



Design and Technology Curriculum



Subject Overview

Design and Technology at Princess Frederica includes the use of a broad range of knowledge, skills, and understanding, and prompts engagement in a wide variety of activities. Pupils design and make products that solve real and relevant problems within a variety of contexts. We aim to nurture creativity and innovation through design and by exploring the designed and made world in which we all live and work. Through evaluation of past and present Design and Technology, the children develop a critical understanding of its impact on daily life and the wider world.

D&T is taught through discrete, meaningful lessons in which, children are taught through the three phases of designing, making and evaluating their own products. Each year group focuses on 3 topics throughout the year and each topic will focus on a separate set of skills. As children progress through the school, they are presented with opportunities to develop these skills, as similar topics are revisited and built upon. In each year group there is a detailed outline of the projects covered as they relate to the Design and Technology National Curriculum. In each year, pupils study three units of DT, usually one per term.

Intent

- Investigate and evaluate existing products.
- Evaluate and analyse creative works using artistic terms.
- Know about great artists, craft makers and designers from different times and cultures.

Implementation

- A design and technology lesson is completed once per term with between 5 to 7 weeks spent on a specific focus.
- In maths, children develop skills around careful use of measuring equipment such as rulers and scales which are skills that are used in design and technology.
- Clubs such as woodwork club aim to develop children's design and technology skills in greater depth.

Impact

- Children can apply skills learnt in other subject areas to the work they are doing in design and technology. (E.g. Children learn about electrical circuits and can then apply this knowledge when making a torch).
- Children develop skills that they can apply to solve a selection of different challenges.
- Children understand the importance of working safely with a range of different tools and resources.

Year 1

Picture Frames

In this unit, children learn about stiffening materials and making stable structures through the context of free-standing photograph frames. The unit uses readily available materials and examples. Children might design a product for their own use or as a gift for a particular user.

Moving Vehicles

This unit builds on children's experiences of joining and combining sheet and reclaimed materials and of using moving joints. They learn about wheels and axles and how to use these when making wheeled vehicles for a specific purpose. They are encouraged to develop their design ideas based on investigating vehicles in the world around them. Work in this unit also offers opportunities to apply basic measuring skills and to draw on knowledge of forces from science.

Link to humanities and The Great Fire of London. Unit is adapted so that children build fire engines.

Sandwiches

Children learn basic food preparation techniques and ways of combining components to create simple food products for a particular purpose. They develop their designing skills by using their own experiences and evaluating existing products to develop ideas. Through discussion, they develop criteria for their design proposals and suggest ways to proceed. They develop their making skills by learning to combine components according to taste, appearance or texture to create a product that contributes to a healthy diet. Through this activity children develop an awareness of health and safety and learn that the quality of the product depends on how well it is made and presented.

Year 2

Money containers

In this unit children learn how textiles containers *eg purses, wallets and belt bags* are designed for different purposes and different users. They design patterns/templates, and join and reinforce fabrics. Children develop their designing skills when evaluating products and use this information to generate their own ideas and identify design criteria. They communicate their early ideas through modelling with paper or inexpensive fabric, and use decorative techniques *eg applique or embroidery*.

Junk Modelling

In this unit children use recyclable materials to make a pirate treasure chest. They explore and test different methods of securing the chest and then use recycled products to make a fastening for their treasure chest.

Links to humanities topic: Pirates

Fruit salads

This unit develops children's understanding of designing and making with food and the importance of healthy eating. They learn about the origins of different fruit and design and make two fruit salads one of which is based on a choice of tropical fruits.

Children investigate and taste different fruits and develop vocabulary to describe the appearance, taste, smell and texture. This activity provides opportunities for children to apply hygienic practices and to use basic tools and equipment effectively and safely.

Links to geography topic: St Lucia

Year 3

Building Bridges

In this unit, children learn about structures. They learn that structures can fail when loaded, and the use of techniques for reinforcing and strengthening structures. They work in a group to design and construct a bridge which will support a 2kg mass using art straws and masking tape among other materials.

Scone-Based Savoury Pizza

Children learn basic food preparation techniques and ways of combining components to create simple food products for a particular purpose. They evaluate a selection of toppings and choose those to use when making their own pizza. They develop their making skills by learning to combine ingredients according to taste, appearance or texture to create a tasty pizza. Through this activity children develop an awareness of health and safety and learn that the quality of the product depends on how well it is made and presented.

Moving Monsters

This unit helps to develop children's understanding of control through investigating simple pneumatic systems and designing and making a model of a monster that has moving parts controlled by pneumatics. This could be linked to stories or poems, or another purpose. A good context is toys to amuse children who are ill in bed. The designing and making assignment requires children to develop skills in working as part of a team.

Year 4

Bread

This unit provides an opportunity to develop children's understanding of, and skills in, working with food through a range of activities related to bread products. They gain knowledge and understanding from investigating existing products and exploring the functions and properties of ingredients. They then draw on this knowledge when designing and making their own bread products. They use a range of skills and techniques using basic food tools and equipment and taking account of appropriate safety and hygiene issues.

Musical Instruments

Children learn about the construction of a range of musical instruments, including those from different times and cultures, and how different sounds can be created and altered to make different notes. They learn to use this knowledge and understanding to design and make a working musical instrument using a combination of materials.

The appearance of the finished product is an additional aspect and the use of techniques to illustrate visual elements could provide a strong link with art. When completed, the instruments could be used by the children *eg to perform a musical composition*.

This unit offers strong links with music in that it provides children with opportunities to investigate, use and listen to a range of musical instruments.

Links to science topic: Sound

Torches

This unit enables children to apply knowledge about electric circuits that they acquire in science in a purposeful way by designing and making a simple torch. While all the designing and making skills will be used, there will be a particular emphasis on defining a set of clear specifications for the torch by considering who will use it and the conditions under which it might be used. The children also consider how the torch can be controlled by designing and making their own switch.

Links to science topic: Electricity

Year 5

Biscuits

This unit develops children's skills, knowledge and understanding of food, building on the previous units in which children prepared food products using simple processes. The children learn how to adapt a basic recipe to develop a product with specified criteria. Investigation of existing products from all cultures will inform design ideas. In this unit, there are also opportunities to develop skills in market research, and data-handling or to develop a link with industry.

Moving Toys

Children learn about controlling movement with a cam mechanism as part of a simple toy. The purpose of the toy is negotiated with the children. They develop their designing skills by using information sources to generate ideas and formulate an understanding of how cam mechanisms can be used to produce movement. They extend their making skills by developing techniques in cutting, shaping and joining to combine components and by selecting tools and equipment to measure and cut accurately. Through these activities they gain an understanding of the working characteristics of the materials and components and how they can be combined to create more useful properties. They consider both functional and decorative attributes in a finished product.

Pop Up Books

In this unit children gain an understanding of linkage-type mechanisms through investigating a range of products *eg books or greetings cards*. Through focused practical tasks, children develop further skills and understanding relating to the construction and assembly of a range of simple mechanisms that can be incorporated into a book with moving parts.

Children research the content of the book and design and make a book that is finished to a high standard, with pages that incorporate moving parts, including linkages and levers. They develop their ability to work in groups as they make decisions about the book and share out tasks.

Year 6

Slippers

In this unit, children learn how products *eg slippers* are designed for different purposes and people. They learn that designers must address a range of needs when designing slippers *eg appearance, safety, warmth and size*. Children learn about making accurate patterns/templates and detailed working drawings. They develop making and finishing skills to enhance the quality of their slippers. They learn to evaluate their products critically against design criteria and identify what to do to improve them.

Shelters

In this unit, children learn about structures. They learn that structures can fail when loaded, and the use of techniques for reinforcing and strengthening structures. They are shown the strength of tubes as a construction material and textiles as a suitable cover for a framework. The main outcome of this unit will be the design and construction of a framework-type shelter for an identified purpose. This can be a model or full-size structure.

Fairground

This unit enables children to gain understanding of an important mechanism, using belts and pulleys, and to learn more about control using electricity and an electric motor. Children can then be introduced to computer control. The focus of the unit is to design and make a model of a fairground ride but it could be adapted to suit any product in which an electric motor produces rotating movement.

National curriculum in England: Design and Technology programmes of study

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.

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:

- 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]

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.

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 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]

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 processed.

Assessment

