



Grayswood CE Primary School Knowledge Progression Map

Subject: Design and Technology

Intent

The National Curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Grayswood CE Primary School deliver a design and technology curriculum which aims to inspire our children to be innovative and creative thinkers who have an appreciation for the product design cycle: ideation, creation and evaluation in order to make purposeful products.

Children's interests are captured through project design briefs, giving them purpose, motivation and meaning for their learning. By providing a supportive and nurturing environment, we want our children to develop the confidence to take risks and achieve their personal best, through drafting design concepts, modelling, and testing and to be reflective learners who can evaluate their work and that of others respectfully. Furthermore, we aim to build an awareness of the impact of design and technology on our lives and encourage children to become resourceful, enterprising citizens who will have the skills to contribute to the design of the future.

The children of Grayswood will have the tools to meet the end of key stage attainment targets in the National curriculum and the aims align with those in the National curriculum.

Enrichment

In addition to the curriculum outlined below, we offer the following enrichment opportunities in Design and Technology for children at Grayswood CE Primary School:

- Community Arts Project: Haslemere Scarecrow Competition
- After school cookery club

	EYFS	Key Stage 1		Key Stage 2			
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures							
Technical	<p>Junk modelling To know there are a range to different materials that can be used to make a model and that they are all slightly different.</p> <p>Making simple suggestions to fix their junk model.</p> <p>Boats To know that 'waterproof' materials are those which do not absorb water.</p>	<p>Constructing a windmill To understand that the shape of materials can be changed to improve the strength and stiffness of structures.</p> <p>To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).</p> <p>To understand that axles are used in structures and mechanisms to make parts turn in a circle.</p> <p>To begin to understand that different structures are used for different purposes.</p> <p>To know that a structure is something that has been made and put together.</p>	<p>Baby bear's chair To know that shapes and structures with wide, flat bases or legs are the most stable.</p> <p>To understand that the shape of a structure affects its strength.</p> <p>To know that materials can be manipulated to improve strength and stiffness.</p> <p>To know that a structure is something which has been formed or made from parts.</p> <p>To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.</p> <p>To know that a 'strong' structure is one which does not break easily.</p> <p>To know that a 'stiff' structure or material is one which does not bend easily.</p>	<p>Constructing a castle To understand that wide and flat based objects are more stable.</p> <p>To understand the importance of strength and stiffness in structures.</p>	<p>Pavilions To understand what a frame structure is. To know that a 'free-standing' structure is one which can stand on its own.</p>		<p>Playgrounds To know that structures can be strengthened by manipulating materials and shapes.</p>
Additional	<p>Boats To know that some objects float and others sink.</p>	<p>To know that a client is the person I am designing for.</p>	<p>To know that natural structures are those found in nature.</p>	<p>To know the following features of a castle: flags, towers, battlements,</p>	<p>To know that a pavilion is a decorative building</p>		<p>To understand what a 'footprint plan' is.</p>

	<p>To know the different parts of a boat.</p>	<p>To know that design criteria is a list of points to ensure the product meets the clients' needs and wants.</p> <p>To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.</p> <p>To know that windmill turbines use wind to turn and make the machines inside work.</p> <p>To know that a windmill is a structure with sails that are moved by the wind.</p> <p>To know the three main parts of a windmill are the turbine, axle and structure.</p>	<p>To know that man-made structures are those made by people.</p>	<p>turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose.</p> <p>To know that a façade is the front of a structure.</p> <p>To understand that a castle needed to be strong and stable to withstand enemy attack.</p> <p>To know that a paper net is a flat 2D shape that can become a 3D shape once assembled.</p> <p>To know that a design specification is a list of success criteria for a product.</p>	<p>or structure for leisure activities.</p> <p>To know that cladding can be applied to structures for different effects.</p> <p>To know that aesthetics are how a product looks.</p> <p>To know that a product's function means its purpose.</p> <p>To understand that the target audience means the person or group of people a product is designed for.</p> <p>To know that architects consider light, shadow and patterns when designing.</p>		<p>To understand that in the real world, design , can impact users in positive and negative ways.</p> <p>To know that a prototype is a cheap model to test a design idea.</p>
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Mechanisms / mechanical systems

<p>Technical</p>			<p>Fairground wheel To know that different materials have different properties and are therefore suitable for different uses.</p>		<p>Making a slingshot car To understand that all moving things have kinetic energy. To understand that kinetic energy is the</p>	<p>Pop up book To know that mechanisms control movement. To understand that mechanisms can be</p>	
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			<p>Making a moving monster</p> <p>To know that mechanisms are a collection of moving parts that work together as a machine to produce movement.</p> <p>To know that there is always an input and output in a mechanism.</p> <p>To know that an input is the energy that is used to start something working.</p> <p>To know that an output is the movement that happens as a result of the input.</p> <p>To know that a lever is something that turns on a pivot.</p> <p>To know that a linkage mechanism is made up of a series of levers.</p>		<p>energy that something (object/ person) has by being in motion.</p> <p>To know that air resistance is the level of drag on an object as it is forced through the air.</p> <p>To understand that the shape of a moving object will affect how it moves due to air resistance</p>	<p>used to change one kind of motion into another.</p> <p>To understand how to use sliders, pivots and folds to create paper-based mechanisms.</p>	
<p>Additional</p>			<p>Fairground wheel</p> <p>To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder.</p> <p>To know that it is important to test my</p>		<p>To understand that products change and evolve over time.</p> <p>To know that aesthetics means how an object or product looks in design and technology.</p>	<p>To know that a design brief is a description of what I am going to design and make.</p> <p>To know that designers often want to hide mechanisms to</p>	

			<p>design as I go along so that I can solve any problems that may occur.</p> <p>Making a moving monster</p> <p>To know some real-life objects that contain mechanisms.</p>		<p>To know that a template is a stencil you can use to help you draw the same shape accurately.</p> <p>To know that a birds-eye view means a view from a high angle (as if a bird in flight).</p> <p>To know that graphics are images which are designed to explain or advertise something.</p> <p>To know that it is important to assess and evaluate design ideas and models against a list of design criteria.</p>	<p>make a product more aesthetically pleasing.</p>	
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Electrical systems (KS2 only)

Technical					<p>Torches</p> <p>To understand that electrical conductors are materials which electricity can pass through.</p> <p>To understand that electrical insulators are materials which electricity cannot pass through.</p> <p>To know that a battery contains stored electricity that can be used to power</p>	<p>Doodlers</p> <p>To know that series circuits only have one direction for the electricity to flow.</p> <p>To know when there is a break in a series circuit, all components turn off.</p> <p>To know that an electric motor converts electrical energy into</p>	
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					<p>products.</p> <p>To know that an electrical circuit must be complete for electricity to flow.</p> <p>To know that a switch can be used to complete and break an electrical Circuit.</p>	<p>rotational movement, causing the motor's axle to spin.</p> <p>To know a motorised product is one which uses a motor to function.</p>	
Additional					<p>To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens.</p> <p>To know facts from the history and invention of the electric light bulb(s) – by Sir Joseph Swan and Thomas Edison.</p>	<p>To know that product analysis is critiquing the strengths and weaknesses of a product.</p> <p>To know that 'configuration' means how the parts of a product are arranged.</p>	

Cooking and nutrition

		<p>Fruit and vegetables Understand the difference between fruits and vegetables.</p> <p>To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).</p> <p>To know that a blender is a machine which mixes ingredients together into a smooth liquid.</p>		<p>Eating Seasonally To know that not all fruits and vegetables can be grown in the UK.</p> <p>To know that climate affects food growth.</p> <p>To know that vegetables and fruit grow in certain seasons.</p> <p>To know that cooking instructions are known as a 'recipe'.</p>		<p>What could be healthier? To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues.</p> <p>To know that I can adapt a recipe to make it healthier by substituting ingredients.</p>	
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		<p>To know that a fruit has seeds and a vegetable does not.</p> <p>To know that fruits grow on trees or vines.</p> <p>To know that vegetables can grow either above or below ground.</p> <p>To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).</p>		<p>To know that imported food is food which has been brought into the country.</p> <p>To know that exported food is food which has been sent to another country.</p> <p>To understand that imported foods travel from far away and this can negatively impact the environment.</p> <p>To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.</p> <p>To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.</p> <p>To know safety rules for using, storing and cleaning a knife safely.</p> <p>To know that similar coloured fruits and vegetables often</p>		<p>To know that I can use a nutritional calculator to see how healthy a food option is.</p> <p>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.</p>	
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				have similar nutritional benefits.			
Textiles							
	<p>Bookmarks</p> <p>To know that a design is a way of planning our idea before we start.</p> <p>To know that threading is putting one material through an object.</p>	<p>Puppets</p> <p>To know that 'joining technique' means connecting two pieces of material together.</p> <p>To know that there are various temporary methods of joining fabric by using staples, glue or pins.</p> <p>To understand that different techniques for joining materials can be used for different purposes.</p> <p>To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.</p> <p>To know that drawing a design idea is useful to see how an idea will look.</p>					<p>Waistcoats</p> <p>To understand that it is important to design clothing with the client/ target customer in mind.</p> <p>To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.</p> <p>To understand the importance of consistently sized stitches.</p>
Digital world (KS2 only)							
Technical				<p>Electronic charm</p> <p>To understand that in programming a 'loop' is code that repeats something again and again until stopped</p>			<p>Navigating the world</p> <p>To know that accelerometers can detect movement</p> <p>To understand that sensors can be useful</p>

				<p>To know that a Micro:bit is a pocket-sized, codeable computer</p> <p>Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm</p>			<p>in products as they mean the product can function without human input</p>
Additional				<p>To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result</p> <p>To know that in Design and technology the term 'smart' means a programmed Product</p> <p>To know the difference between analogue and digital technologies</p> <p>To understand what is meant by 'point of sale display'</p> <p>To know that CAD stands for Computer-aided design</p>			<p>To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request</p> <p>To know that 'multifunctional' means an object or product has more than one function</p> <p>To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing</p>