Subject Specific Planning Documents Design Technology

Whole School Curriculum Aims

Intent

The school aims to:

- Inspire pupils to be innovative and creative thinkers who have an appreciation for the product design cycle
- Develop the confidence of children to take risks through drafting design concepts, modelling and testing
- Enable children to be reflective learners who evaluate their work and the work of others
- Build an awareness of the impact of design and technology on our lives and encourage pupils to become resourceful, enterprising citizens
- Encourage children to build on their skills to contribute to future design advancements

Implementation

Teachers will:

- Follow the three main stages of the design process; design, make and evaluate
- Follow the progression of skills and knowledge within the scheme of work
- Have a secure understanding of the technical knowledge and language by using the relevant planning materials to support them
- Plan their D&T strand to ensure all four lessons can be completed in one day per half term
- Ensure children have the time and access to quality resources to allow children to become confident and proficient in D&T skills

Impact

Children will be able to (and subject leaders will regularly monitor this):

- Understand how to use and combine tools to carry out different processes for shaping, decorating and manufacturing products
- Build and apply a repertoire of skills, knowledge and understanding to produce high quality, innovative outcomes
- Understand and apply the principles of healthy eating, diets and recipes, including key processes, food groups and cooking equipment
- Recognise where our decisions can impact the wider world in terms of community, social and environmental issues
- Self-evaluate and reflect on learning at different stages and identify areas to improve

Overview of Subject Content

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 1
Reception	Salt Dough Fossils	Shadow Puppets	Artic Models	Supertato Models	Mini-beast Models	
Year 1	Food: Fruit & Vegetables		Mechanisms: Moving story book		Textiles: Puppets	
Year 2	Pudding Lane Houses		Structures: Baby bear's chair		Mechanisms: Moving monster	
Year 3	Making decorations: cross stitch			Constructing a Roman Fort	Food: Eating seasonally	
Year 4	Mechanical systems: making a slingshot car			Food: Adapting a recipe	Electrical systems: Posters	
Year 5	A Mexican Feast		Electrical systems: Doodlers		Structures: bridges	
Year 6		Cooking & Nutrition- Come Dine with Me	Electrical systems: steady hand game		Textiles: Making a waistcoat	

The six key areas are revisited each year, with Electrical systems and Digital world beginning in KS2. The areas enable all subject leads, specialists or non-specialists, to understand and make it easy for teachers to see prior and future learning for your pupils. You can see, at a glance, how the unit you are teaching fits into their wider learning journey.

Cooking & Nutrition	Mechanisms/Mechanical Systems	Structures	Textiles	Electrical Systems	Digital World
Where food comes from, balanced diet, preparation and cooking skills. Kitchen hygiene and safety. Following recipes	Mimic natural movements using mechanisms such as cams, followers, levers and sliders.	Material functional and aesthetic properties, strength and stability, stiffen and reinforce structures.	Fastening, sewing, decorative and functional fabric techniques including cross stitch, blanket stitch and appliqué.	Operational series circuits, circuit components, circuit diagrams and symbols, combined to create various electrical products.	Program products to monitor and control, develop designs and virtual models using 2D and 3D CAD software.

The design process The Design and technology National Curriculum outlines the three main stages of the design process: design, make and evaluate. Each Kapow Primary unit follows these stages, to form a full project. Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical and technical understanding, required for each strand.

Design	Make	Evaluate
★ Research ★ Design criteria (e.g. tailoring to an audience/user). ★ Idea generation (e.g. annotated sketches). ★ Idea development (e.g. templates, pattern pieces.). ★ Models and prototypes (both virtual and physical). ★ Cross-sectional and exploded diagrams. ★ Innovative, fit-for-purpose and functional product solutions to design problems.	★ Select and use appropriate tools and equipment. ★ Understand and select materials and components (including ingredients) based on their aesthetic and functional properties. ★ Carry out practical tasks with increasing accuracy and precision. ★ Understand the importance of, and follow the health and safety rules.	★ Explore existing products. ★ Evaluate against a list of design criteria. ★ Evaluate, investigate and analyse existing products. ★ Evaluate their own and others' ideas. ★ Understand how key events and individuals have helped to shape the world of D&T. ★ Consider feedback to make improvements.

Cooking and nutrition* has a separate section in the D&T National Curriculum, with additional focus on specific principles, skills and techniques in food, including where food comes from, diet and seasonality. Food units still follow the design process summarised above, for example by tasking the pupils to develop recipes for a specific set of requirements (design criteria) and to suggest methods of packaging the food product including the nutritional information.

Progression of skills for Design Technology

Key Stage 1 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. Schools are not required by law to teach the example content in [square brackets]

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

	Structures:	**Mechanisms:**	**Textiles:**	**Electrical systems (KS2 only)**	**Digital world (KS2 only)**	**Cooking & Nutrition**
How our scheme delivers the National Curriculum	Build structures such as chairs, exploring how they can be made stronger, stiffer and more stable. Recognise areas of weakness through trial and error.	Introduce and explore simple mechanisms, such as sliders in their designs. Recognise where mechanisms such as these exist in toys and other familiar products.	Explore different methods of joining fabrics and experiment to determine the pros and cons of each technique.			Learn about the basic rules of a healthy and varied diet to create dishes. Understand where food comes from, for example plants and animals.

Key Stage 2 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. Schools are not required by law to teach the example content in [square brackets] **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] • apply their understanding of computing to program, monitor and control their products

How our scheme delivers the National Curriculum						
	Structures: Continue to develop KS1 exploration skills, through more complex builds such as bridge designs. Understand material selection and learn methods to reinforce structures.	**Mechanical systems:** Extend pupils understanding of individual mechanisms, to form part of a functional system, for example: Automatas, that use a combination of cams and axles/shaft.	**Textiles:** Understand that fabric can be layered for effect, recognising the appearance and technique for different stitch and fastening types, including their: ● Strength. ● Appropriate use. ● Design.	**Electrical systems:** Create functional electrical products that use series circuits, incorporating different components such as bulbs and motors. Consider how the materials used in these products can: ● Protect the circuitry. ● Reflect light. ● Conduct electricity. ● Insulate.	**Digital world:** Learn how to develop an electronic product with processing capabilities. Apply Computing principles to program functions within a product including to control and monitor it. Understand how the history and evolution of product design lead to the on-going Digital revolution and the impact it is having in the world today.	**Cooking & Nutrition:** Understand and apply the principles of a healthy and varied diet to prepare and cook a variety of dishes using a range of cooking techniques and methods. Understand what is meant by seasonal foods. Know where and how ingredients are sourced.

Reception End Points

Develop their small motor skills so that they can use a range of tools competently, safely and confidently.	Return to and build on their previous learning, refining ideas and developing their ability to represent them.	Create collaboratively, sharing ideas, resources and skills.

Year 1 End Points

Fruit & Vegetables	Moving Story book	Puppets
Children can name a variety of common fruit and vegetables. Children can explain how to tell the difference between fruit & vegetables. Children can explain where some common fruit or vegetables grow. Children can explain which parts of a plant we eat.	Children can explain how they can make characters in a storybook move with a mechanism. Children can explain what a mechanism is. Children can use correct vocabulary to explain how a mechanism moves in a book, e.g. up, down, side to side, left and right.	Children can explain how to join parts. Children can use a template. Children can explain which joining technique is the most suitable for different products.

Year 2 End Points

Pudding Lane Houses	Baby bear's chair	Moving Monsters
Children can explain what a mechanism is. Children can explain what a structure is. Children can explain what stable, strong, weak, flexible and stiff mean. Children can label the main parts of the house and explain how the parts works.	Children can explain the difference between a natural and a manmade object. Children can explain the function of a chair. Children can explain why a product needs testing before use. Children can explain what stable, strong, weak, flexible and stiff mean.	Children can explain what a mechanism is. Children can explain what a design criteria is. Children can use terminology such as lever, pivot and linkage correctly. Children can explain what an input and an output is. Children can describe the movement a mechanism makes.

Year 3 End Points

Decorations	Constructing a Roman Fort	Eating seasonally
Children can explain how to join materials. Children can explain what a template is. Children can describe 'applique' technique. Children can describe a running stitch and a cross-stitch. Children can explain what a seam is.	Children can explain the difference between a natural and a manmade object. Children can explain what a façade is. Children can explain what a feature is. Children can explain what a paper net is and why we use one. Children can design a fort and explain what makes it a good design. Children can list the features of a fort.	Children can explain what a diet is and what makes a healthy diet. Children can explain what a nutrient is. Children can explain what vitamins, minerals and fibre do. Children can explain what seasonal food is. Children can explain how to stay safe in the kitchen. Children can explain how the climate affects what we can grow in our country.

Year 4 End Points

Making a slingshot car	Adapting a recipe	Electric Poster
Children can explain what a mechanism is. Children can explain what an exploded-diagram is. Children can explain what aesthetics are. Children can explain what air resistance is. Children can explain what a template is. Children can explain why is it important to test and evaluate a product.	Children can explain what a recipe is. Children can explain what a food in season is. Children can explain how to stay safe in the kitchen. Children can explain different cooking techniques. Children can explain how to improve a recipe. Children can explain basic hygiene in a kitchen.	Children can explain what electricity is. Children can explain what a circuit diagram is. Children can explain electrical symbols. Children can explain what a conductor and an insulator is. Children can explain what a series circuit is. Children can explain what a portable form of electricity. Children can list some electrical health and safety tips.

Year 5 End Points

What could be healthier?	Electronic greeting cards	Bridges
Children can explain what a balanced diet consists of. Children can explain what cross-contamination in a kitchen means and how it happens. Children can explain what welfare means. Children can explain the 'farm to fork' process. Children can give an example of a healthy meal and explain why it is healthy.	Children can explain who Sir Rowland Hill was and how his invention changed the world. Children can explain what a product analysis is. Children can explain what a series circuit is.	Children can name common tools, e.g. file, screwdriver, chisel and what they are used for. Children can explain what a try square or a set square are. Children can name different types of bridges, e.g. truss, beam, arch. Children can explain how the design of a bridge distributes the weight evenly. Children can explain the properties of different materials.

Year 6 End Points

Come dine with me	Steady hand game	Waistcoat Design
Children can write and follow a recipe and make adaptations using their own research. Children can work safely and hygienically to a given timescale. Children can evaluate a recipe, suggesting points for improvements. Children can evaluate health and safety in production to minimise cross contamination.	Children can explain what product analysis is. Children can explain what a series circuit is. Children can explain what we mean by form over function. Children can explain what a buzzer is. Children can explain what a LED circuit is. Children can explain what happens when a rod touches the wire in a steady hand game.	Children can consider a range of factors in their design criteria and use this to create a waistcoat design. Children can use a template to mark and cut out a design. Children can use a running stitch to join fabric to make a functional waistcoat. Children can attach a secure fastening, as well as decorative objects. Children can evaluate their final product.