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.

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 to:

<u>Design</u>

- 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

<u>Make</u>

- 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

<u>Evaluate</u>

- 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

<u>Technical knowledge</u>

- 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.

<u>Cooking and nutrition</u>

- 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

Cooking and Nutrition: Eating seasonally

Children will be:

- Explaining why food comes from different places and the benefits of seasonal foods
- Developing cutting and peeling skills
- Evaluating seasonal ingredients
- Designing mock-ups
- Evaluating dishes

Digital world: Wearable technology

Children will be:

- Researching and evaluating existing products
- Developing design criteria
- Using code to program and control a product
- Developing ideas through computer-aided design
- Improving designs using feedback

Structures: Constructing a castle

Children will be:

- Recognising how shapes are combined to form strong structures
- Designing a castle
- Constructing 3D Nets
- Constructing and evaluating a final product

Year 4

Structure: Pavilions

Children will be:

- Creating a range of different shaped frame structures
- Designing a pavilion
- Building a frame structure
- Adding cladding to a frame structure

Mechanical systems: Making a slingshot car

Children will be:

- Producing a functioning car chassis
- Designing and constructing a car body
- Investigating reducing air resistance through design of a shape.
- Conducting a trial
- Suggesting improvements

Electrical systems: Torches

Children will be:

- Learning about electrical items and how they work
- Analysing and evaluating electrical products
- Design a product to fit user needs.
- Making and evaluating a torch.

Year 5

Electrical systems: Doodlers

Children will be:

- Understanding how motors are used in electrical products
- Investigating existing products
- Using research to develop products
- Develop DIY kits

Mechanical systems: Making a Pop-Up book

Children will be:

- Designing a pop-up book
- Following a design brief
- Using layers and spaces to cover mechanisms
- Creating a high-quality product

Cooking and nutrition: Developing a recipe

Children will be:

- Learning how ingredients are reared and processed
- Making adaptations to design a recipe
- Evaluating nutritional content
- Practising food preparation skills
- Designing a product label
- Following and making an adapted recipe

Year 6

Textiles: Waistcoats

Children will be:

- Designing a waistcoat
- Marking and cutting fabric
- Assembling a waistcoat
- Decorating a waistcoat

Structures: Playgrounds

Children will be:

- Designing a variety of structures
- Building a range of structures
- Improving and adding detail to structures
- Creating a surrounding landscape for structures

Digital world: Navigating the world

Children will be:

- Writing a design brief and criteria based on a request
- Writing a program to include multiple functions as part of a navigation device
- Developing a sustainable product concept
- Producing a virtual model
- Presenting a pitch to ‘sell’ a product

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