



THE RADSTONE

Primary School

LONG TERM PLANNING Design and Technology

Purpose of Study

Design and technology will be taught at The Radstone Primary School using the objectives outlined in the National Curriculum and Development Matters in EYFS. 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. We aim to ensure all children acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils will learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they will be able to develop a critical understanding of its impact on daily life and the wider world.

DT in the Early Years

In Reception children will begin to develop their knowledge of exploring and use media and materials through a variety of planned and independent play based tasks. The EYFS aims for the children to develop the following:

- Manipulate materials to achieve a planned effect.
- Construct with a purpose in mind, using a variety of resources.
- Use simple tools and techniques competently and appropriately.
- Select appropriate resources and adapt work where necessary.
- Select tools and techniques needed to shape, assemble and join materials they are using.

Aims of the Design and Technology national curriculum

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.

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.

EYFS Overview

In the EYFS children will explore Design and Technology through many different ways both independently and with adult support. This will be taught across the year through various weekly themes. Some aspects that will be explored are: construction, cooking, using tools (scissors/hammers/saws), changing materials, junk modelling, designing for a specific purpose, using tools safely and using objects/materials to represent objects/people/events.

Key Stage 1 Overview

	Autumn	Spring	Summer
Year 1	Structures: Constructing Windmills Inspired by the song, 'Mouse in a windmill', the children will design and construct a windmill for a client (mouse) to live in. They will explore various types of windmill, how they work and their key features.	Food: Fruit and Vegetables The children will learn to distinguish between fruit and vegetables and where they grow. They will design a fruit and vegetable smoothie and accompanying packaging. Mechanisms: Making a Moving Storybook The children will explore slider mechanisms and the movement they output, to design, make and evaluate a moving storybook from a range of templates.	Mechanisms: Wheels and Axles The children will learn about the key parts of a wheeled vehicle, to develop an understanding of how wheels, axles and axle holders work. They will design and make a moving vehicle. Textiles: Puppets The children will explore methods of joining fabric. They will design and make a character-based hand puppet using a preferred joining technique, before decorating.
Year 2	Mechanisms: Water Wheels The children will design and create a functional water wheel to help put out the fire during the Great Fire of London! They will learn how different components fit together so that the wheel rotates and the structure stands freely.	Food – A Balanced Diet The children will learn about the food groups (carbohydrates, proteins, fruits and vegetables, dairy, oils and spreads) to understand a balanced diet. They will design and make a healthy wrap.	Textiles – Pouches They will learn how to sew a running stitch ready to design, make and decorate a pouch using a template. Structures – Baby Bear's Chair The children will explore stability and methods to strengthen structures, to understand Baby Bear's chair weaknesses and develop an improved solution for him to use.

Through a variety of creative and practical activities, pupils in Key Stage 1 should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. 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
- 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

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 in Key stage 1 should be taught to:

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

Key Stage 2 Overview

	Autumn	Spring	Summer
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<p>Year 3</p>	<p>Food: Eating Seasonally The children will learn about various fruits and vegetables, and when, where and why they are grown in different seasons. They will discover the relationship between colour and health benefits.</p>	<p>Mechanical System: Pneumatic Toys The children will explore pneumatic systems, then apply this understanding to design and make a pneumatic toy including thumbnail sketches and exploded diagrams.</p> <p>Electrical Systems: Electric Poster The children will be introduced to various forms of 'Information design' before they are briefed to develop an electric museum display based on The Romans.</p>	<p>Structures: Constructing a Castle They will identify and learn about the key features of a castle, before designing and making a recycled-material castle (structure).</p> <p>Textiles: Cushions The children will learn and apply two new sewing techniques – cross-stitch and appliqué. They will utilise these new skills to design and make a cushion.</p>
<p>Year 4</p>	<p>Food: Adapting an Indian Recipe The children will work in groups to adapt an existing recipe, whilst taking into account the cost of the ingredients and other expenses against a set budget.</p> <p>Digital World: Mindfulness Moments Timer Explore what is meant by mindfulness and write design criteria to fulfil a brief to develop a programmed product for timing a mindful moment.</p>	<p>Structures: Pavilions The children will investigate and model frame structures to improve their stability, then apply this research to design and create a stable, decorated pavilion.</p>	<p>Textiles: Fastenings The children will analyse and evaluate a range of existing fastenings, then devise a list of design criteria to design, generate templates and make a fabric book sleeve.</p> <p>Mechanical Systems: Making a Slingshot Car Using a range of materials, the children will design and make a car with a working slingshot mechanism and house the mechanism using a range of nets.</p>
<p>Year 5</p>	<p>Electrical Systems: Electronic Greeting Cards The children will learn about the development of exchanging personal messages, to the invention of the Penny Black stamp. They will develop an electronic greeting card, using paper-applicable circuit components.</p>	<p>Mechanical Systems: Making a Pop-up Book The children will create a functional four-page pop-up storybook design, using lever, sliders, layers and spacers to create paper-based mechanisms.</p> <p>Digital World: Monitoring Devices Apply Computing knowledge and understanding to program a Micro: bit animal monitoring device. Develop 3D CAD skills by learning how to navigate the Tinkercad interface and essential tools to combine multiple objects.</p>	<p>Food: What Could be Healthier The children will discover the farm to fork process and understand the key welfare issues for rearing cattle. They will compare the nutritional value of existing sauces and develop a healthier recipe.</p> <p>Structures: Bridges Test and analyse various types of bridge to determine their strength and stability. Explore material properties and sources, before marking, sawing and assembling a wooden truss bridge.</p>

<p>Year 6</p>	<p>Structures: Playgrounds</p> <p>The children will research existing playground equipment and their different forms, before designing and developing a range of apparatus to meet a list of specified design criteria.</p>	<p>Mechanical Systems: Automata Toys</p> <p>Develop a functional automata window display, to meet the requirements in a design brief. Explore and create cam, follower and axle mechanisms to mimic different movements.</p>	<p>Food: Come Dine with Me/Great British Dishes</p> <p>Develop a three-course menu focused on three key ingredients, as part of a paired challenge to develop the best class recipes. Explore each key ingredient's farm to fork process.</p> <p>Electrical Systems: Steady Hand Game</p> <p>Understand what is meant by fit for purpose design and form follows function. Design and develop a steady hand game using a series circuit, including housing and backboard.</p>
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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] ➤
Apply their understanding of computing to program, monitor and control their products.

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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 in Key Stage 2 should be taught to:

- 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.