WRENINGHAM VC PRIMARY - CURRICULUM KNOWLEDGE AND KEY SKILLS PROGRESSION



INTENT

The intent of our **Design Technology Curriculum** is to deliver a curriculum which inspires our children to be innovative, creative and flexible thinkers and designers. They will understand and appreciate the whole design cycle, through ideas and research, product creation, problem solving and evaluation.

We want to equip them with the skills and confidence to take a risk through redrafting ideas and designs, making modifications and improvements, and not being afraid to be constructively critical in their ongoing and final evaluations of both their own and their peer's work. They will learn and develop building and construction skills using a range of tools and materials appropriate for the task and purpose of the final product, and attain an understanding of how to make a good choice in relation to these two aspects of the design process.

We aim to build an awareness of the importance and impact of design in our everyday lives, embedding skills and understanding which will may enable and encourage our children to appreciate, reflect upon and possibly contribute to, areas of design in the future.

IMPLEMENTATION

We implement a progressive design technology curriculum that builds on prior knowledge, and design and technology geographical vocabulary and skills year on year. Children have access to key knowledge, language and meanings to understand Design Technology and to use these skills across the curriculum. In Design Technology children are asked to solve problems, and design their product to match a criteria and meet a purpose. Teachers talk collaboratively with children , using their sketch book designs, prototypes and final products to highlight, guide and encourage areas of development, insight and improvement during each project,

Design and technology lessons are taught :

- in selective terms throughout the school year as part of the ongoing weekly class teaching, with art and design being taught in the gap terms.
- through specific whole school focus curriculum days/week : e.g. design an egg carrying vehicle week

When designing and making, the children are introduced to projects involving the key areas of mechanisms, structures, fabrics, electrical systems (in KS2) and the digital world. Within these areas, the following design process of 'design', 'make', and 'evaluate' is followed:

1. Design:

• use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose

• generate, develop, model and communicate their ideas through discussion, annotated sketches, diagrams and prototypes,

2. Make:

• Continuous provision in Class 1 for children to choose to design, construct and experiment: Construction (e.g. lego, big bricks, polydron, Lasy)

Junk modelling- (to include junk, sticky tapes, scissors, joining materials etc.), Book-making- hole punching, connecting with string, wool, staples etc.

activities to promote cutting skills, Sculpting- sand, clay

• children are able to select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing, as well as chopping and slicing) accurately.

• children are able to select from and use a wide range of materials, ingredients and components, including construction materials, textiles and ingredients, according to their functional properties, aesthetic qualities and, where appropriate, taste.

3. Evaluate:

• encourage children to investigate, analyse and evaluate a range of existing products.

• ensure children evaluate their ideas and products against their own design criteria and understand that this process should be used to stimulate new ideas and improvement.

• teach and enable children to understand how key events and individuals in design and technology have helped shape the world.

• provide age/ability appropriate evaluation frames to facilitate effective, insightful evaluation (e.g. star rating, detailed written evaluation)

Technical knowledge:

• provide design projects which allow children to apply their understanding of how to strengthen, stiffen and reinforce more complex structures.

• provide opportunities to enable children understand and use mechanical systems in their products.

• provide design projects which incorporate electrical systems in the products in Key Stage 2.

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Design & Technology

- explore computing tasks where they can apply their understanding of computing to program, monitor and control their products
- provide cooking tasks which enable children to understand some of the ways that food can be processed and the effect of different cooking practices
- Key skills and key knowledge for D and T have been mapped across the school to ensure progression between year groups.
- Children learn about real life structures and the purpose of specific examples, as well as developing their skills throughout the programme of study.

IMPACT

Children will have clear enjoyment and confidence in design and technology that they will then apply to other areas of the curriculum.

The final products produced will encapsulate the design process embarked upon – displaying elements of the design phase and incorporating modifications, and improvements, and be accompanied by an insightful evaluation.

Children will build, year by year upon their design and technical skills, and the ability to make good choices and changes to their design.

Children will ultimately know more, remember more and understand more about Design Technology, demonstrating this knowledge when using tools or skills in other areas of the curriculum and in opportunities out of school.

The large majority of children will achieve age related expectations in Design Technology.

As designers children will develop skills and attributes they can use beyond school and into adulthood.

National Curriculum Statutory requirements Topics	ics
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 criteria -generate, develop, model and communicate their ideas through talking, drawing, templates, mock- ups and, where appropriate, information and communication technology Make -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics Evaluate -explore and evaluate a range of existing products -evaluate their ideas and products against design criteria Technical knowledge -build structures, exploring how they can be made stronger, stiffer and more stable -explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. 		When designing and making, pupils should be taught to: Design -design purposeful, functional, appealing products for themselves and other users based on design	1. 2.	Food Fruit salad Mechanical:
Cooking and Nutrition -use the basic principles of a healthy and varied diet to prepare dishes -understand where food comes from	Stage 1 - Year 1/	 -generate, develop, model and communicate their ideas through talking, drawing, templates, mockups and, where appropriate, information and communication technology Make -select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] -select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics Evaluate -explore and evaluate a range of existing products -evaluate their ideas and products against design criteria Technical knowledge -build structures, exploring how they can be made stronger, stiffer and more stable -explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. 	4 . 5.	Structures: Bridge for billy goat gruff Structures: Christmas Candle Holder Food: Wraps – balanced diet Textiles:

	Topics
 When designing and making, pupils should be taught to: 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 Make -select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], 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 Evaluate -investigate and analyse a range of existing products -investigate and analyse ar ange of existing products -understand how key events and individuals in design and technology have helped shape the world Technical knowledge -understand no use electrical systems in their products [for example, gears, pulley, cams, levers and inkages] -understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] -apply their understanding of computing to program, monitor and control their products. Cooking and Nutrition -understand and apply the principles of a healthy and varied diet -prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques -understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. 	 Food: Y5/6 Creating a seasonal food product along with appropriate packaging. Mechanical Systems: Y5/6 Designing and creating a mechanical automata toy Structures/Digital World: Y5/6 Designing a bridge for strength Food: Y5/6 Cooking a savoury/non-savoury, seasonal, healthy food Structural/Textiles/Electrical Systems: Y5/6 Designing an effective teaching model Food: Y5/6 Creating a healthy, effective sports snack using seasonal food. Textiles: Y5/6 Designing a costume accessory with fabric Mechanical/Electrical Systems: Y3/4 Create a Xmas Card Mechanical: Y3/4 Design and Build a Refugee Shelter (New DT project - result of DT co-ordinator course on further development of DT November 22 - March 22) Textiles: Y3/4 Design a WUII patchwork quilt – learning to sew Food/Structure: Y3/4 Bake a healthy biscuit under the sea

	Food	Mechanical:	Structures
	KQ: Which fruits would be good in your salad?	KQ: What parts of my picture should move?	KQ: How do bridges support weight?
	BI: That food is grown seasonally. Some foods are healthier	BI: That there are different ways to join and make pictures	BI: That bridges are constructed in a specific way to create strength
	than others.	move.	and support.
Year 1/2	Fruit Salad students design and make a bowl of fruit salad to share with the other children in the class. Students need to consider the look, feel and taste of the fruit salad so that it matches the requirements of the group, as revealed by their own research and recorded in their specification. This unit introduces the sensory evaluation of food and how to use everyday cutting tools in the production of a simple food product	Moving Pictures/Pop up books - super heroes flying through the sky. Look at/compare moving pictures and mechanisms. Learn how to make them- have a go at making a variety. Design own moving picture involving space/rockets. Describe their design by using pictures, diagrams, and words. Make- select appropriate materials and tools, experiment and use appropriate joins/mechanisms Evaluate- peer/partner feedback. Write an evaluation to include how to make it better next time.	Structures: Bridge for billy goat gruff Look at a variety of bridges. Look at structure. What does a bridge do? Properties of a good bridge. Introduce problem- need a new bridge. Design: Describe their design by using pictures, diagrams, and words. What materials- card, blocks, bricks Make- select appropriate materials and tools, experiment and use appropriate joins/mechanisms Evaluate- peer/partner feedback. Which group made the most successful bridge? How can we tell? What criteria are we judging it on? Write an evaluation to include how to make it better next time.

Structure:	Food:	Textiles:
KQ: How can I use a candle safely? Bl: The choice of material can affect how to use an object	KQ: What makes a balanced diet? BI: Healthy eating means eating a variety of foods from each of the food groups and some in moderation.	KQ: What can you learn from a textile tree? BI: Materials are all suited to different uses depending on their properties.
safely Christmas DT project- candle holder.	Make wraps Look at healthy/unhealthy foods Properties of a healthy salad.	In this unit students design and make a simple tree structure using a variety of textiles, paper and card. The unit allows students to handle and experience a variety of
Design- compare holders, look at structure, joins, aesthetic design.	Design – maths focus- sharing, counting, measure- money, weight, capacity etc.) Evaluate-	textiles and relate them to their everday uses. They make textile sample cards to hang on the tree so that it becomes a learning resource for the whole class.
Describe their design by using pictures, diagrams, and words. Make it: select appropriate materials and tools, experiment and use appropriate joins e.g. handles Make a structure/model using different materials Evaluate- discuss with peers, listen to and give feedback. How would we do it differently next time?	How much did it cost? Was it within budget? Who made the cheapest? How successful? Taste, presentation, etc. Improvements Technical – use of knives, peeler, scales	
Write about how we would do it differently next time		

	Cycle A	Cycle A	<u>Cycle</u>
	Big Idea: How a product is used will influence its	Big Idea: Form follows Function	Big Idea: Form follows Function
	design.	KQ: Why is packaging important?	KQ: How can a biscuit be savoury?
	KQ: How can I apply my scientific knowledge of		Food:
	circuits to design?	Packaging:	Create a Biscuit
	Mechanical/Electrical Systems: Create Xmas Card Plan, design, create and evaluate a Christmas card that will contain -a simple electrical circuit -a mechanical component	 -investigate a range of commercially made packaging and recognise that many examples are created from nets -make a paper model (mock-ups/prototype) of their ideas -then measure, mark out, cut and assembly with accuracy -evaluate their packaging against their original design criteria -produce packaging that is visually attractive, accurately made and appropriate for its purpose 	Design, bake and evaluate a healthy biscuit - investigate ingredients and health/nutrional value -develop a biscuit: shape, ingredients, aesthetics -bake two: one to eat and one to use to help in designing the packaging Structure:
	Vocabulary: plan, design, evaluate, mechanical	Vocabulary: design, evaluate, aesthetics, packaging, model, prototype, accurate	Vocabulary: design, evaluate, aesthetics, packaging, model, prototype, accurate
	Cycle B	Cycle B	Cycle B
Year 3/4	Big Idea: Moving pictures can be created with simple materials like paper and card. KQ: What is the difference between pop up and paper mechanisms? How can I include both in my design? Mechanical: Pop-up Books Design a 3-4 page pop-up book for Class 2 (y1/y2) based on Class 3's history topic (non-fiction) -learn about pop-up books and why they are so popular -discover how different card mechanisms create different sorts of movement -know how to accurately cut, score, fold and join to produce working, reliable card mechanism -to develop different graphic styles and match these to the	Big Idea: Materials, joins and their effectiveness for the design purpose varies from project to project. KQ: How can materials be joined or fitted together for a purpose? Textiles: Fabric Design - Sewing -WW2 Day: Make do and mend session; using a simple stitch, join together 2-4 pieces of material -take these skills to then design and make a sleeping bag for a teddy Structure: How Hill Residential -thatched roof building -aim: make your roof strong and waterproof	Big Idea: There is a need to be creative in thinking about novel ways to use materials. KQ: How can I maximise the use of a limited number of materials to make a structure warm, dry and safe? Structure: Designing and making a shelter for a purposes -identify and discuss the features of an Anderson Shelter -plan and design a structure to provide shelter and safety to refugees in harsh conditions around the world today. Set different criteria – e,g., heat/cold/risk of flood/earthquake -choose the most appropriate materials for their design -measure, cut and assemble their design with increasing accuracy throughout the building process - evaluate functionality
	needs of their chosen audience -to match card mechanisms to the movements they want to achieve in their book -pop up: pops out of the book using the energy drawn from pulling two pages apart -paper mechanism: slide, rotation or flap of paper Vocabulary: pop-up, mechanism, movement, accurate	Vocabulary: stitch, join, waterproof	Link to History – World War 2 Vocabulary: shelter, structure, criteria, appropriate, accuracy, evaluate, function

Food/Structure: Mechanical: Structure/Digital World:			
	Structure/Digital World:	Mechanical:	≻ e

Creating a Xmas product and packaging it to meet a criteria	Cams and machines and how they operate	Brunel Bridges Design
 Big Idea: Designing an effective product requires development and modification KQ: How can I meet a design criteria with the design choices I make? Traditional cooking – create Christmas peppermints; hygiene in the kitchen Designing a functional presentation box to hold the mints securely, re-sealable – reflecting a high quality product. On a shop shelf Explore the elements behind this (design, colour, lettering) Investigate packaging Evaluating the design in functional and aesthetic terms. Link to Computing/Literacy - Choosing fonts for purpose 	 Big Idea: Shape and position can affect how elements of a machine affect movement KQ: How can I affect a range of multiple movements with one initial movement on my machine? Cams and machines – design the movement of a mechanical automata time machine toy linked to reading of H.G Wells; incorporate an electronic element – lights/buzzers – operated through the movement of the mechanics Evaluating the design in functional and aesthetic terms. Link to Literacy – H.G. Wells 'The Time Machine' Link to Science – Changing Circuits 	 Big Idea: Good bridge design is related to a good understanding of how forces work KQ: What are the design features of a strong bridge? Designing a Bridge like Brunel: Using Brunel's designs as inspiration, design a functional bridge to span a given gap, fulfilling aesthetic and load bearing criteria. Using CAD to create design. Evaluating the design in functional and aesthetic terms. Link to History – Victorian Ideas topic Link to Science - Forces Textiles: Costume and Set Design for Class 4 Play – including weekend workshop session. Costume design – pattern cutting and sewing skills Design and make a costume accessory for a specific character
 Structure: Creating a Functional Product Big Idea: An effective design must be aesthetically pleasing and functional KQ: How do I evaluate the success of my design? Design two-tier 'cake' stand to serve a savoury and sweet dish for a Christmas afternoon tea given functional and aesthetic criteria. Food: Designing a savoury Xmas finger food, using seasonal, butritious vegetables Big Idea: Tasty food can be healthy and nutitipous KQ: Can food perceived as boring be made into a delicious snack? 	Structure/Textiles: An Effective Teaching Model Big Idea: Good design meets a purpose effectively KQ: How to I design a hands-on product which will be resilient? Design a geographical teaching model to represent the Mount St. Helens eruption before and after, along with the workings of the internal volcano which can be used as a tactile teaching aid using a variety of materials. Design element this term, followed by construction in summer 1 Link to Geography – Volcanoes Link to Science – Changing Circuits	Structure/Textiles: An Effective Teaching Model Big Idea: Good design meets a purpose effectively COnstruction element from previous term Food: Designing a light, healthy, energy giving snack for a summer sports event, using seasonal vegetables. Big Idea: Certain food provide energy while still being considered healthy. KQ: Can a snack be tasty, and healthy and practical to eat during an event? Textiles: Costume and Set Design for Class 4 Play – including weekend workshop session. Costume design – pattern cutting and sewing skills Design and make a costume accessory for a specific character

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	Year 1/2	Year 3/4	Year 5/6
	Can pupils	Can pupils	Can pupils
eas	Year 1	Year 3	<u>Year 5</u>
j	-Identify the key features of an existing	-Plan their design, using accurate diagrams and labels	-Take a user's view into account when designing
ing	product	-Plan the equipment/ tools needed and give reasons why	-Produce a detailed step-by-step plan for their design
cat	-Think of some ideas of their own	-Start to order the main stages of making their product	method
ni	-Plan an outcome through pictures with	-Identify a design criteria and establish a purpose/	-Suggest some alternative designs and compare the
E E	labels	audience for their product	benefits and drawbacks to inform the design process and
esigning ng and com	-Explain their ideas orally	How realistic are the plans? E.g. tools, equipment,	outcome
and o		materials, components?	
Sig ar	Year 2		Year 6
Dee	-Generate ideas through comparing existing	Year 4	-Use a range of information to inform their design
	products	-Create a final design for their product based on initial	-Use research to inform plans
d	-Plan an innovative product	ideas and revisions, based on existingideas	-Work within constraints
υĝ	-Choose the most appropriate tools and	-Create a detailed plan considering their target audience,	- Justify their plan to some one else
iqo	materials and explain their choices	design criteria and intended purpose	-Consider culture and society in their designs
vel	-Describe their design by using pictures,		-Consider the use of the product when selecting materials
De	diagrams, and words?		-Think about how their product could be marketed through
			packaging and advertising

		Key Knowledge & Skills	
	Year 1/2	Year 3/4	Year 5/6
Making Working with tools, equipment, materials and components to make quality products	Year 1 -Explain what they are making -Select appropriate resources and tools -Explain which tools they are using and why -Use tools safely Year 2 -Join materials/ components together in different ways -Measure materials to use in a model or structure -Use joining, folding or rolling to make it stronger	Year 3 -Use equipment and tools accurately and safely -Select the most appropriate materials, tools and techniques to use -Manipulate materials using a range of tools and equipment -Measure, cut and assemble with increasing accuracy Year 4 -Use equipment and tools with increased accuracy and safety -Select the most effective materials, tools and techniques to use -Manipulate materials effectively using a range of tools and equipment -Manipulate materials effectively using a range of tools and techniques to use -Manipulate materials effectively using a range of tools and equipment -Measure, cut and assemble accurately	Year 5 -Choose appropriate tools and materials to ensure the final product will appeal to the audience -Use a range of tools and equipment with good accuracy and effectiveness, within established safety parameters Year 6 -Choose appropriate tools and materials to ensure that the final product will appeal to the audience -Use a range of tools and equipment with good accuracy and effectiveness, within established safety parameters

	Year 1/2	Year 3/4	Year 5/6
ating sses and products	Year 1 - Describe how their product works -Identify success and next steps <u>Year 2</u> -Assess how well their product works -Explain what they would improve if they did	Year 3 -Start to think about their ideas as they make progress and be willing to make changes if this helps them to improve their work -Assess how well their product works in relation to the purpose -Explain how they could change their design to make it better	Year 5 -Continuously check their design is effective and fit for purpose -Assess how well their product works in relation to the design criteria and the intended purpose and suggest improvements -Evaluate appearance and function against the original design criteria
Evaluating processes a	it again	Year 4 -Think about their ideas as they progress and make changes to improve their work -Assess how well their product works in relation to the design criteria and the intended purpose -Explain how they could improve their design and how their improvement would affect the original outcome	Year 6 -Test and evaluate their final product (Is it fit for purpose? What would improve it? Would different resources have improved their product?) -Does their product meet all design criteria?

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Year 1/2 Year 3/4 Year 5/6	
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Year 1Year 3Year 5-Make a product which moves-Join textiles of different types in a range of ways-Make up a prototype first-Cut materials using scissors-Begin to use a range of simple stitches-Use a range of joining techniques-Describe the materials using differente.g. running stitch, with more independence-Devise a template or pattern for thei	
-Cut materials using scissors-Begin to use a range of simple stitches-Use a range of joining techniques-Describe the materials using differente.g. running stitch, with more independence-Devise a template or pattern for thei	
-Describe the materials using different e.g. running stitch, with more independence -Devise a template or pattern for thei	
words - learn additional blanket stich technic	que
-Say why they have chosen moving parts -make a product which uses mechanical components -Refine their product after testing it	
-Arrange pieces of the construction -join materials effectively to build a product -Measure accurately enough to ensur	-
before building -Use a range of techniques to shape and mould -Demonstrate their product is strong	
-Make a structure/model using different materials Refine and further improve their pro-	duct
materials	
Year 4 Year 6	
Year 2 -Consider which materials are fit for purpose and join -Use different electronic circuits in the	
-Join textiles together to make a product, them appropriately - pin and tack fabrics prior to sewing a	accurately and
using techniques such as stitching independently	
-Cut textiles accurately -Use a simple circuit and add components to it -Incorporate a switch into their produ	ict
-Explain why they chose a certain textile -Make a product which uses both electrical and -Refine their product after testing it-	
mechanical components - Experiment with different cams for o	different mechanical
-Join materials together as part of a effects	
moving product -Measure accurately to build effective structures	
-Explain how different parts move -Demonstrate their product is strong	
-Refine and further improve their pro-	duct
-Make sensible choices of which material Cooking & Nutrition:	
to use for their construction <u>Year 3:</u> Cooking & Nutrition:	
-Make their structure stronger, stiffer or begin to understand seasonanty, prepare and cook	
more stable mainly savoury dishes Cook savoury dishes for a healthy, var	ried diet, making justified
choices relating to healthy food	
Cooking & Nutrition:	
Year 1/2: Cooking Skills: Age 9 to 11 – adapted	from British Nutrition
Use the basic principles of a healthy and savoury dishes Foundation	
varied diet/understand where food	skills with confidence
comes from	
Nutrition Foundation	
Cooking Skills: Age 5 to 7 – adapted from	carrots, courgettes)
British Nutrition Foundation	
L can name and use a range of basic	ereg flourintoa
cooking skills with support.	
E.g. • Mix (thoroughly)	ligital scales, analogue
Peel (with a peeler) Peel (with a peeler)	ingital scales, analogue
Mix (with increasing Wiedsure (with measuring jug, scales)	and skill e g zest from a
thoroughness)	una skiii, e.g. 20st 110111 d
Spread (soft ingredients) Control	ebah sticks e g onions)
Grate (firmer foods like carrots)	

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	Design & Technology	
 Measure (with measuring spoons, scales) Snip with kitchen scissors Grate (soft foods like cheese) Shape Crush (soft fruit with a potato masher) Cut out with cutters Spoon ingredients (in to different containers) Arrange Thread (soft foods onto a cocktail stick, e.g. strawberries, satsuma segments) Sift (flour into a bowl) Cut (soft foods* with a table knife progressing to firmer foods with a vegetable knife) using: Fork secure Claw grip Bridge hold *canned peaches, fresh strawberries, banana, sticks of pepper 	 Shape (with greater precision) Cut out with cutters (positioning carefully to avoiding wasting ingredients) Spoon ingredients (using two spoons) Arrange (in an attractive way) Cut (soft foods with table knife progressing to firmer foods** with a vegetable knife) using: Fork secure Claw grip Bridge hold **tomatoes, celery, apple 	 Cut (firm*** and other foods with a vegetable knife) using: Fork secure Claw grip Bridge hold *** potatoes, carrots