

"Be prepared to change the world with your innovation and creativity."

Design and Technology helps develop creative ideas alongside a broad range of practical skills. It teaches us to take risks and be innovative. It enables us to understand how important design technology is to our world. It has contributed to our history, culture, creativity and the wealth of our nation. We hope that design technology inspires our children and helps them understand the importance of design and innovation.

Being a designer at St George's School means;

- 1. Researching and seeking inspiration:** We use the world around us, available products, books and the internet to research existing products and key designers/engineers/architects that have helped shape the history of design. We use real life contexts to inspire us to design and make products that solve real and relevant problems. This includes engaging with local and national businesses and creating partnerships to develop design technology at St. George's.
- 2. Generating ideas:** We develop the technical skills in drawing, annotating and creating plans, including the use of CAD software, to present a range of ideas from initial concepts to final designs. We use the Iterative design process to regularly evaluate and generate new ideas.
- 3. Making products:** We make products from a range of materials to a high standard. We use a broad range of tools and equipment to do this.
- 4. Evaluating and analysing creative works:** Design and technology involves a lot of analysis and evaluation of products and creative design. We will do this by:
 - Creating questions for analysing and evaluating our own and others' products.
 - Undertaking consumer research and questionnaires.
 - Considering the views others have of our designs and products.
 - Evaluating our own work throughout the design process, adapting and changing ideas, designs and construction methods accordingly. We work using the Iterative design process.
 - Using and evaluating secondary sources such as information books, websites and documentaries.
- 5. Having an awareness of health and nutrition:** We understand the importance of nutrition, a balanced diet and the characteristics of a broad range of ingredients, including seasonality, when choosing and preparing food.
- 6. Learning the basics of food preparation and cooking.** We have opportunities to learn how to prepare food. This will include hygiene, the use of kitchen equipment and basic cooking techniques including chopping, baking and following, or creating, simple recipes from a variety of cultures. Food technology should help us to understand the important of our food choices and give us the skills and inspiration to be creative in the kitchen and try new foods.

We will teach our children to describe design and technology as:

EYFS and KS1	Learn about the objects we use and foods we eat. Design and make products and change our designs to improve them.
Years 3 and 4	Learn about designs and innovations. Design, make and evaluate a variety of products.
Years 5 and 6	Learn about changes in designs and innovations through time. Design, make and evaluate products, changing our designs throughout the process to improve and adapt our original ideas.

We ask key design and technology questions such as:

- What problems can design and technology help solve or improve?
- How does design and technology improve our lives?
- What techniques can we use to help us design our ideas?
- What techniques can we apply to create a product?
- How does design and technology reflect and shape our history?
- Who were the important designers in history?
- How do I think critically about the design of a range of products for different purposes?
- How can the design of products help change the lives of myself and others?
- How could I make this product better / more efficient?

DESIGN TECHNOLOGY CURRICULUM STATEMENT

Essentials and Desirable Aspects of Design and Technology 2021-22

Each year we will review our essentials and desirable aspects of teaching to ensure that we are securing consistent high-quality learning across the school.

Essential in Design Technology	Desirable in Design Technology
<ul style="list-style-type: none"> Ensure that key knowledge, vocabulary Learning Intentions and success criteria have been quality assured before teaching starts. 	<ul style="list-style-type: none"> Shared planning details resources, activities and sequences for learning journey over the unit of work.
<ul style="list-style-type: none"> Ensure that all topics make emphasise cultural capital and enrichment with: <ol style="list-style-type: none"> 3D modelling and use of technology. Product examples / images / books available for all pupils Bought/loaned suitable examples and / or equipment 	<ul style="list-style-type: none"> Explored use of trips/visitors for enrichment.
<ul style="list-style-type: none"> All topics start off using prior learning. Teachers have knowledge of topics taught in previous year groups. 	<ul style="list-style-type: none"> Children can access their prior learning in their design technology books, including from previous years.
<ul style="list-style-type: none"> All planning identifies expectations for SEND support and recording so children can access and communicate their learning in design technology. Might include use of pre-teaching, accessible resources and tools, recordings, annotated images, typed work etc. Do not want different curriculum for SEND pupils. 	
<ul style="list-style-type: none"> Learning is assessed in all lessons using self and peer assessment, formative assessment, review of oral feedback. This feedback is used by pupils to guide their next steps. Children must value their designs continually through a unit NOT just at the end – the iterative design process. Opportunities are built in for this at the planning stage. 	
<ul style="list-style-type: none"> All topics have identified opportunities to enhance learning with links and resources on See-Saw and Google Classroom (beyond curriculum learning). 	<ul style="list-style-type: none"> Specific opportunities for home learning promoted. Should enable peer feedback/celebration on see-saw, google classroom for learning beyond taught curriculum (videos, power-points, podcast clips etc).
<ul style="list-style-type: none"> The skills children need to design and make products are discreetly taught, prior to creating products (focused practical tasks). All children will have the opportunity to show their ideas in a variety of ways, including through drawings, annotated diagrams, cross sectional and exploded diagrams as well as using CAD software where appropriate 	
<ul style="list-style-type: none"> Investigate and evaluate products and inventions using primary and secondary sources to develop and deepen an understanding of design. Examples include :- Actual products, plans, photographs, drawings, historical images (design development) 	<ul style="list-style-type: none"> Make links with designers, inventors or companies as appropriate so children understand how designers work. Upper Key stage 2 Enterprise Council and Fairs / competitions – the £5 challenge – to use D&T skills in real life contexts.
<ul style="list-style-type: none"> Over a two year cycle all children should have the opportunity to develop skills in structures, mechanics - including electronics in years 4 and 6 - and textiles. Food technology, based mainly around savoury dishes, will be done annually. 	
<ul style="list-style-type: none"> Children will all gain basic cookery skills including identifying foods, measuring, mixing, chopping and tasting. 	

DESIGN TECHNOLOGY CURRICULUM STATEMENT

Helping SEND Children Access Design and Technology

We have the highest ambitions for all pupils. Children with SEND needs must be supported to develop their design and technology knowledge and skills.

Accessing Design and Technology	Recording
Use of pre teaching to allow children to access vocabulary and ideas for a lesson or unit of work. Supported with ongoing resources such as pictorial representations	Use word processors, photographs, CAD software and other aids to help children record and capture their learning.
Grouping pupils with care. Evidence shows that manageable mixed-ability grouping or pairing is effective except when carefully planned for a particular purpose such as QFT (pre teaching, feedback etc).	Ensure that as part of QFT. Children are supported to be secure in recording and communicating learning in the lesson. Immediate feedback (in the lesson) has a significant impact on all pupils but especially SEND pupils.
Support above with access to high quality visual resources to: <ul style="list-style-type: none"> Summarise key ideas. Show design ideas Give a sequence of steps to produce something. Pictorial step by step guide. 	Adapting tasks. For example: Giving children sentence stems to evaluate their own , or others work. This could include giving choices of language. <i>Eg I think this is a good design for a soap box because ... It has been strengthened / not strengthened.</i> <ul style="list-style-type: none"> Capture their notes, ideas and observations using photographs and / or digital voice recording.
Ensure that if a child has specific needs re fine motor skills that appropriate adaptations have been considered e.g. specialist scissors or implements to hold items, or an adult to support with these aspects.	Collate this learning on See-Saw/Google classroom so it is not lost.
Ensure that children have time to revisit prior learning before the lessons starts. This might be looking at their book, resources on google classroom. Help strengthen working memory. Encouraged to communicate this using oracy techniques.	Avoid time being wasted on unnecessary tasks that will distract from core learning. Examples for some children include: <ul style="list-style-type: none"> Writing long titles (never ask any child to write out success criteria). Cutting out and sticking in sheets.
Heavily emphasise use of learning intentions and success criteria to specific instructions so there is a clarity and guidance to learning. <ul style="list-style-type: none"> May reduce instructions/number of success criteria steps. May chunk learning into manageable and achievable steps. 	Display these steps as simple visuals with simple explanations if needed. These could be cards they go through to complete the task.
Minimise any auditory or visual barriers with careful seating and support.	
Give children with motor skills or disabilities more space to work in so they are not constricted.	
Food technology lessons will always take into account accessibility for children with specific food allergies etc.	

Cross Curricular Links

Promoting RESPECT

Resilience	Great product design is synonymous with resilience. From Archimedes to Steve Jobs - successful designers have learnt that there is often a struggle to translate ideas to product. Lessons are learnt and mistakes are celebrated. "Success consists of going from failure to failure without loss of enthusiasm." (Winston Churchill)
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DESIGN TECHNOLOGY CURRICULUM STATEMENT

Empathy	Many aspects of great design and technology are driven by an understanding of the needs of others. There are numerous examples that show how design technology can help others. These include designs to help with mobility issues, road safety innovations and technologies helping poorer areas of the world.
Self-Awareness	Children can communicate their self-awareness through D.T. That can include modelling designs, drawing, designing packaging and photography. Artistic expression is a key opportunity to consider personal feelings and those of their audience.
Positivity	Design and food technology is representative of differences in history, cultures, people and beliefs. It allows people to improve the lives of those in their community and beyond. Children should be taught an appreciation of how design and food technology represent diversity and positivity.
Excellence	Design is a field of excellence in this country. We have a wealth of inspirational innovators and chefs to draw upon from Sir Isaac Newton (the reflecting telescope) to Frank Whittle (the turbo jet engine). From Elizabeth David to Heston Blumenthal
Communication and Teamwork	We believe that communication is a core aspect of all design. Children should be encouraged to develop the skills and confidence to communicate their ideas in a variety of ways. We will develop teamwork, encouraging children to design, pitch ideas, construct and reflect in teams as well as individually. In food technology children will work in teams to produce a dish or meal which can then be enjoyed together.

Oracy	Our children should use design and technology as an opportunity to develop their vocabulary, ask questions; present information orally about their learning; undertake discussions; have debates and pitch ideas.
Writing	There are numerous opportunities for high quality writing in design and technology. These include; non chronological reports; instructional writing; explanations and developing high quality evaluative writing.
Reading	Our children will access a wide range of literature in design technology. This will include information texts; primary sources such as products and documents as well as information on computers and the internet.
Humanities	Inventions have shaped the history of many cultures across the world and new technologies have brought both advancements to the human race and challenges. Studying key inventions and the links to human development and interactions is key to understanding social and economic history. In addition, innovations are often linked to a particular environmental need. Knowing about the environment an invention is going to be used in, is important in understanding how something should be designed: i.e. Is it robust enough for the terrain? Can it withstand the weather conditions?
Creative Arts	Drawing, observational skills and the ability to think about aesthetics are all important aspects of design and technology and there are lots of links to be made between design and technology and the creative arts.
STEM	Design and Technology at St. George's is part of STEM because of the huge links with maths, computing and science. In science there are links with growing seasonal vegetables – living things - an understanding of forces, understanding the properties of materials and using electronics. Mathematical skill, such as understanding measure, collecting data and understanding nets and 3D shapes are all used. The technological aspect of the subject is closely linked to and planned through computing.
SMSC	Children develop a wider cultural awareness through projects that link to our industrial heritage as a nation and we seek to expand children's knowledge of cultural influences in design. In addition, understanding the religious beliefs of communities are important in design, especially when preparing food so that it is understood what is and is not acceptable. Through considering dilemmas raised and the impact on the environment when choosing materials, children develop a moral understanding of design. Social skills are developed through encouraging effective conversations and peer evaluation as a vehicle for learning.

DESIGN TECHNOLOGY CURRICULUM STATEMENT

Design and Technology in National Curriculum

Purpose of study

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.

Aims

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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

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

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 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

DESIGN TECHNOLOGY CURRICULUM STATEMENT

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

As part of their work with food, pupils should be taught how to cook and 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.

Pupils should be taught to:

Key Stage 1

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

Key Stage 2

- 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 produced.