

## Design and Technology

'Good buildings come from good people, and all problems are solved by good design'      Stephen Gardiner



### Curriculum Intent

Design and Technology is an inspiring, rigorous and practical subject. Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team. At Madron Daniel CE Primary School, we encourage children to use their creativity and imagination, to ask questions about design (enquire) and make products that **solve real** and **relevant problems** within a variety of contexts, considering their own and others' needs, wants and values. We aim to, wherever possible, link work to other disciplines such as mathematics, science, engineering, computing and art. Where relevant we will also refer to designers working in Cornwall, both past and present, for examples of design technology in practice. We build up subject specific vocabulary in each unit of work and build in outcomes for the children to share their knowledge so they can use their newly acquired vocabulary. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers. ,

### Design Technology

By the end of Key Stage One our Younger Designers should through a variety of creative and practical activities:

- Have the knowledge, understanding and skills needed to engage in an iterative process of designing and making.
- Be able to work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

By the end of Key Stage Two our Younger Designers should:

- Have knowledge, understanding and skills needed to engage in an iterative process of designing and making.
- Be able to work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

As part of their work with food, should be taught how to cook .They should be able to:

- apply the principles of nutrition and healthy eating.

Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life

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## Overview

KS1	EYFS - *Speaking *Physical Development *Understanding the World * Expressive Arts and Design.			
	<b>Textiles</b> Templates and joining techniques	<b>Mechanisms Sprng lever)</b> Sliders and levers Wheels and Axes	<b>Structures</b> Freestanding structures	<b>Food</b> Preparing fruit and vegetables (including cooking and nutrition requirements for KS1)

KS2 A	<b>Structures</b> Shell structures (including computer-aided design) Frame structures	<b>Electrical Systems</b> Somple Cirucuits (including programme and control) More complex switches and circuits (including programming, monitoring and control)	<b>Textiles</b> 2-D shape to 3-D product
	<b>Mechanical Systems</b> Levers and linkage Pulleys and Levers	<b>Food</b> Healthy and varied diet (including cooking and nutrition requirements for KS2) Celebrating culture and seasonality (including cooking and nutrition requirements for KS2)	<b>Textiles</b> Combining different fabric shapes (including computer-aided design)

# Design and Technology

		Design	Make	Evaluate	Technical knowledge and Understanding
E Y F S	<b>Structures</b>	Experience of using construction kits to build walls, towers and frameworks. • Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card. • Experience of different methods of joining card and paper.			
	<b>Mechanisms</b>	vehicles through play. • Gained some experience of designing, making and evaluating products for a specified user and purpose. • Developed some cutting, joining and finishing skills with card.			
	<b>Textiles</b>	Explored and used different fabrics. • Cut and joined fabrics with simple techniques. • Thought about the user and purpose of products			
	<b>Food tech</b>	Experience of common fruit and vegetables, undertaking sensory activities i.e. appearance taste and smell. • Experience of cutting soft fruit and vegetables using appropriate utensils.			
K e y S t a g e 1	<b>Structures</b>	Generate ideas based on simple design criteria and their own experiences, explaining what they could make. Develop, model and communicate their ideas through talking, mock-ups and drawings.	Plan by suggesting what to do next. Select and use tools, skills and techniques, explaining their choices. Select new and reclaimed materials and construction kits to build their structures. Use simple finishing techniques suitable for the structure they are creating	Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.	Know how to make freestanding structures stronger, stiffer and more stable. Know and use technical vocabulary relevant to the project.
	<b>Mechanisms</b>	Generate initial ideas and simple design criteria through talking and using own experiences. Develop and communicate ideas through drawings and mock-ups.	Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.	Explore and evaluate a range of products with wheels and axles. Evaluate their ideas throughout and their products against original criteria.	Explore and use wheels, axles and axle holders. Distinguish between fixed and freely moving axles. Know and use technical vocabulary relevant to the project.
	<b>Textiles</b>	Design a functional and appealing product for a chosen user and purpose based on simple design criteria. Generate, develop, model and communicate their ideas as appropriate through talking, drawing, templates, mock-ups and information and communication technology.	Select from and use a range of tools and equipment to perform practical tasks such as marking out, cutting, joining and finishing. Select from and use textiles according to their characteristics.	Explore and evaluate a range of existing textile products relevant to the project being undertaken. Evaluate their ideas throughout and their final products against original design criteria.	Understand how simple 3-D textile products are made, using a template to create two identical shapes. Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling. Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons. Know and use technical vocabulary relevant to the project.
	<b>Food tech</b>	Design appealing products for a particular user based on simple design criteria. Generate initial ideas and design criteria through investigating a variety of fruit and vegetables. Communicate these ideas through talk and drawings.	Use simple utensils and equipment to e.g. peel, cut, slice, squeeze, grate and chop safely. Select from a range of fruit and vegetables according to their characteristics e.g. colour, texture and taste to create a chosen product.	Taste and evaluate a range of fruit and vegetables to determine the intended user's preferences. Evaluate ideas and finished products against design criteria, including intended user and purpose.	Understand where a range of fruit and vegetables come from e.g. farmed or grown at home. Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of The Eatwell plate. Know and use technical and sensory vocabulary relevant to the project.

# Design and Technology

		Design	Make	Evaluate	Technical knowledge and understanding
KEY STAGE 2	Textiles	<p>Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.</p> <p>Generate innovative ideas by carrying out research including surveys, interviews and questionnaires.</p> <p>Produce annotated sketches, prototypes, final product sketches and pattern pieces.</p> <p>Develop, model and communicate ideas through talking, drawing, templates, mock-ups and prototypes and, where appropriate, computeraided design.</p> <p>Design purposeful, functional, appealing products for the intended user that are fit for purpose based on a simple design specification</p>	<p>Plan the main stages of making.</p> <p>Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.</p> <p>Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.</p> <p>Produce detailed lists of equipment and fabrics relevant to their tasks.</p> <p>Formulate step-by-step plans and, if appropriate, allocate tasks within a team.</p> <p>Select from and use a range of tools and equipment to make products that are accurately assembled and well finished.</p> <p>Work within the constraints of time, resources and cost.</p>	<p>Investigate a range of 3-D textile products relevant to the project.</p> <p>Test their product against the original design criteria and with the intended user.</p> <p>Take into account others' views.</p> <p>Understand how a key event/individual has influenced the development of the chosen product and/or fabric.</p> <p>Investigate and analyse textile products linked to their final product.</p> <p>Compare the final product to the original design specification.</p> <p>Test products with intended user and critically evaluate the quality of the design, manufacture, functionality, and fitness for purpose.</p> <p>Consider the views of others to improve their work</p>	<p>Know how to strengthen, stiffen and reinforce existing fabrics.</p> <p>Understand how to securely join two pieces of fabric together. • Understand the need for patterns and seam allowances.</p> <p>Know and use technical vocabulary relevant to the project.</p> <p>A 3-D textile product can be made from a combination of accurately made pattern pieces, fabric shapes and different fabrics.</p> <p>Fabrics can be strengthened, stiffened and reinforced where appropriate.</p>
	Mechanical Mechanisms	<p>Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas.</p> <p>Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.</p>	<p>Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. • Select from and use finishing techniques suitable for the product they are creating.</p> <p>Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.</p>	<p>Investigate and analyse books and, where available, other products with lever and linkage mechanisms.</p> <p>Evaluate their own products and ideas against criteria and user needs, as they design and make.</p> <p>Compare the final product to the original design specification.</p> <p>Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.</p> <p>Consider the views of others to improve their work.</p> <p>Investigate famous manufacturing and engineering companies relevant to the project.</p>	<p>Understand and use lever and linkage mechanisms.</p> <p>Distinguish between fixed and loose pivots.</p> <p>Know and use technical vocabulary relevant to the project.</p> <p>Understand that mechanical and electrical systems have an input, process and an output.</p> <p>Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.</p> <p>Know and use technical vocabulary relevant to the project.</p>
	Food tech	<p>Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma for an appealing product for a particular user and purpose.</p> <p>Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.</p> <p>Generate innovative ideas through research and discussion with peers and adults to develop a design brief and criteria for a design specification. Explore a range of initial ideas and make design decisions to develop a final product linked to user and purpose. Use words, annotated sketches and information and communication technology as appropriate to develop and communicate ideas.</p>	<p>Plan the main stages of a recipe, listing ingredients, utensils and equipment.</p> <p>Select and use appropriate utensils and equipment to prepare and combine ingredients.</p> <p>Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.</p> <p>Write a step-by-step recipe, including a list of ingredients, equipment and utensils Select and use appropriate utensils and equipment accurately to measure and combine appropriate ingredients.</p> <p>Make, decorate and present the food product appropriately for the intended user and purpose.</p>	<p>Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.</p> <p>Evaluate the ongoing work and the final product with reference to the design criteria and the views of others.</p> <p>Carry out sensory evaluations of a range of relevant products and ingredients.</p> <p>Record the evaluations using e.g. tables/graphs/charts such as star diagrams.</p> <p>Evaluate the final product with reference back to the design brief and design specification, taking into account the views of others when identifying improvements. Understand how key chefs have influenced eating habits to promote varied and healthy diets.</p>	<p>Know how to use appropriate equipment and utensils to prepare and combine food.</p> <p>Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.</p> <p>Know and use relevant technical and sensory vocabulary appropriately.</p> <p>Know how to use utensils and equipment including heat sources to prepare and cook food.</p> <p>Understand about seasonality in relation to food products and the source of different food products.</p> <p>Know and use relevant technical and sensory vocabulary</p>

## Design and Technology

Key Stage 2	Design	Make	Evaluate	Technical Knowledge
<b>Electrical systems To be covered in science</b>	Use research to develop a design specification for a functional product that responds automatically to changes in the environment. Take account of constraints including time, resources and cost. Generate and develop innovative ideas and share and clarify these through discussion. Communicate ideas through annotated sketches, pictorial representations of electrical circuits or circuit diagrams.	Formulate a step-by-step plan to guide making, listing tools, equipment, materials and components. Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product. Create and modify a computer control program to enable an electrical product to work automatically in response to changes in the environment.	Continually evaluate and modify the working features of the product to match the initial design specification. Test the system to demonstrate its effectiveness for the intended user and purpose. Investigate famous inventors who developed ground-breaking electrical systems and components.	Understand and use electrical systems in their products. Apply their understanding of computing to program, monitor and control their products. Know and use technical vocabulary relevant to the project.