

Design and Technology Curriculum

Intent

At Bacton we believe that Design and Technology should be 'Inspiring, rigorous and practical'. It will allow children to use their imagination and creativity to design and make a range of products within a variety of contexts. We aim to inspire pupils to be innovative and creative thinkers who have an appreciation for the product design cycle through ideation, creation, and evaluation. We want pupils to develop the confidence to take risks, through drafting design concepts, modelling, and testing and to be reflective learners who evaluate their work and the work of others. Through our scheme of work, we aim to build an awareness of the impact of design and technology on our lives and encourage pupils to become resourceful, enterprising citizens who will have the skills to contribute to future design advancements.

Link to SMSC

At Bacton we believe that spiritual, moral, social and cultural education should be evident in everything we do. Giving children the opportunity to think creatively and solve problems lies at the centre of Design and Technology. The creativity and innovation the children show will be inspirational to others whilst also increase each child's self-confidence and belief in their own abilities. The children will be introduced to new technology and designs, leading to awe and wonder at the beauty of a final product. During the planning and making process we encourage our pupils to consider the moral and ethical dilemmas raised. For example, the impact on the environment through the choices of materials are made or the opportunity to consider sustainable or environmentally acceptable materials. All of which links to the global goals the school's curriculum is based upon. During DT there are many opportunities to promote social responsibilities. All the children have a collective responsibility to ensure they contribute to a safe working environment where the use of tools and equipment are involved. There is the opportunity to work collaboratively with a partner or take turns in a small group which requires effective social interaction and at times compromise. There is also the opportunity for peer evaluation and to act as a critical friend to give supportive comments to improve pupils learning outcomes. The children will also be given various dilemmas linked to DT, where they will need to create a product which will help to overcome a problem, encouraging the children to become problem solvers and understand the needs of the world. DT often originates from an idea or artefact and to develop a wider cultural awareness we explore our past heritage as well as investigate and use as our stimulus foods, textiles, pottery and sculptures from different cultures and periods of time from across the world.

Subject Implementation

The teaching of Design Technology across the school will be through the Kapow scheme of work, a spiral scheme designed to increase the depth of knowledge and build on prior learning throughout primary school. Kapow allows children to design products with a purpose in mind and an intended user of the products. Food technology is implemented across the school with children developing an understanding of where food comes from, the importance of a varied and healthy diet and how to prepare this.

Design and technology is a crucial part of school life and learning and it is for this reason that as a school we are dedicated to the teaching and delivery of a high quality Design and Technology curriculum; through well planned and resourced projects and experiences. It is an inspiring, rigorous, and practical subject, requiring creativity, resourcefulness, and imagination. Pupils will design and make products that solve real and relevant problems within a variety of contexts. It can be cross - curricular and draws upon subject knowledge and skills within Mathematics, Science, History, Computing and Art. Children learn to take risks, be reflective, innovative, enterprising, and resilient. Through the evaluation of past and present technology they can reflect upon the impact of Design Technology on everyday life and the wider world.

Many DT units will be delivered in a focus week as a block of learning to enable emersion in learning and making best use of curriculum time due to the practicalities of delivering practical and technical learning in a regular classroom environment.

Strong subject knowledge is vital for staff to be able to deliver a highly effective and robust Design and technology curriculum. Each unit of Kapow lessons includes multiple teacher videos to develop subject knowledge and support ongoing CPD. Kapow has been created with the understanding that many teachers do not feel confident delivering the full Design and technology curriculum and every effort has been made to ensure that they feel supported to deliver lessons of a high standard that ensure pupil progression.

EYFS

The table below demonstrates which statements from the 2020 Development Matters are prerequisite skills for DT within the national curriculum. It outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework to match the programme of study for DT.

The most relevant statements for DT are taken from the following areas of learning:

- Physical Development
- Expressive Arts and Design

Reception	Physical Development	<ul style="list-style-type: none"> • Progress towards a more fluent style of moving, with developing control and grace. • Develop their small motor skills so that they can use a range of tools competently, safely and confidently. • Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.
	Expressive Arts and Design	<ul style="list-style-type: none"> • Explore, use and refine a variety of artistic effects to express their ideas and feelings. • Return to and build on their previous learning, refining ideas and developing their ability to represent them. • Create collaboratively, sharing ideas, resources and skills.

ELG	Physical Development	Fine Motor Skills	<ul style="list-style-type: none"> • Use a range of small tools, including scissors, paintbrushes and cutlery.
	Expressive Arts and Design	Creating with Materials	<ul style="list-style-type: none"> • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Share their creations, explaining the process they have used.

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 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.

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 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, such as 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 as gears, pulleys, cams, levers and linkages)
- understand and use electrical systems in their products, (for example series circuits incorporating switches, bulbs, buzzers and motors)
- to apply their understanding of computing to programme, monitor and control their products.

Subject Impact

The impact of the Kapow scheme can be constantly monitored through both formative and summative assessment opportunities. Each lesson includes guidance to support teachers in assessing pupils against the learning objectives. Furthermore, each unit has a unit quiz and knowledge catcher which can be used at the start and/ or end of the unit. After the implementation of Kapow Primary Design and technology, pupils should leave school equipped with a range of skills to enable them to succeed in their secondary education and be innovative and resourceful members of society. The expected impact of following the Kapow Primary Design and technology scheme of work is that children will:

- Understand the functional and aesthetic properties of a range of materials and resources.
- 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, including models, prototypes and products to fulfil the needs of users, clients, and scenarios.
- Understand and apply the principles of healthy eating, diets, and recipes, including key processes, food groups and cooking equipment.
- Have an appreciation for key individuals, inventions, and events in history and of today that impact our world.
- 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.
- Meet the end of key stage expectations outlined in the National curriculum for Design and technology.

How does Kapow align with the National Curriculum?

Our scheme of work fulfils the statutory requirements outlined in the **national curriculum (2014)**. The national curriculum Programme of study 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

We have identified five key strands which run throughout our scheme of work:

Design

Make

Evaluate

Technical knowledge

Cooking and nutrition

Curriculum Progression

	Structures	Mechanisms	Textiles	Electrical systems	Digital world	Cooking and nutrition
KS1	Build structures such as windmills and 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, wheels and axles 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.	<p>KS2 only* Create functional electrical products that use series circuits, incorporating different components such as bulbs, LEDs, switches, buzzers and motors.</p> <p>Consider how the materials used in these products can:</p>	<p>KS2 only* Learn how to develop an electronic product with processing capabilities.</p> <p>Apply Computing principles to program functions within a product including to control and monitor it.</p>	<p>Learn about the basic rules of a healthy and varied diet to create dishes.</p> <p>Understand where food comes from, for example plants and animals.</p>
KS2	Continue to develop KS1 exploration skills, through more complex builds such as pavilion and bridge designs. Understand material selection and learn methods to reinforce structures.	<p>Mechanical systems</p> <p>Extend pupils understanding of individual mechanisms, to form part of a functional system, for example: Automatas, that use a combination of cams, followers, axles/shaft, cranks and toppers.</p>	<p>Understand that fabric can be layered for effect, recognising the appearance and technique for different stitch and fastening types, including their:</p> <ul style="list-style-type: none"> • Strength. • Appropriate use. • Design. 	<ul style="list-style-type: none"> • Protect the circuitry. • Reflect light. • Conduct electricity. • Insulate. 	<p>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.</p>	<p>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.</p> <p>Understand what is meant by seasonal foods.</p> <p>Know where and how ingredients are sourced.</p>

Long term plan

Phase		Unit 1	Unit 2	Unit 3
EYFS		On-going activities throughout the year		
Key Stage One	Year 1	Textiles: Puppets <i>Links with History- toys; science- materials</i>	Structures: Constructing Windmills.	Food: Fruit and Vegetables
	Year 2	Mechanics: Moving story book (link with penguins)	Textiles: Pouches	Food: A balanced diet
Lower Key stage Two	Year 3	Textiles: Cross stitch and applique cushions	Structures: Constructing a castle	Food: Adapting a recipe
	Year 4	Electronics: Design and make a torch. <i>Links with science- electricity</i>	Mechanics: Making pneumatic toys	Food: Eating seasonally <i>Links with geography- living sustainably.</i>
Upper Key Stage Two	Year 5	Mechanical systems: Making a pop-up book	Textiles: Stuffed toys	Food: What could be healthier?
	Year 6	Structures: Bridges	Food: Come dine with me	Electrical Systems: Design and make a steady hand game