Design and Technology Curriculum

Intent

At St. Mary's Junior School, our Design and Technology Curriculum has been organised to provide pupils with practical and skill-inspired experiences which encourage them to become curious and resilient, as well as creative. Children can eagerly apply their knowledge to a range of real-life problems and scenarios. We aim to provide pupils with experiences that will allow them to gain invaluable knowledge and skills essential for active participation in modern British life. The National Curriculum states that 'using creativity and imagination, pupils should design and make products that solve real and relevant problems within a variety of contexts.' When planning, cross-curricular opportunities are also identified, mapped and planned to ensure contextual relevance and progression. Children are encouraged to explore and celebrate their wider world through researching the experiences of others. A love of DT is nurtured through a whole school ethos and a varied and balanced DT curriculum, leading to every child viewing themselves as a successful 'designer' and harbouring an excitement to learn and explore.

Implementation

Our Design Technology curriculum covers the main strands outlined in the Key Stage 2 Primary Framework: designing; making; evaluating; technical knowledge; cooking and nutrition. The objectives listed are further sub-divided between upper key stage two and lower key stage two. At St. Marys Junior School, we plan and sequence the Design Technology curriculum so that the skills and knowledge can be covered in cross-curricular projects. Through doing so, we hope to enable pupils to fluently recall key technological and scientific facts and to make meaningful links in their learning. The Design Technology-specific vocabulary is overtly modelled and reinforced by staff, with discussion-based tasks integrated into each lesson to allow pupils to apply this vocabulary competently themselves. Pupils are given the opportunity to research and evaluate existing products relevant to their own project, analysing successful components that they may want to include in their own product, whilst exploring how they will creatively integrate their own ideas. Through this thoughtful and careful evaluation, pupils will be able to create their own new and exciting products. They will carefully select their own materials and tools, considering which ones would be appropriate for the design criteria and which ones will help them create a successful finish to their product. Good health and safety routines are modelled and reinforced throughout each project.

Teachers create purposeful and meaningful learning opportunities within their classrooms which promote a love for learning. Our whole school approach to the teaching and learning of design and technology involves the following:

- Design and Technology is taught in topic throughout the year, so that children can achieve depth in learning. Key knowledge and skills of each blocked topic are mapped across the school, ensuring that knowledge builds progressively and that children develop skills systematically.
- Cross curricular outcomes in Design and Technology are specifically planned for.
- As children move through the school, they acquire a progressive development of design concepts, knowledge and skills.
- At the end of each topic, classes produce a collaborative 'Show What We Know' display or presentation. Parents and carers are invited to view this (either by coming into school or through our Virtual Gallery on the website).

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Impact

Design and Technology assessment is ongoing throughout the relevant cross-curricular units to inform teachers with their planning lesson activities and differentiation. Summative assessment is completed at the end of each unit (objective tracker) to inform leaders of the improvements or skills that need to be further enhanced. Pupils are assessed against the key stage specific objectives set out in the progression framework. A significant part of assessment in Design and Technology will also be through a joint discussion between the teacher and individual pupils as each project progresses, allowing pupils to self evaluate their own designs and products and enabling them to use subject-specific vocabulary confidently. Pupil voice also takes place after a specific project has been completed, typically on a termly basis. This enables leaders to assess the impact of the Design Technology curriculum and it acts as a tool to assess the depth of pupil understanding and knowledge. Book monitoring throughout all year groups also takes place once a term to compliment this.

The successful, cross-curricular approach we take at St Mary's promotes a broad and balanced DT curriculum. Children have the opportunity to acquire key Design and Technology knowledge relating to the national curriculum strands. Key DT skills are supported through purposeful and engaging activities. Our engagement with the local area also ensures that children learn through varied and first hand experiences both in and out of the classroom.

'Show What We Know' –
Children demonstrate their learning as 'experts' Children also learn about careers related to DT from members of the local and wider community, helping prepare them for the next steps in their education. Our topics allow them to see all of the world as accessible and exciting. This engagement and appreciation of links to careers helps our pupils to personally raise their aspirations as a result of their sound DT knowledge and understanding.

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Design and Technology Curriculum Progression: 'We are a Thankful Community'

Autumn Term

KS1	Year 3	Year 4	Year 5	Year 6	KS3

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Design:	Design:	Design:

Column 1 — 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

Column 2 — 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]

Column 3 — Design:

♣ use research and exploration, such as the study of different cultures, to identify and understand user needs

♣ identify and solve their own design problems and understand how to reformulate problems given to them

♣ develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations

♣ use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses

♣ develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools

Make:

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| 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. | § apply their understanding of computing to program, monitor and control their products. | § select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture

♣ select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties

Evaluate:

♣ analyse the work of past and present professionals and others to develop and broaden their understanding

♣ investigate new and emerging technologies

♣ test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups

♣ understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, |
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		engineers and technologists
		Technical knowledge:
		♣ understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
		♣ understand how more advanced mechanical systems used in their products enable changes in movement and force
		♣ understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]
		♣ apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].

KS1	Year 3	Year 4	Year 5	Year 6	KS3

Cookery and Nutrition:	Cookery and Nutrition:	Cookery and Nutrition:
♣ use the basic principles of a healthy and varied diet to prepare dishes ♣ understand where food comes from.	♣ 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.	♣ understand and apply the principles of nutrition and health ♣ 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.

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