

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Key Stage 1

When designing and making, pupils should be taught to:

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

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.

Cooking and Nutrition

- Use the basic principles of a healthy and varied diet to prepare dishes
- Understand where food comes from.

Key Stage 2

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
- 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

Technical knowledge

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- 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.

St James' CofE Juniors – Design and Technology

	Year 3 Designer	Year 4 Designer	Year 5 Designer	Year 6 Designer
Progression and Assessment Criteria	Design - Create a design that meets a range of requirements. - Consider the equipment and tools needed when planning. - Describe a design using an accurately labelled diagram, and in words. - Choose a material for both its suitability and its appearance. Make - Follow a step-by-step plan, choosing the right equipment and materials - Use a range of tools and equipment with accuracy. - With some support measure, mark out, join, assemble materials and components with increasing accuracy. Evaluate Existing and Own Products - Identify how I could improve my product.	Design - Create a design to a simple success criteria. - Generate more than one idea for how to create a product. - Gather information to help design a successful product (i.e. by asking others' views and exploring similar products). - Produce a plan and explain it. - Suggest improvements to develop and refine a planned idea. Make - Use a range of tools and equipment with increasing accuracy. - Independently measure, mark out, join, assemble materials and components with increasing accuracy. - Persevere and adapt my work when my original ideas do not work. Evaluate - Evaluate and suggest simple improvements for my designs. - Evaluate products for both their purpose and appearance. - Explain how I have improved my original design.	Design - Come up with a range of ideas after collecting information from different sources. - Produce a detailed, step-by-step plan which could include: step by step instructions, cross sectional diagram, prototypes. - Suggest alternative plans; outlining the positive features and draw backs. - Explain how a product will appeal to a specific audience and criteria. Make - Use a range of tools and equipment competently. - Make a prototype before making a final version Evaluate - Evaluate appearance and function against original criteria. - Suggest improvements that could be made, considering material and methods.	Design - Use market research to inform my plans and ideas and create a success criteria - Follow and refine my plans. - Justify my plans in a convincing way - Produce an increasingly detailed, step-by-step plan which could include: step by step instructions, cross sectional diagram, prototypes. - Show that I consider culture and society in my plans and designs. Make - Work within a budget.) - Use a range of tools and equipment precisely and with increasing independence. - Consider the aesthetic qualities and functionality of my product whilst making it, refining details as necessary. Evaluate - Show that I can test and evaluate my products. - Evaluate my product against clear criteria. - Suggest improvements that could be made, considering material, methods, sustainability of the product and how much a product costs to make.

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Cooking	Cooking	<u>Prepare a Healthy Sandwich with a side of fruit or vegetables</u> - Know what makes a healthy and balanced diet. - Describe how food ingredients come together. - Know where food ingredients come from - independently-begin to peel food. - With ,moderate supervision begin to use claw grip with serrated vegetable knife to cut harder foods eg: carrot - Cut foods into evenly sized strips or cubes (peppers, cheese) - Assemble and arrange food to look appetising	<u>Prepare a simple hot dish on toast: beans on toast, toasted cheese sandwich, egg on toast</u> - Know the importance of and how to make healthy food choices. - Know how to be both hygienic and safe when using and preparing food. - Know how to store food safely. - Use claw grip with serrated vegetable knife to cut harder foods e.g carrot - Use both claw and bridge grip to cut the same food using a serrated vegetable knife - Cut foods into evenly sized strips or cubes (peppers, cheese - Grate harder food using a grater - Under supervision use a toaster and microwave - Assemble and arrange ingredients for simple dishes - Begin to cook foods (using toasters and microwaves with supervision).	<u>Make a preserve-pickle 2024: chutney, make the pickling vinegar using the class hob.</u> - Know the different nutrients that are important to health and which foods contain these. - Show that I can be both hygienic and safe in the kitchen. - Know where different foods come from and how they may be changed to help preserve or make them safer or tastier. - Understand seasonality and know how a variety of ingredients are grown, reared, caught and processed to make them safe and palatable/tasty to eat. - With support finely grate hard foods(zesting, parmesan) - With support use a can opener,ring pull - Dice foods and cut them into evenly sized fine pieces(with moderate support) - cConfidently use the claw grip to cut harder foods using a serrated vegetable knife - Peel harder food using a peeler (apple,potato) - Confidently use a microwave/ hob - With supervision use a food processor or electric blender to mash,blend puree hard ingredients.	<u>Prepare a healthy menu and make one of the dishes. Using oven/hob/slow cooker for filling.</u> - Use food labels to help choose the most healthy or appropriate ingredients and foods. - Use my understanding of healthy eating, hygiene and food safety to make my own menu. - Understand some of the ethical issues and social influences on the foods we choose to eat. - Embed the knowledge of portion sizes - Know importance of not skipping meals - Use market research to select dishes for menu - Begin to use a can opener - Finely grate hard foods(zesting,parmesan) - Confidently both claw and bridge grip to cut the same food using a serrated vegetable knife - Confidently peel - Confidently use a microwave - With supervision use a food processor or electric blender to mash,blend puree hard ingredients. - Join and combine ingredients appropriately. - Use hobs/oven to heat food, developing independence with this as appropriate.
		<u>Create an earthquake proof tower</u> - Identify features of a structure e.g. an earthquake proof tower. - Identify suitable materials to be selected and used for a structure, considering weight, compression, tension. - Extend the knowledge of wide and flat based objects being more stable. - Identify triangles as strong shapes - Know how to strengthen, stiffen and reinforce structures.	<u>Create a Roman Shield</u> - Know how to strengthen corners - Use layering to stiffen and reinforce materials and designs - Learn to create different textural effects with materials - Design a strengthened structure, linked to the learning project or scheme unit, that is aesthetically pleasing, and select materials to create a desired effect. - Begin to measure and cut materials with moderate support	<u>Create a wooden frame for space buggy</u> - Create a wooden frame structure to support electrical components. - Understand the terms: compression and tension. - Independently measure and mark wood accurately. - Select appropriate tools and equipment for particular tasks. - Use the correct techniques to saw safely. - Identify where a structure needs reinforcement and use card corners for support.	<u>Create a periscope</u> - Understand that 3D structures can be created from nets - Measure accurately to create own net to make a 3D structure. - Know that structures can be strengthened by manipulating materials and shapes. - Identify the shell structure in everyday life in cars, aeroplanes, tins and cans. - Build a range of structures drawing upon new and prior knowledge of structures. - Measure, mark and cut accurately to create a range of structures. - Use a range of materials to reinforce and add decoration to structures.

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Mechanical and Electrical Aspects	<u>Create Moving Robot Arm</u>	<u>Create simple lever switch to sound buzzer for simple circuit</u>	<u>Create a moving space buggy</u>	<u>Lego CAD - Creating Moving Models</u>
	- Understand how levers and linkages create movement - Create a simple lever system to make a desired motion. - Use simple lever system to create a simple moving picture of a robot. - Select materials due to their functional and aesthetic characteristics.	- Follow a design brief to make a lever switch, neatly and with a focus on accuracy. - Make mechanisms and/or structures using sliders, pivots and folds to produce movement to connect a simple circuit and sound a buzzer. - Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.	- Make a product using both electrical and mechanical components. - Use a motor to turn an axis and create movement. - Describe mechanisms that can be used to change one kind of motion into another. - Use a hand drill safely to drill holes accurately in the project piece <u>Lego CAD – Create Moving Fairground Ride</u> - With support make a product using computer programming, monitoring and control to create movement.	- Use simple gears to create movement in different directions. - With increasing independence use a computer to programme, monitor and control movement.
Textiles	<u>Prayer cushion quadrant 1</u>	<u>Prayer cushion quadrant 2</u>	<u>Prayer cushion quadrant 3</u>	<u>Prayer cushion quadrant 4 and joining</u>
	Create a simple pattern/ shape using running stitch	Decorate fabric by sewing on a simple applique	Add fastening and decorations to fabric including button, beads and sequins.	- Use all previous skills to create own design. - Pin and sew fabric together to make a joined edge.