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Design and Technology Curriculum Led by: Sam James

Why do we teach DT?	How is DT sequenced within our school?	What will our children learn?
• We teach DT at Beechwood to help our children to learn how to be imaginative, curious and to explore in a range of different contexts and practical ways. • To help children to develop the knowledge they need to draw upon to be able to solve a range of problems and to design a product for a purpose. • It links together skills learned in subjects such as maths, science, computing and art. • It helps our children to become risk takers in a safe environment and life skills such as sewing and how to cook healthy food choices. • In DT we know that the knowledge and skills they learn will help them to become creative, resilient and self-reliant members of the community.	• Within Beechwood DT is sequenced across the Key Stage with each unit of work building on prior learning within that year group but also within the year groups before. This includes looking at the KS1 curriculum. • The DT in each year group is split up into 3 ½ term units and DT is alternated with Art. This is to allow for more depth in the learning through longer lessons and more chances to retrieve and revisit learning across the year and Key Stage. • The curriculum is split into Textiles, Food Technology and Structures. • Each unit also follows a cycle which incorporates different ways of learning procedural knowledge, generating ideas, designing, making and evaluating a product. • We have used the DT association to support our sequencing.	• How to develop and refine a design for a particular purpose or person. • How to share, model and communicate their ideas through discussions. • How to present ideas in different ways including through different drawings and using CAD. • How to use a range of different tools and equipment such as tools for cutting, joining, chopping and mixing. How to evaluate their own product and reflect on how to improve for next time. • To understand how DT relates to the wider world and study the work of engineers and chefs. • To understand what a healthy and varied diet might be and how to make different savoury dishes.

Concept Map

Concepts	Components
Designers and Inventors	• Who were they? (Biographical knowledge) • Characteristics • Techniques
Generating Ideas	• Scrapbooking • Looking and talking • Experimenting • Making a proposal
Making	Materials and Techniques in… • Structures and Mechanisms • Textiles • Electronic/ Electronical Devices • Food Technology
Evaluating	• Use of techniques • The product • Identify similarities and differences to others' work • Reflecting

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2023-2024	Autumn	Spring	Summer
Year 3	Structural and Mechanical Systems Product: Moving Card	Textiles and Structures Product: Net box with a 3D Product	Food Technology Product: Healthy Wraps and dips
Year 4	Textiles with Electrics Product: Christmas decoration with an electrical LED light and circuit contained within	Food Technology Product: Making a pizza healthier	Structures Product: A pneumatic toy
Year 5	Textiles Product: Bag making	Food Technology Product: Soup	Structure and Mechanical Systems: CAM Toy
Year 6	Food Technology Product: Scones that meet different dietary requirements and restrictions	Structures with Electrics Products: Doodlers	Textiles Product: Make do and Mend – linked to WW2

Structures/ mechanisms	Year 2	Year 3	Year 4	Year 5	Year 6
Design	• Learning about different types of structures, found in the natural world and in everyday objects				• Giving careful consideration to how the structures will be used
	• Designing as a class	• Developing design criteria from a design brief	• Designing a product and personalising it for an individual, based on their need.	Designing a product and experiment with different moving parts to create the desired movement of the product.	Designing an electric game featuring a variety of different structures considering effective and ineffective designs
	• Generating and communicating ideas using sketching and modelling	• Generating ideas using thumbnail sketches and exploded diagrams	• Learning that different types of drawings are used in design to explain ideas clearly	Understanding and drawing cross-sectional diagrams to show the inner-workings of the automata	
		• Designing a pop-up product which uses a mixture of structures and mechanisms	• Designing a product which uses a pneumatic system	Understanding how linkages change the direction of a force	

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		• Designing and/or decorating on CAD software • Drawing and labelling your product using 2D shapes, labelling: the 3D shapes that will create the features.	• Drawing a net to create a structure from		
Make		• Selecting appropriate tools and equipment for particular tasks	• Explaining why selecting appropriating materials is an important part of the design process	• Using the correct techniques to saws safely • Understanding basic wood functional properties	
	• Cutting and assembling components neatly	• Manipulating materials to create different effects by cutting, creasing, folding, weaving	• Measuring, marking, cutting and assembling with increasing accuracy	• Measuring, marking and checking the accuracy dowel pieces required accurately using a ruler and scissors • Measuring, marking and cutting wood to create a range of structures	• Measuring, marking and cutting components using a range of materials and patterns
	• Selecting materials according to their characteristics	• Selecting materials due to their functional and aesthetic characteristics			• Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set
	• Following a design brief	Constructing a range of 3D geometric shapes using nets	• Making a model based on a chosen design	• Following a design brief to make a product, neatly and with focus on accuracy	
		• Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result	• Using syringes and balloons to create different types of pneumatic systems to make a functional and appealing pneumatic toy	• Using a range of materials to reinforce and add decoration to structures	•To select a range of materials to reinforce and add decoration to structures using a variety of stitches.
Evaluation	• Exploring the features of structures	• Comparing the stability of different shapes • Testing the strength of own structures	• Using peer feedback to modify a final design	•Testing and adapting a design	• Identifying what makes a successful structure • Applying points of improvements • Describing changes they would make/do if they were to do the project again
	• Evaluating own designs against design criteria	• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design	• Evaluating the speed of a final product based on: the effect of shape on speed and	• Evaluating the work of others and receiving feedback on own work and suggesting points for improvement for own product.	• Evaluating the work of others and receiving feedback on own work and improving a design plan based on peer evaluation

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			the accuracy of workmanship on performance		
		• Suggesting points for modification of the individual designs	• Describing what characteristics of a design and construction made it the most effective		
		• Testing and modifying the outcome, suggesting improvements	• Considering effective and ineffective designs	• Adapting and improving own product by identifying points to improve.	• Testing and adapting a design to improve it as it is developed
Knowledge	• Learning that mechanisms are a collection of moving parts that work together in a machine • Learning that there is an input and output in a mechanism • Identifying mechanisms in everyday objects • Learning that a lever is something that turns on a pivot • Learning that a linkage is a system of levers that are connected by pivots • Learning how axels help wheels to move a vehicle • Identifying natural and man-made structures • Knowing that shapes and structures with wide, flat bases or legs are the most stable • Understanding that the shape of a structure affects its strength	I know that mechanisms are a system of parts that work together to create motion I know that all moving things have kinetic energy I can Identify suitable materials to be selected and used considering weight, compression, tension I know that wide and flat based objects are more stable I know the difference between frame and shell structure I can design a product that looks attractive I know how to choose material for both its suitability and appearance I can explain how to improve a finished model I know why a model has or hasn't been successful. I know how to identify areas of a structure which need more support. I can use a simple IT system within the design.	I know how pneumatic systems work And how they can be used as part of a mechanism I know that pneumatic systems force air over a distance to create movement I know how to communicate ideas in a range of ways, including sketching and drawings which are annotated. I can measure accurately I can evaluate and suggest improvements for a design. I can use IT where appropriate to add to the quality of the product.	I know that different shaped cams produce different follower movements I know different ways to reinforce structures I can come up with a range of ideas after collecting information from different sources. I know how to explain how a product will appeal to a specific audience I can design a product the requires pulleys or gears. I can work accurately to mark, make cuts and make holes. I know which tool to use and show knowledge of handling the tool I can suggest alternative plans; outline the positive features and drawbacks of the product. I can name each mechanism, input and output accurately•	I can identify the shell structure in everyday life (cars, aeroplanes, tins, cans) I know the difference between man-made and natural structures I know that culture and society is considered in plans and designs. I know how to justify planning in a convincing way I can make a product that uses both electrical and mechanical components. I know which tool you use for a particular task and why I can explain how products should be stored and give reasons I know how to evaluate a product against clear criteria. I know how to improve a made product by strengthening, stiffening or reinforcing.
Textiles	Year 2	Year 3	Year 4	Year 5	Year 6
Design	Using a template to create a design	• Designing and making a template applying individual design criteria	• Writing design criteria for a product, articulating decisions made	• Designing a product considering the main component shapes required and creating an appropriate template	• Designing a product in accordance to specification linked to set of design criteria to fit a specific theme • Annotating designs

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				• Considering the proportions of individual components	
Make	• Selecting and cutting fabrics for sewing • Cutting fabric neatly with scissors	• Selecting and cutting fabrics with ease using fabric scissors	• Measuring, marking and cutting fabric using a paper template	• Measuring, marking and cutting fabric accurately and independently	• Marking and cutting fabric accurately, in accordance with a design
	• Sequencing steps for construction	• Following design criteria to create your product	• Making and testing a paper template with accuracy and in keeping with the design criteria		
	• Decorate using fabric glue or running stitch	• Sewing cross stitch to join fabric	• Selecting a stitch style to join fabric, working neatly sewing small neat stitch. Applying a blanket stitch to join fabric	Applying blanket stitch so the space between the stitches are even and regular • Creating strong and secure blanket stitches when joining fabric	• Sewing a strong running stitch, making small, neat stitches and following the edge • Sewing accurately with even regularity of stitches Learning different decorative stitches
		• Decorating fabric using appliqué		• Using applique to attach pieces of fabric decoration	
		• Completing design ideas with stuffing and sewing the edges		• Incorporating fastening to a design	• Attaching objects using thread and adding a secure fastening
Evaluation	• Evaluating the quality of the stitching on others' work				
	• Troubleshooting scenarios posed by teacher	• Evaluating an end product and thinking of other ways in which to create similar items	• Testing and evaluating an end product against the original design criteria • Suggesting modifications for improvement	• Testing and evaluating an end product and giving point for further improvements	• Evaluating work continually as it is created
	• Discussing as a class, the success of their stitching against the success criteria				

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	• Identifying aspects of their peers' work that they particularly like	• Testing and evaluating an end product against the original design criteria	• Deciding how many of the criteria should be met for the product to be considered successful		
Technical knowledge	• Joining items using fabric glue or stitching Identifying benefits of	I can thread needles with greater independence I can tie knots with greater independence I know that fabrics can be layered for affect I can prove that a design meets set criteria I know how to select the most appropriate tools and technique for a given task I can explain how to improve a finished model I Know why a model has or hasn't been successful.	I can thread needles independently I can produce a plan and explain it. I can persevere and adapt work when original ideas do not work. I know which materials are likely to give the best outcome. I can evaluate a product for both appearance and purpose. I can evaluate how the original idea has been improved	I know that there are different types of fastenings and what they are I know the benefits and disadvantages of different fastening types I can produce a detailed step by step plan. I can explain how a product will appeal to a specific audience. I can evaluate the functionality and appearance against original criteria.	I can use market ideas to inform plans and ideas. I know how to follow and refine original plans. I can justify planning in a convincing way I know how to test and evaluate designed products
Cooking and nutrition	Year 2	Year 3 – Pitta bread sandwiches	Year 4 – Healthy pizza	Year 5 – Soup	Year 6 Making bread
Design	• Designing a healthy snack based on a food combination which work well together	• Creating a healthy and nutritious snack using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.	• Designing a pizza within a given budget, drawing upon previous taste testing	• Writing a recipe, explaining the key steps, method and ingredients • Including facts and drawings from research undertaken	• 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
Make		•Preparing themselves and a work space to prepare food safely in, learning the basic rules to avoid food contamination	• Cooking safely, following basic hygiene rules	• Knowing how to avoid cross-contamination	• Working safely and hygienically with independence
	• Slicing food safely using the bridge or claw grip	• Cutting and preparing vegetables safely Using equipment safely, including knives	• Using equipment safely, including knives and an oven.	• Using equipment safely, including knives, hot pans and hobs	

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			• Following a baking recipe • Following the instructions within a recipe	• Following a step by step method carefully to make a recipe	• Following a recipe, including using the correct quantities of each ingredient • Adapting a recipe based on research
					• Working to a given timescale
Evaluation	• Describing the information that should be included on a label			• Identifying and describing healthy benefits of food groups	
	• Describing the taste, texture and smell of fruit and vegetables • Taste testing food combinations and final products	• Describing the benefits of seasonal fruits and vegetables and the impact on the environment	• Describing the impact of the budget on the selection of ingredients • Evaluating a recipe, considering: taste, smell, texture and appearance	• Identifying the nutritional differences between different products and recipes	• Taste testing and scoring final products
		• Establishing and using design criteria to help test and review dishes and making suggestions points for improvement	• Evaluating and comparing a range of products • Suggesting modifications		• Evaluating a recipe, considering: taste, smell, texture and origin of the food group • Suggesting and writing up points of improvements in productions
		• Evaluating safe use of knives	• Evaluating safe use of ovens and hygiene	• Evaluating safe use of hot pans and hobs and hygiene	• Evaluating health and safety in production to minimise cross contamination
Knowledge	• Understanding what makes a balanced diet • Knowing where to find the nutritional information on packaging • Knowing the five food groups	• I know that climate affects food growth • I know that each fruit and vegetable gives us nutritional benefits • I can explain which foods are healthy • I can explain which foods are less healthy. • I know when food is nearly ready for harvesting • I know how to be hygienic when preparing and handling food.	• I know that imported foods travel from far away and this can negatively impact the environment • I can bring a creative element to the food being designed • I can follow a recipe to make a food product. • I can weigh out food items. • I can work within a budget to plan a meal.	• I know what constitutes a balanced diet • I know the relevant ingredients and equipment needed for a recipe • I can describe how food ingredients come together. • I know how to explain to others how to be hygienic when preparing and handling food. • I know how to explain to other people how to stay safe whilst preparing food.	• I know what combinations of food that will complement one another • I know where food comes from, describing the process of 'Farm to Fork' for a given ingredient • I know how to adapt a recipe to make it healthier • I Know how to prepare food by collecting the ingredients in the first instance. • I can explain the difference between a sweet and a savoury snack.

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		I know how to stay safe whilst preparing food	I know which seasons different foods are ready for harvesting.	I know how food ingredients should be stored.	• I know how food ingredients should be stored and give an explanation as to why they should be stored this way.
Design	Not studied at KS1			• Drawing a series circuit diagram and symbols	
Make		• Making an electrical product with a working electrical circuit and switch		• Mapping out where different components of the circuit will go • Making and testing a circuit Incorporating a circuit into a base	
Evaluation		• Evaluating electrical products			
Knowledge		• I know how electrical items work and able to identify them. • I know what electrical conductors and insulators are • I know that a battery contains stored electricity and can be used to power products •I know that breaks in a circuit will stop it from working		• I know that copper is a conductor and can be used as part of a circuit •I know that batteries contain acid, which can be dangerous if they leak • I know the names and can identify the circuit components in a steady hand game • I know the key components used to create a functioning circuit	

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Year 3	Sticky Knowledge
Autumn	• I can identify different mechanisms such as flaps, sliders and levers in different contexts. • I can analyse a variety of products which have levers and linking mechanisms. • I can use experimenting to help me develop my ideas and create a final design. • I can explain what a prototype is and why they are useful. • I can explain my choices of materials. • I can communicate what my idea is and explain how it will work to another person. • I can order the steps I need to make my final product. • I can select and use appropriate tools with accuracy including cutting, shaping and joining. • I can demonstrate how to use finishing techniques to make my final product look exciting. • I can evaluate my product for its appearance, durability and whether it is easy to use.
Spring	• I can use different techniques to cut and join paper and card. • I can explain the properties of different 2D and 3D shapes. • I can investigate and evaluate a range of different shell products. • I can generate ideas to create a product that meets set criteria. • I can analyse existing products for their effectiveness. • I can create a design using annotated sketches on Microsoft Word to communicate my ideas. • I can order the steps to make my product. • I can use appropriate tools to measure, mark, cut, score and assemble my product. • I can use Microsoft Word to create finishing products for my design • I can test and evaluate my product based on the design criteria.
Summer	• I can explain what healthy and unhealthy is • I can prepare and safely process foods by cutting and preparing the area I am using • I know the bridge method to cut safely • I can design and make a healthy food. • I can evaluate the product that I made and make improvements upon how to improve.

Year 4	Sticky Knowledge
Autumn	• I know what is needed to make an electrical circuit • I know explain what a LED is • I know that a battery contains stored electricity and can be used to power products

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	• I know that breaks in a circuit will stop it from working • I can create a working LED circuit using pressure as a switch • I can thread needles independently • I can use a running stitch and a backstitch accurately • I can produce a product plan for a purpose. • I can persevere and adapt work when original ideas do not work. • I know which materials are likely to give the best outcome. • I can evaluate a product for both appearance and purpose.
Spring	• I can explain what a balanced diet is. • I can explain the difference between savoury and sweet. • I can research recipes and understand how to read if they are healthy or not. • I can suggest 'swaps' to make an unhealthy food healthier. • I can explain how chefs such as Jamie Oliver have campaigned to make food for children healthier. • I can plan my 'swaps' recipe. • I can prepare my recipe safely using the right equipment. • I can ask questions to evaluate the taste, appearance and texture of my food. • I can improve my recipe based on feedback. • I can read a food label and explain whether it is healthy choice or not.
Summer	• I can explain what a pneumatic system is and that it is part of a mechanism. • I can demonstrate how a pneumatic system forces air to create movement. • I can name different equipment used to make a pneumatic system. • I can communicate my design ideas using sketching and labelling. • I can design a product which will need to support weight. • I can create a product that meets a set design brief. • I can accurately measure my materials to minimise wastage. • I can evaluate and improve my design.

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Year 5	Sticky Knowledge
Autumn	• I can explain what a design brief is and create a plan that meets it. • I can give different examples of fastenings and explain which ones are the best for certain products. • I can create pattern pieces that can be used to create multiple identical products. • I can measure, mark and cut fabric accurately and in a way that minimises wastage. • I can use a range of stitches (running, backstitch and blanket) and select the right stitch for a purpose. • I can stitch pieces of material together ensuring there are no holes and that the stitches are strong enough to hold a product inside. • I can use applique to attach pieces of fabric for decoration. • I can add a fastening that works. • I can assess and evaluate my product for its functionality and marketability.
Spring	• I can explain what is meant by seasonality and give examples of different fruit and vegetables that are in season in the UK. • I can name some foods which are grown, reared, caught and processed in the UK. • I can give examples of dishes that can be cooked seasonally and use their recipes as inspiration. • I can generate a range of ideas for balanced seasonal soup recipes. • I can develop and refine a recipe. • I can chop and prepare different vegetables. • I can explain what is meant by seasoning food and have experimented with using different seasonings. • I can use mixers appropriately and safely. • I can safely use a hob and manage hot pans. • I can evaluate a range of products based on taste, appearance, texture and smell.
Summer	• I can explain what movement is and give examples of different movements. • I can explain that a mechanical system has an input, process and an output. • I can explain what a cam is. • I can give examples of different cams and the movements they make. • I can create a series of designs based on internet research. • I can create a design specification based on my thinking. • I can communicate my ideas using drawings from different angles. • I can select a range of appropriate tools for cutting and joining wood and cardboard. • I can use these tools safely. • I can use feedback from others to help suggest improvements to my work.

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Year 6	Sticky Knowledge
Autumn	• I know how to adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients • I can suggest recipe alterations for a purpose • I can demonstrate how to work safely and hygienically when handling food • I can follow a recipe, including using the correct quantities of each ingredient • I can evaluate different foods, considering: taste, smell, texture and origin of the food group • I can give examples of how to stop cross contamination • I can explain what different types of dietary needs there are
Spring	• I can analyse a product to work out how the different components work to make the product work. • I can name and explain how an electrical circuit works within a product. • I can explain how to ensure an electrical circuit is used safely in a product. • I can use an exploded diagram to explain how a product works. • I can explain which parts of a product affects its function. • I can explain who this product's target user might be. • I can assemble a product and decide how best to make it. • I can create instructions about how to make a product for someone else to follow. • I can alter the way a product functions by tinkering with its configuration.
Summer	• I can give examples of how different designers and brands have upcycled items of clothing. • I can create different designs that use the materials I have been given. • I can use exploded diagrams to show different levels of detail with my design. • I can select or reuse a fastening for a purpose. • I can create a paper prototype of my design to turn into pattern pieces. • I can accurately cut my pattern pieces. • I can use a range of appropriate stitches to hold my design together securely. • I can add decorative detail to make my product appealing. • I can evaluate my product for purpose and visual appeal.