



Bearwood Primary and Nursery School

Design and Technology Progression of Knowledge



'Learning, Enjoying and Succeeding Together'

The iterative process of designing, making and evaluating products is at the core of each unit of teaching.

<p><u>Design and Technology Context: National Curriculum</u></p> <p>Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.</p>	<p><u>National Curriculum KS1:</u></p> <p>Design *design purposeful, functional, appealing products for themselves and other users based on design criteria *generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology</p> <p>Make *select from and use a range of tools and equipment to perform practical tasks *select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics</p> <p>Evaluate *explore and evaluate a range of existing products *evaluate their ideas and products against design criteria</p> <p>Technical Knowledge *build structures, exploring how they can be made stronger, stiffer and more stable *explore and use mechanisms, in their products.</p> <p>Cooking & Nutrition *use the basic principles of a healthy and varied diet to prepare dishes *understand where food comes from.</p>	<p><u>National Curriculum KS2:</u></p> <p>Design *use research and develop design criteria to inform the design of innovative, functional, appealing products that 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</p> <p>Make *select from and use a wider range of tools and equipment to perform practical tasks 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</p> <p>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</p> <p>Technological Knowledge *apply their understanding of how to strengthen, stiffen and reinforce more complex structures *understand and use mechanical systems in their products *understand and use electrical systems in their products *apply their understanding of computing to programme, monitor and control their products.</p> <p>Cooking & Nutrition *understand and apply the principles of a healthy and varied diet *cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet *become competent in a range of cooking techniques [for example, selecting and preparing ingredients; using utensils and electrical equipment; applying heat in different ways; using awareness of taste, texture and smell to decide how to season dishes and combine ingredients; adapting and using their own recipes *understand the source, seasonality and characteristics of a broad range of ingredients</p>
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Food and Nutrition	<p>Name a variety of fruits and vegetables.</p> <p>Articulate which they like and don't like.</p> <p>Sort some foods into healthy and unhealthy choices.</p> <p>Use a knife to spread butter and create a sandwich.</p> <p>Use a spoon to mix ingredients and hands when needed eg – to make a dough base.</p> <p>Learn how to mash a potato.</p> <p>Use a knife and fork when eating.</p>	<p>Name a wider variety of fruits and vegetables and use adjectives to describe their taste and texture.</p> <p>Know that some need to be cut, peeled, grated before they can be eaten.</p> <p>Understand basic hygiene: washing hands, tying long hair back, keeping surfaces clean.</p> <p>Use a knife to cut some fruits and vegetables in different ways and a grater on, for example an apple of carrot.</p> <p>Peel for example a banana or apple.</p>	<p>Name a variety of pizza toppings.</p> <p>Use the model of a balanced plate to decide how healthy pizzas are.</p> <p>Explore different types of bread and evaluate which would be best for a pizza base.</p> <p>Identify which food groups a variety of toppings come from.</p> <p>Explain why each of the food groups is important for a balanced diet.</p> <p>Design and make a healthy pizza following given criteria.</p> <p>Evaluate the finished product.</p>	<p>Explain what "seasonal food" means.</p> <p>Know that different parts of the world have different seasonal food.</p> <p>Discuss the benefits and problems of unseasonal food being available in shops all year round.</p> <p>Know that some food, like wheat, is available all year round in the UK.</p> <p>Practise skills like slicing, dicing, beating, whisking, folding sieving, grating.</p> <p>Know how producers can speed up or slow down the ripening process to make food available all year round.</p> <p>Describe the cycle of wheat production in the UK.</p> <p>Follow recipes to make fairy cakes, fruit tarts, stuffed peppers and meatballs.</p> <p>Know about some vegetarian options</p>	NA	NA	<p>Know that most foods have labels to help us make informed choices.</p> <p>Know that calories come from fats, proteins and carbohydrates.</p> <p>Evaluate how healthy a burger is based on the nutrition label and can compare different burgers.</p> <p>Explain different ways burger patties are cooked.</p> <p>Follow a recipe to cook a beef, turkey or veggie burger and a variety of sauces.</p> <p>Add ingredients to reflect global cuisine.</p> <p>Design a burger menu to incorporate a variety of burgers, sides and sauces.</p> <p>Explore assess and offer suggestions for the bread to be used and some alternatives.</p> <p>Add mixture of herbs and spices to bread dough.</p> <p>Design a burger for a particular purpose.</p> <p>Design a burger for someone with dietary requirements.</p>

				<p>which provide the same nutrients as meat.</p> <p>Explain how fish are caught processed and used in healthy meals.</p> <p>Design a healthy meal and menu.</p>			<p>Make and evaluate my designed burger.</p>
Stable structures	<p>Know that a structure is something that they can walk around.</p> <p>Know that a structures is something that can stand up.</p> <p>Explore and create structures from a variety of materials including junk / recyclable materials.</p> <p>Explore different glues eg; glue sticks compared to PVA.</p>	<p>Identify features of a toy garage.</p> <p>Know what the word stable means.</p> <p>Make changes to the design of a stable structure to make it fit for purpose.</p> <p>Explore and analyse a range of materials and their properties for a particular project.</p> <p>Explore how to make stable structures that hold a given object.</p> <p>Follow a design to make a stable structure and know some ways to make it more stable.</p> <p>Evaluate finished structure against given criteria.</p>	NA	<p>Know what a greenhouse is and how they work.</p> <p>Explore a range of different greenhouses.</p> <p>Explain how the shape of a structure affects its stability.</p> <p>Know that the weight of a structure needs to be evenly spaced at the base and know that the wider the base, the more stable the structure.</p> <p>Use 3D nets to explore structures for a greenhouse.</p> <p>Add triangles at the joins or insert dowelling to make a structure more stable.</p> <p>Design a mini greenhouse using specific design criteria.</p> <p>Select appropriate</p>	<p><i>Through British Inventors unit in Spring term</i> Explain how concrete is used to make structures more stable.</p> <p>Create a structure strong enough to hold an object (eg dictionary) using just newspaper and tape.</p>	<p>Know what beams and pillars are and how they are used in bridge construction.</p> <p>Predict which beams will be strongest for the cross-section. Test the strength of different beam shapes using paper and card.</p> <p>Explain what a truss is and how they make bridges stronger.</p> <p>Identify the 3 main types of trusses used in bridges.</p> <p>Build a truss bridge spanning 40cm using paper straws.</p> <p>Use a fair test to evaluate the strength of the bridge made.</p> <p>Explain how arches work to make bridges stronger.</p> <p>Test the arch</p>	<p>Investigate a variety of bird houses.</p> <p>Identify what materials have been used and suggest how they have been joined together.</p> <p>Know what a flat pack diagram is and use it to identify each part of a structure.</p> <p>Create a flat pack diagram of a bird house.</p> <p>Draw an exploded diagram.</p> <p>Measure, clamp, saw, sand and join wood.</p> <p>Use a hand drill.</p> <p>Know the safety rules when working with wood.</p> <p>Design a bird house for a particular bird thinking about needs.</p> <p>Select appropriate tools and materials to use.</p> <p>Create a stable bird house from wood.</p>

				<p>tools and materials to make the greenhouse.</p> <p>Evaluate finished product for stability, effectiveness and visual appeal.</p>		<p>heights to see which will bear the most load.</p> <p>Make an arch frame.</p> <p>Explain how suspension bridges use tension forces to work.</p> <p>Design , make and evaluate a suspension bridge using 1:100 according to specific design criteria.</p>	<p>Evaluate the finished product taking into account the views of others to improve work.</p>
<p>Programming and electrical systems.</p>	NA	NA	NA	NA	<p>Explore and analyse illuminated signs.</p> <p>Create a simple circuit.</p> <p>Make a circuit with a string of LED lights.</p> <p>Design an illuminated light box against given criteria.</p> <p>Select materials, tools and components to create a free standing structure to house an electrical unit.</p> <p>Strip, twist and join wire to make permanent connections.</p> <p>Evaluate the effectiveness of finished project.</p>	NA	<p>Explore how computers can be used in a variety of products.</p> <p>Explain how memory chips work to store information.</p> <p>Write an algorithm.</p> <p>Know what a computer engineer does.</p> <p>Describe how hardware and software specialist work together to create new products.</p> <p>Develop and build a product using computer programming.</p> <p>Develop and communicate ideas for a system which monitors and controls a door or room.</p>

							Debug errors in an algorithm and suggest ways to change it to improve a system. Evaluate own design for a computer controlled system.
Mechanical systems	To explore using a range of construction kits which include moving pieces eg; wheels.	Make a sliding mechanism out of card. Know what a pivot and lever are. Make a pivot and lever using card and a split pin. Match a mechanism to the type of movement they make. Design a moving mini-beast picture to include a variety of mechanisms. Follow a design for a particular purpose. Evaluate finished product.	Investigate a range of vehicles and label the parts. Know what an axel is. Know what a chassis is. Explore different ways of using axels and wheels. Design a vehicle with wheels, axels and a chassis. Follow a design to make a moving vehicle. Evaluate finished product.	Explore moving parts in storybooks, suggest how they work and explain their purpose. Explain the words linkage, pivot, rotate and lever. Use a paper concertina to make an object pop out of a book. Use levers to create moving parts. Create moving wheel mechanisms. Experiment with different fonts and graphic design features. Design pages of a storybook to include moving mechanisms and graphic features. Evaluate how well moving mechanisms work.	NA	<i>Within Chinese inventions.</i> Explore how different transmissions create different movements. Use a crank to change the motion from circular to linear.	NA
Textiles	NA	NA	Explore a variety of puppets and label their features. Cut out felt using a	NA	Explain the difference between the function and visual appeal of a	Explain the process of turning raw cotton into cloth. Know that products	NA

			<p>simple template. Stick pieces of felt together to make a finger puppet. Add pieces of material to a finger puppet to create features. Use a running stitch to join 2 pieces of material together. Use an overstitch to join 2 pieces of material together. Sew a button onto a piece of fabric. Design a glove puppet for a particular purpose. Follow a design to make a glove puppet. Evaluate finished product.</p>		<p>product. Evaluate the function and visual appeal of a variety of Christmas stockings. Use pins to fasten pieces of material together. Use a running stitch, back stitch, overstitch and zigzag stitch to join pieces of fabric. Hide the finishing knot. Sew a button, bead or sequin onto a piece of fabric. Design a Christmas stocking. Use a template to cut front and back pieces. Evaluate the finished product.</p>	<p>that are woven together are called textiles. Identify straight stitch, zigzag stitch, whip / blanket stitch, blind stitch, buttonhole stitch and overlock stitch. Describe the job of a fashion designer. Sew a basting, whip and back stitch. Sew a hem. Know what a pattern piece is and why they are important. Design a drawstring bag including the pattern pieces. Make the drawstring bag using a variety of techniques. Evaluate finished product.</p>	
Inventions and achievements.	NA	NA	NA	NA	<p>Explain about the invention of the mackintosh. Investigate ways of making fabric waterproof. Explain about the invention of the world wide web. Describe how the invention of the internet has changed the world.</p>	<p>Explain how the invention of paper helped change the world. Explain the traditional method of making paper. Test a variety of papers for strength, absorbency, opacity etc. Make recycled paper.</p>	

						<p>Know how gunpowder was invented and explain how it shaped the world. Make a hanging / floating compass. Design own compass. Explain what water-powered machines are and how they helped change the world. Explain why kites were invented and how they were made. Make a variety of kite prototypes and test them. Design, make and evaluate own kite.</p>	
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