Design and Technology at St Johns

Intent

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve **real and relevant problems** within a variety of contexts, considering their own and others’ **needs, wants and values**. They acquire a broad range of **subject knowledge** and draw on disciplines such as **mathematics, science, engineering, computing and art.** Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of **past and present design and technology**, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well being of the nation.

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.

EYFS

During the Early Years Foundation Stage, the essential building blocks of children’s design and technology capability are established. There are many opportunities for carrying out D&T-related activities in all areas of learning in the EYFS. Specifically, ‘Designing and Making’ is identified as a strand within Knowledge and Understanding of the World.

By the end of the EYFS, most children should be able to:

•Construct with a purpose in mind, using a variety of resources

•Use simple tools and techniques competently and appropriately •Build and construct with a wide range of objects, selecting appropriate resources and adapting their work when necessary

•Select the tools and techniques they need to shape, assemble and join materials they are using.

Key stage 1

Subject content Key Stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment]. 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

Subject content Key Stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment]. 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 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

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

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• apply their understanding of computing to program, monitor and control their products.

Cooking and nutrition

* understand 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 how a variety of ingredients are grown, reared caught and processed

Year 1

|  |  |
| --- | --- |
| Exploring context and existing products | * Understand what a product is and who it is for * Understand how a product works and how it is used * Identify where you might find a product |
| design | * Explain what they are designing and making * Explain who their product will be used for * Describe what their product will be used for |
| planning | * Discuss what their steps for making could be * Represent their ideas through drawing and talking |
| making | * Choose suitable tools for making * Follow safety and food hygiene procedures * Measure, mark and cut shape materials and components * Join, assemble and combine materials and components |
| Evaluating | * Talk about their design ideas and what they have made * Make simple judgements of how the product met their design ideas |

Year 2/3- Class 2

|  |  |
| --- | --- |
| Exploring context and existing products | * Understand what a product is and who it is for * Understand how a product works and how it is used * Identify where you might find a product * Identify the materials used to make the product * Express an opinion about the product |
| design | * Explain what they are designing and making * **Use own experiences and existing products to develop ideas** * Explain who their product will be used for * Describe what their product will be used for and how it will work * **Explain why their product is suitable for the intended user** |
| planning | * Discuss what their steps for making could be * Represent their ideas through drawing and talking and computing **(where appropriate)** * **Choose materials to use based on suitability of their properties** * **Create templates/pattern pieces and explore materials whilst developing ideas** |
| making | * Choose suitable tools for making * Follow safety and food hygiene procedures * Measure, mark and cut shape materials and components * Join, assemble and combine materials and components * **Use finishing techniques including skills learnt in Art.** |
| Evaluating | * Talk about their design ideas and what they have made * Make simple judgements of how the product met their design ideas * **Suggest how their product could be improved**. |

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| Technical knowledge and making products work | KS1 pupils should know:   * About the simple working characteristics of materials and components * About the movement of simple mechanisms eg. levers,sliders, wheels and axels * How freestanding structures can be made stronger, stiffer and more stable * That a 3D textiles product can be assembled from two identical fabric shapes * That food ingredients should be combined according to their sensory characteristics * The correct technical vocabulary for the projects they are undertaking |
| Teaching cooking and Nutrition  Understanding food and food preparation and nutrition | KS1 pupil should know:   * That food comes from plants or animals * Understand that food has to be farmed, caught or grown * Sort food into 5 groups * Know that people should eat at least 5 portions of fruit and veg a day * Prepare simple dishes hygienically and safely without a heat source * Use cooking techniques such as cutting peeling and grating |

**Years 4, 5 and 6- Class 3**

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| Exploring context and existing products | * Identify who made the product, when it was made and what its purpose is * Identify what the product has been made from and **how environmentally friendly the materials are** * Evaluate the product on design, appearance and use * Research facts about famous inventors/chefs/designers linked to product * **Identify the cost of making the product and whether it has any other purpose eg. trend setting** |
| design | * Understand and gather information about what a particular group of people want from a product using questionnaires, surveys etc. * Describe the purpose of their product * Identify design features that will appeal to intended users * Explain how parts of their product will work * **Create a design description of their product** * **Highlight the impact of time, resources and cost within their latest design ideas** * Generate innovative ideas that meet the needs of users |
| planning | * Share and discuss ideas with others * Record a step by step plan for making * Produce lists for the tools, equipment and materials they will be using * Choose materials to use based on their suitability of their properties and aesthetic qualities * Represent ideas in diagrams, annotated sketches and computer based programmes (where appropriate) * Create pattern pieces and prototypes |
| making | KS2 pupils should:  Use materials, construction material and kits, textiles, foods, mechanical and electrical components   * Choose suitable tools for making whilst explaining why they should be used. Use design criteria whilst making. * Follow safety and food hygiene procedures * Measure, mark, cut and shape materials and components accurately * Join, assemble and combine materials and components with some accuracy * **Demonstrate problem solving skills when encountering a mistake or practical problem** * Use finishing techniques**( that involve a number of steps**) such as skills learnt in Art with **some accuracy** |
| Evaluating | * Use design criteria to evaluate product * Identify strengths and areas for development –**looking at the quality of the end product and design and whether it is fit for its intended purpose** * Consider the views of others, including intended user, whilst evaluating product |
| Technical knowledge | At KS2 pupils should know:   * How to use learning from science and maths to design and make products that work * That materials have both functional and aesthetic properties * **That materials can be combined and mixed to create more useful characteristics** * that mechanical and electrical systems have an input, process and output * **the correct technical vocabulary for the projects they are undertaking In early KS2 pupils should also know:** * how mechanical systems such as levers and linkages or pneumatic systems create movement * how simple electrical circuits and components can be used to create functional products * how to program a computer to control their products * how to make strong, stiff shell structures * **that a single fabric shape can be used to make a 3D textiles product** * **that food ingredients can be fresh, pre-cooked and processed**   In late KS2 pupils should also know:   * how mechanical systems such as cams or pulleys or gears create movement * how more complex electrical circuits and components can be used to create functional products * how to program a computer to monitor changes in the environment and control their products * how to reinforce and strengthen a 3D framework * **that a 3D textiles product can be made from a combination of fabric shapes** * **that a recipe can be adapted by adding or substituting one or more ingredients** |
| Teaching nutrition and cooking  Where food comes from  Food preparation, cooking and nutrition | Across: KS2 pupils should know:  • that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world.  In late KS2 pupils should also know:  • that seasons may affect the food available  • **how food is processed into ingredients that can be eaten or used in cooking**  Across KS2 pupils should know:  To prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source  • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking In early KS2 pupils should also know:  • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate  • that to be active and healthy, food and drink are needed to provide energy for the body.  In late KS2 pupils should also know:  **• that recipes can be adapted to change the appearance, taste, texture and aroma**  • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health |