



Goldenhill Primary Academy

Curriculum Progression Map - Design & Technology

		Nursery	Reception
Expressive Arts and Design		Expressive Arts and Design <i>Creating with Materials</i> <i>Being Imaginative and Expressive</i> Explore different materials freely, Further develop their own ideas and then decide which materials to use to express them. Join different materials and explore different textures. Create closed shapes with continuous lines, and begin to use these shapes to represent objects. Draw with increasing complexity and detail, such as representing a face with a circle and including details. Explore colour and colour-mixing. Take part in simple pretend play, using an object to represent something else even though they are not similar. Begin to develop complex stories using small world equipment Make imaginative and complex 'small worlds' with blocks and construction kits	Expressive Arts and Design <i>Creating with Materials</i> Explore, use and refine a variety of artistic effects to express their ideas and feelings. Create collaboratively sharing ideas, resources and skills. <u>Creating with Materials – key skills</u> <i>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</i> <i>Share their creations, explaining the process they have used.</i> <i>Make use of props and materials when role playing characters in narratives and stories.</i> <u>Being Imaginative and Expressive - Key skills</u> <i>Invent, adapt and recount narratives and stories with peers and their teacher.</i>
Understanding the World		<i>Understanding the World</i> <i>Past and Present</i> <i>The Natural World</i> Begin to make sense of their own life-story and family's history. Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Show interest in different occupations. Explore how things work. Understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.	<i>Understanding the World</i> <i>People, Culture and Communities</i> <i>Past and Present</i> <i>The Natural World</i> Talk about members of their immediate family and community. Draw information from a simple map. Understand that some places are special to members of their community. Recognise that people have different beliefs and celebrate special times in different ways. Recognise some similarities and differences between life in this country and life in other countries. Recognise some environments that are different to the one in which they live. Comment on images of familiar situations in the past. Compare and contrast characters from stories, including figures from the past. Explore the natural world around them. Describe what they see, hear and feel whilst outside. . Understand the effect of changing seasons on the natural world around them. <u>Past and Present – key skills</u> <i>Talk about the lives of the people around them and their roles in society.</i> <i>Know some similarities and differences between things in the past and now,</i> <i>Understand the past through settings, characters and events encountered in books read in class and storytelling</i>
Physical Development		<i>Physical Development</i> <i>Gross Motor Skills</i> <i>Fine Motor Skills</i> Use large-muscle movements to paint and make marks. Match their developing physical skills to tasks and activities in the setting Choose the right resources to carry out their own plan. Collaborate with others to manage large items, such as moving a long plank safely, carrying large hollow blocks. Use one-handed tools and equipment, for example, making snips in paper with scissors. Use a comfortable grip with good control when holding pens and pencils. .Show a preference for a dominant hand.	<u>People, Culture and Communities – key skills</u> <i>Describe their immediate environment .</i> <i>Explain some similarities and differences between life in this country and life in other countries.</i> <u>The Natural World – key skills</u> <i>Explore the natural world around them.</i> <i>Know some similarities and differences between the natural world around them and contrasting environments</i> <i>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</i>
Communication and Knowledge		<i>Communication and Language</i> <i>Listening and Attention</i> <i>Speaking</i> Understand and follow a question or instruction that has two parts. Understand 'why' questions. Can hold a conversation with an adult or a friend and continue it for 5 turns. Use talk to organise themselves and their play: "Let's go on a bus... you sit there... I'll be the driver."	<i>Communication and Language</i> <i>Gross Motor Skills</i> <i>Fine Motor Skills</i> <u>Gross Motor Skills – key skills</u> <i>Negotiate space and obstacles safely, with consideration for themselves and others.</i> <u>Fine Motor Skills</u> <i>Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases.</i> <i>Use a range of small tools, including scissors and paintbrushes.</i> <i>Begin to show accuracy and care when drawing.</i>



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			<i>Listening and Attention Speaking</i> Be able to sit and listen to stories or an adult talking for up to 20 minutes Learn and use the new vocabulary they have learned in all areas of the curriculum and in different contexts Listen to and talk about selected non-fiction to develop a deep familiarity with new knowledge and vocabulary. Be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions. Ask and understand questions. Begin to connect one idea or action to another using a range of connectives – and, because. Describe past events of personal significance in increasing detail <u>Listening and Attention – Key Skills</u> <i>To be able to listen attentively and respond to what they hear with relevant questions, comments and actions in a range of situations.</i> <i>Make comments about what they have heard and ask questions to clarify their understanding.</i> <i>Hold conversation when engaged in back-and-forth exchanges with their teacher and peers.</i> <u>Speaking – Key skills</u> <i>Participate in small group, class and one-to-one discussions</i> <i>Give own ideas</i> <i>Offer explanations for why things might happen,</i> <i>Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher.</i>
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Learning Intention Knowledge

Progression of skills and knowledge - D+T Structures

Skills	Structures	Year 1 Constructing a Windmill	Year 2 Baby Bear's Chair	Year 3 Constructing a Castle	Year 4 Pavilions	Year 5 N/A	Year 6 Playgrounds
	Design	- Learning the importance of a clear design criteria - Including individual preferences and requirements in a design	Generating and communicating ideas using sketching and modelling	- 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 designed to support weight	- Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect - Building frame structures designed to support weight		Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs



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	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 • 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	• Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials	• Creating a range of different shaped frame structures • Making a variety of free standing frame structures of different shapes and sizes • Selecting appropriate materials to build a strong structure and for the cladding • Reinforcing corners to strengthen a structure • Creating a design in accordance with a plan • Learning to create different textural effects with materials		• 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	• 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	• Testing the strength of own structures • Identifying the weakest part of a structure • Evaluating the strength, stiffness and stability of own structure	• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design • Suggesting points for modification of the individual designs	• Evaluating structures made by the class • Describing what characteristics of a design and construction made it the most effective • Considering effective and ineffective designs		• 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
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.	• 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	• To understand that wide and flat based objects are more stable • To understand the importance of strength and stiffness in structures	• To understand what a frame structure is • To know that a 'free-standing' structure is one which can stand on its own		• To know that structures can be strengthened by manipulating materials and shapes
	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	N/A	• 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 know that a pavilions ia 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		• 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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		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		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	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		
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Progression of skills and knowledge - D+T Mechanisms/Mechanical Systems							
Skills	Mechanisms /Mechanical Systems	Year 2 Fairground Wheel	Year 2 Moving Monster	Year 3	Year 4 Making a Slingshot Car	Year 5 Pop-up book	Year 6
	Design	• Selecting a suitable linkage system to produce the desired motions • Designing a wheel • Selecting appropriate materials based on their properties	• Creating a class design criteria for a moving monster • Designing a moving monster for a specific audience in accordance with a design criteria		• Designing a shape that reduces air resistance • Drawing a net to create a structure from • Choosing shapes that increase or decrease speed as a result of air resistance • Personalising a design	• 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	• Selecting materials according to their characteristics • Following a design brief	• 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		• Measuring, marking, cutting and assembling with increasing accuracy • Making a model based on a chosen design	• Following a design brief to make a pop up book, neatly and with focus on accuracy • Making mechanisms and/or structures using sliders, pivots and folds to produce movement • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result	
	Evaluate	• Evaluating different designs • Testing and adapting a design	• Evaluating own designs against design criteria • Using peer feedback to modify a final design		• Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance	N/A	



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Knowledge	Technical	• To know that different materials have different properties and are therefore suitable for different uses	• 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		• 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 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	
	Additional	• 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 objects that contain mechanisms		• 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 evaluate design ideas and models against a list of design criteria.	• 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	

Progression of skills and knowledge - D+T Electrical Systems (KS2 only)

Skills	Electrical Systems (KS2 only)	Year 1	Year 2	Year 3	Year 4 Torches	Year 5 Doodlers	Year 6



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	Design				Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas	- Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product - Developing design criteria based on finding from investigating existing products - Developing design criteria that clarifies the target user	
	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	- Altering a product's form and function by tinkering with its configuration - Making a functional series circuit, incorporating a motor - Constructing a product with consideration for the design criteria - Breaking down the construction process into steps so that others can make the product	
	Evaluate				Testing and evaluating the success of a final product and taking inspiration from the w	- Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses - Determining which parts of a product affect its function and which parts affect its form - Analysing whether changes in configuration positively or negatively affect an existing product - Peer evaluating a set of instructions to build a product	
Knowledge	Technical				- 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	- To know that series circuits only have one direction for the electricity to flow - To know when there is a break in a series circuit, all components turn off - To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin - To know a motorised product is one which uses a motor to function	
	Additional				To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens	- To know that product analysis is critiquing the strengths and weaknesses of a product - To	



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					To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison	know that 'configuration' means how the parts of a product are arranged	
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Progression of skills and knowledge - D+T Cooking & Nutrition							
Skills	Cooking & Nutrition	Year 1 Fruit & Vegetables	Year 2	Year 3 Eating Seasonally	Year 4	Year 5 What could be healthier?	Year 6
	Design	Designing smoothie carton packaging by-hand or on ICT software		Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish		- 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	- 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		- 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		- 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	



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Knowledge	Evaluate	• Tasting and evaluating different food combinations • Describing appearance, smell and taste • Suggesting information to be included on packaging		• Describing the benefits of seasonal fruits and vegetables and the impact on the environment • Suggesting points for improvement when making a seasonal tart		• Identifying the nutritional differences between different products and recipes • Identifying and describing healthy benefits of food groups	
	Cooking & Nutrition	• 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 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 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		• 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 passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects	



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Progression of skills and knowledge - D+T Textiles							
Skills	Textiles	Year 1 Puppets	Year 2	Year 3	Year 4	Year 5	Year 6 Waistcoats
	Design	Using a template to create a design for a puppet					- Designing a waistcoat in accordance to specification linked to set of design criteria to fit a specific theme - Annotating designs
	Make	- Cutting fabric neatly with scissors - Using joining methods to decorate a puppet - Sequencing steps for construction					- 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					Evaluating work continually as it is created
Knowledge	Technical	- 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					- 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



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		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					
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Progression of skills and knowledge - D+T Digital World							
Skills	Digital World	Year 1	Year 2	Year 3 Electronic Charm	Year 4	Year 5	Year 6 Navigating the World
	Design			- 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			- 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			- 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			- 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



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Knowledge	Evaluate			- Analysing and evaluating an existing product - Identifying the key features of a pouch			- Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool - 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
	Technical			- 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) and/or monitor (sense light) that will initiate a flashing LED algorithm			- 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
	Additional			- 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			- 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

Our curriculum offers full coverage of the KS1 and KS2 Design & Technology curriculum and we have categorised our content into five areas:



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- Structures
 - Mechanisms/ Mechanical systems
 - Cooking and Nutrition
 - Textiles
 - Electrical Systems (**Key Stage 2 only**)
 - Digital World (**Key Stage 2 only**)
- There are five strands that run through each topic which are Design, Make, Evaluate and Technical Knowledge and **cooking and nutrition.**