> • 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 and stable 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 	<ul style="list-style-type: none"> • To know that a pavilion is 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 		<ul style="list-style-type: none"> • 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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<i>Mechanisms/ Mechanical systems</i>		<i>SAL: Exploring sliders and movements Fairground Wheel</i>	<i>Making a moving monster</i>	<i>SAL: Exploring pneumatics</i>	<i>Making a slingshot car</i>	<i>Making a pop up book</i>	
Design		<ul style="list-style-type: none"> Explaining how to adapt mechanisms, using bridges or guides to control the movement Selecting a suitable linkage system to produce the desired motions Designing a wheel Selecting appropriate materials based on their properties 	<ul style="list-style-type: none"> Creating a class design criteria for a moving monster Designing a moving monster for a specific audience in accordance with a design criteria 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Designing a shape that reduces air resistance Drawing a net to create a structure Choosing shapes that increase or decrease speed as a result of air resistance Personalising a design 	<ul style="list-style-type: none"> Designing a pop-up book which uses a mixture of structures and mechanisms Naming each mechanism, input and output accurately Storyboarding ideas for a book 	
Make		<ul style="list-style-type: none"> Following a design to create moving models that use levers and sliders Selecting materials according to their characteristics Following a design brief 	<ul style="list-style-type: none"> 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 		<ul style="list-style-type: none"> Measuring, marking, cutting and assembling with increasing accuracy Making a model based on a chosen design 	<ul style="list-style-type: none"> 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 	
Evaluate		<ul style="list-style-type: none"> Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed Evaluating different designs Testing and adapting a design 	<ul style="list-style-type: none"> Evaluating own designs against design criteria Using peer feedback to modify a final design 		<ul style="list-style-type: none"> Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance 	<ul style="list-style-type: none"> Evaluating the work of others and receiving feedback on own work Suggesting points for improvement 	

<p>Technical Knowledge</p>		<ul style="list-style-type: none"> • 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 movement of the slider • To know that different materials have different properties and are therefore suitable for different uses 	<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 as a result of the input • 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 	<ul style="list-style-type: none"> • 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 	<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. 	<ul style="list-style-type: none"> • To know that mechanisms control movement • To understand that mechanisms that can be used to change one kind of motion into another • To understand how to use sliders, pivots and folds to create paper-based mechanisms 	
<p>Additional Knowledge</p>		<ul style="list-style-type: none"> • To know that in Design and technology we call a plan a 'design'. • 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 	<ul style="list-style-type: none"> • To know some real-life objects that contain mechanisms 		<ul style="list-style-type: none"> •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) •To know that graphics are images which are designed to explain or advertise something •To know that it is important to assess and 	<ul style="list-style-type: none"> • To know that a design brief is a description of what I am going to design and make • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing 	

					evaluate design ideas and models against a list of design criteria.		
Textiles			<i>Puppets</i>	<i>SAL: cross stitch and applique</i>	<i>SAL: Evaluating fastenings</i>		<i>Waistcoats</i>
Design			Using a template to create a design for a puppet				<ul style="list-style-type: none"> • Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme • Annotating designs
Make			<ul style="list-style-type: none"> • Cutting fabric neatly with scissors • Using joining methods to decorate a puppet • Sequencing steps for construction 	<ul style="list-style-type: none"> • 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 			<ul style="list-style-type: none"> • 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 • Tying strong knots • Decorating a waistcoat -attaching objects using thread and adding a secure fastening • Learning different decorative stitches • Sewing accurately with even regularity of stitches
Evaluate			Reflecting on a finished product, explaining likes and dislikes		<ul style="list-style-type: none"> • 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 		<ul style="list-style-type: none"> • Evaluating work continually as it is created

					different fastening types		
Technical Knowledge			<ul style="list-style-type: none"> • 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 <p>To know that drawing a design idea is useful to see how an idea will look</p>	<ul style="list-style-type: none"> • To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric 	<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 stud and Velcro • To know that different fastening types are useful for different purposes 		<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
Cooking and Nutrition		<i>Fruit and vegetables</i>	<i>SAL: Hidden Sugars</i>	<i>Eating Seasonally</i>	<i>SAL: Following a recipe</i>	<i>What could be healthier?</i>	
Design		<ul style="list-style-type: none"> • Designing smoothie carton packaging by-hand or on ICT software 		<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 		<ul style="list-style-type: none"> • Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • Writing an amended method for a recipe to incorporate the relevant changes to ingredients <p>Designing appealing packaging to reflect a</p>	

						recipe	
Make		<ul style="list-style-type: none"> • 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 		<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Following a baking recipe • Cooking safely, following basic hygiene rules 	<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • Tasting and evaluating different food combinations • Describing appearance, smell and taste • Suggesting information to be included on packaging 		<ul style="list-style-type: none"> • 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 		<ul style="list-style-type: none"> • Identifying the nutritional differences between different products and recipes • Identifying and describing healthy benefits of food groups 	
Cooking and Nutrition Knowledge		<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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' 	<ul style="list-style-type: none"> • 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 exported food is food which has been sent to another country. • To understand that imported foods travel 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 that bacteria and germs have been 	

		<p>or below ground</p> <ul style="list-style-type: none"> To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber) 		<p>from far away and this can negatively impact the environment</p> <ul style="list-style-type: none"> 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"> To know that similar coloured fruits and vegetables often have similar nutritional benefits 		<p>passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects</p>	
Electrical Systems (KS2)					Torches	Electronic Greetings Cards	
Design					<ul style="list-style-type: none"> Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas 	<ul style="list-style-type: none"> 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, purpose and recipient 	
Make					<ul style="list-style-type: none"> Making a torch with a 	<ul style="list-style-type: none"> Making a functional 	

					<p>working electrical circuit and switch</p> <ul style="list-style-type: none"> Using appropriate equipment to cut and attach materials Assembling a torch according to the design and success criteria 	<p>series circuit</p> <ul style="list-style-type: none"> Creating an electronics greeting card, referring to a design criteria Mapping out where different components of the circuit will go 	
Evaluate					<ul style="list-style-type: none"> Evaluating electrical products Testing and evaluating the success of a final product 	<ul style="list-style-type: none"> 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 range of existing greeting cards 	
Technical Knowledge					<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> To know the key components used to create a functioning circuit To know that copper is a conductor and can be used as part of a circuit To understand that breaks in a circuit will stop it from working To understand that a series circuit only has one path for the electrical current to flow from positive to negative 	

					<p>electricity to flow</p> <ul style="list-style-type: none"> • To know that a switch can be used to complete and break an electrical circuit 	<ul style="list-style-type: none"> • To know that we use symbols to represent components in a circuit diagram • To know the names of the components in a basic series circuit: crocodile wires, LED (light-emitting diode), battery holder, battery, cell 	
<p>Additional Knowledge</p>					<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • To know that product analysis is critiquing the strengths and weaknesses of a product • To know that 'mass production' is when a product is made in large quantities by a machine, usually in a factory • To know that one-off production is when only one of a product is made by hand • To know that 'bespoke' means a product was made for a particular reason or person • To understand the development of personal message exchange through to the invention of the Penny Black stamp, and exchanging of greeting cards • To know that a moodboard may include words, sketches, textures, colours, material samples etc. and can act as inspiration 	

						when designing	
Digital World (KS2)				Electronic Charms			Navigating the world
Design				<ul style="list-style-type: none"> • Problem solving by suggesting potential features on a Micro: bit and justifying my ideas • Developing design ideas for a technology pouch • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge 			<ul style="list-style-type: none"> • Writing a design brief from information submitted by a client • Developing design criteria to fulfil the client's request • Considering and suggesting additional functions for my navigation tool • Developing a product idea through annotated sketches • Placing and manoeuvring 3D objects, using CAD • Changing the properties of, or combine one or more 3D objects, using CAD
Make				<ul style="list-style-type: none"> • Using a template when cutting and assembling the pouch • Following a list of design requirements • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch • Applying functional features such as using foam to create soft buttons 			<ul style="list-style-type: none"> • Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo) • Explaining material choices and why they were chosen as part of a product concept • Programming an N,E, S,W cardinal compass
Evaluate				<ul style="list-style-type: none"> • Analysing and evaluating an existing product 			<ul style="list-style-type: none"> • Explaining how my program fits the design criteria and

				<ul style="list-style-type: none"> • Identifying the key features of a pouch 			<p>how it would be useful as part of a navigation tool</p> <ul style="list-style-type: none"> • Developing an awareness of sustainable design • Identifying key industries that utilise 3D CAD modelling and explain why • Describing how the product concept fits the client's request and how it will benefit the customers • Explaining the key functions in my program, including any additions • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch • Demonstrating a functional program as part of a product concept
<p>Technical Knowledge</p>				<ul style="list-style-type: none"> • To understand that in programming a 'loop' is code that repeats something again and again until stopped • To know that a Micro:bit is a pocket-sized, codeable computer • Writing a program to control (button press) 			<ul style="list-style-type: none"> • To know that accelerometers can detect movement • To understand that sensors can be useful in products as they mean the product can function without human input

				and/or monitor (sense light) that will initiate a flashing LED algorithm			
Additional Knowledge				<ul style="list-style-type: none"> • To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result • To know that in Design and technology the term 'smart' means a programmed product • To know the difference between analogue and digital technologies • To understand what is meant by 'point of sale display' • To know that CAD stands for Computer-aided design 			<ul style="list-style-type: none"> • To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request • To know that 'multifunctional' means an object or product has more than one function • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing