



## Design and Technology KS 1

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. 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.

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.

Lessons follow the Kapow Primary Scheme of Work and ensure that skills and subject knowledge build upon previous learning.

At Dane Ghyll Community Primary School pupils will be taught:

### 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.

## Design and Technology – KS1

### Year 1

#### **Structures: Construction a windmill**

Children will be:

- Creating a stable structure
- Using tools and equipment accurately
- Joining parts of a structure
- Evaluating structures

#### **Textiles: Puppets**

Children will be:

- Joining fabrics
- Using templates
- Decorating puppets

#### **Cooking and Nutrition: Smoothies**

Children will be:

- Identifying and describing where fruit and vegetables grow
- Practising food preparation skills
- Selecting ingredients for a recipe
- Apply food preparation skills
- Evaluating against a design brief

### Year 2

#### **Structures: Baby bear's chair**

Children will be:

- Exploring features of structures and stability
- Experimenting with how shape affects strength of a structure
- Making a structure according to a criteria
- Producing and evaluating a finished structure

#### **Mechanisms: Fairground wheel**

Children will be:

- Exploring wheel mechanisms
- Designing a fairground wheel
- Selecting materials to build with
- Building a moving wheel
- Conducting surveys to gather opinions
- Evaluating structures

#### **Mechanisms: Making a moving monster**

Children will be:

- Looking at objects and understanding how they move
- Exploring different design options
- Making a moving monster

## Key Skills Progression

Over the year, children will develop the following skills:

- Finding the middle of an object.
- Puncturing holes.
- Adding weight to structures.
- Creating supporting structures.
- Cutting different materials evenly and carefully.
- Evaluating and improving a product.
- Using a template to create a design for a puppet.
- Using joining methods to decorate a puppet.
- Chopping fruit and vegetables safely to make a smoothie.
- Juicing fruits to make a smoothie.
- Learning where and how fruits and vegetables grow.
- Tasting and evaluating different foods.

Over the year, children will develop the following skills:

- Generating and communicating ideas using sketching and modelling.
- Learning about different types of structures, found in the natural world and in everyday objects.
- Making a structure according to design criteria.
- Creating joints and structures from paper/card and tape.
- Building a strong and stiff structure by folding paper.
- Exploring the features of structures.
- Comparing the stability of different shapes.
- Identifying the weakest part of a structure.
- Testing and evaluating their own structures.
- Conducting simple surveys to gather opinions.

- Describing appearance, smell and taste.

- Using a simple design brief that outlines the intended use, target user, and key features of the product, to create simple design criteria.
- Creating ideas with design criteria in mind.
- Using labels to explain parts of a design, label materials, etc.
- Knowing that drawings can help explain how something works.
- Choosing materials, ingredients or components from a wider range of materials, ingredients or components and explaining their choices.
- Knowing some properties of materials.
- Following and recalling simple safety instructions.
- Knowing that some tools are sharp like scissors and knives.
- Beginning to shape objects to improve how they work.
- Evaluating existing products and their own ideas and creations against simple design criteria.
- Creating a design criteria as a class.
- Designing a moving monster for a specific audience
- Making linkages using card for levers and split pins for pivots.
- Experimenting with linkages adjusting the widths, lengths and thicknesses of card used.
- Cutting and assembling components neatly.
- Evaluating own designs against design criteria.



## Design and Technology KS 2

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. 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.

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Lessons follow the Kapow Primary Scheme of Work and ensure that skills and subject knowledge build upon previous learning. At Dane Ghyll Community Primary School pupils will 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.

### Cooking and nutrition

- 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.

## Design and Technology – KS2

Year 3	Year 4	Year 5	Year 6
<p><b><u>Cooking and Nutrition: Eating seasonally</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Explaining why food comes from different places and the benefits of seasonal foods</li> <li>• Developing cutting and peeling skills</li> <li>• Evaluating seasonal ingredients</li> <li>• Designing mock-ups</li> <li>• Evaluating dishes</li> </ul> <p><b><u>Digital world: Wearable technology</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Researching and evaluating existing products</li> <li>• Developing design criteria</li> <li>• Using code to program and control a product</li> <li>• Developing ideas through computer-aided design</li> <li>• Improving designs using feedback</li> </ul> <p><b><u>Structures: Constructing a castle</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Recognising how shapes are combined to form strong structures</li> <li>• Designing a castle</li> <li>• Constructing 3D Nets</li> <li>• Constructing and evaluating a final product</li> </ul>	<p><b><u>Structure: Pavilions</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Creating a range of different shaped frame structures</li> <li>• Designing a pavilion</li> <li>• Building a frame structure</li> <li>• Adding cladding to a frame structure</li> </ul> <p><b><u>Mechanical systems: Making a slingshot car</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Producing a functioning car chassis</li> <li>• Designing and constructing a car body</li> <li>• Investigating reducing air resistance through design of a shape.</li> <li>• Conducting a trial</li> <li>• Suggesting improvements</li> </ul> <p><b><u>Electrical systems: Torches</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Learning about electrical items and how they work</li> <li>• Analysing and evaluating electrical products</li> <li>• Design a product to fit user needs.</li> <li>• Making and evaluating a torch.</li> </ul>	<p><b><u>Electrical systems: Doodlers</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Understanding how motors are used in electrical products</li> <li>• Investigating existing products</li> <li>• Using research to develop products</li> <li>• Develop DIY kits</li> </ul> <p><b><u>Mechanical systems: Making a Pop-Up book</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Designing a pop-up book</li> <li>• Following a design brief</li> <li>• Using layers and spaces to cover mechanisms</li> <li>• Creating a high-quality product</li> </ul> <p><b><u>Cooking and nutrition: Developing a recipe</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Learning how ingredients are reared and processed</li> <li>• Making adaptations to design a recipe</li> <li>• Evaluating nutritional content</li> <li>• Practising food preparation skills</li> <li>• Designing a product label</li> <li>• Following and making an adapted recipe</li> </ul>	<p><b><u>Textiles: Waistcoats</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Designing a waistcoat</li> <li>• Marking and cutting fabric</li> <li>• Assembling a waistcoat</li> <li>• Decorating a waistcoat</li> </ul> <p><b><u>Structures: Playgrounds</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Designing a variety of structures</li> <li>• Building a range of structures</li> <li>• Improving and adding detail to structures</li> <li>• Creating a surrounding landscape for structures</li> </ul> <p><b><u>Digital world: Navigating the world</u></b> Children will be:</p> <ul style="list-style-type: none"> <li>• Writing a design brief and criteria based on a request</li> <li>• Writing a program to include multiple functions as part of a navigation device</li> <li>• Developing a sustainable product concept</li> <li>• Producing a virtual model</li> <li>• Presenting a pitch to 'sell' a product</li> </ul>

## Key Skills Progression

Over the year, children will develop the following skills:

- Describe how climate affects where food grows
- Identify and taste seasonal ingredients
- Peeling and cutting ingredients safely
- Follow recipes
- Problem solving
- Draw 2D shapes
- Developing design ideas, responding to a brief
- Analysing and evaluating existing products
- Use feedback to improve a design
- Designing using Computing Aided Design software
- Designing to appeal to a specific audience or purpose
- Construct 3D shapes using nets
- Evaluate their own and others work.

Over the year, children will develop the following skills:

- Design structures
- Select appropriate materials
- Build frame structures to support weight
- Make a range of structures in different shapes and sizes
- Create different textural effects
- Create a design using a plan
- Create success criteria
- Drawing a net to create a structure from
- Measuring, marking, cutting and assembling with increasing accuracy
- Personalising designs
- Evaluating work based on criteria
- Using appropriate equipment to cut and attach materials
- Make a torch with a working circuit and switch
- Assemble a torch according to design and success criteria
- Evaluate exciting products
- Testing and evaluating a final product

Over the year, children will develop the following skills:

- Identify factors that could be changed on existing products, thinking about how these would alter the product
- Develop design criteria based on findings that clarifies target audience
- Make a functional series circuit with a motor
- Construct a product using design criteria
- Creating steps for others to follow
- Carrying out product analysis
- Analysing if functions changed positively or negatively affect an existing product
- Peer evaluating instructions
- Design a pop up book that uses structures and mechanisms
- Name mechanisms, input and output accurately
- Make mechanisms using sliders, pivots and folds to make movement
- Hide workings to produce an aesthetically pleasing result
- Follow a design brief to make a pop-up book
- Evaluate work of others and receive feedback
- Research existing recipes
- Suggest alternative ingredients
- Analyse nutritional content
- Understanding cross-contamination
- Using food preparation skills
- Make a developed recipe

Over the year, children will develop the following skills:

- Design, develop and annotate ideas according to specification and design criteria
- Use templates to pin panels on fabric
- Mark and cut fabric accurately
- Sew using a running stitch
- Decorate fabrics
- Evaluate work continually
- Consider effective and ineffective designs
- Measure, mark and cut wood
- Improve a design plan
- Test and adapt a design to improve as it is developed
- Identify what makes a successful structure
- Write and develop a design brief for a client
- Use Computer Aided Design
- Consider materials and their properties
- Explain material choices, developing an awareness of sustainability
- Program a compass
- Explain the functions of a tool