



Birchwood Avenue Primary School

Educating Hearts and Minds through Design and Technology



Intent:

At Birchwood Avenue Primary School, we want the children to be inspired by their practical learning. The children will design and make products that solve problems that they are introduced to. Before making a product, the children will evaluate past and present designs. Evaluating these products will allow the children to make decisions when approaching their own learning. They will understand the purpose of their learning and the learning journey will give them the skills that they need to be successful when creating a product independently. When evaluating their own work, the children will consider the impact of their design on daily life and the world that they live in. They will acquire a broad range of subject knowledge and draw on other curriculum areas such as mathematics, science, engineering, computing and art.

Design and Technology Syllabus:

At Birchwood Avenue, we use Kapow to complement the teaching and learning of Design and Technology. The scheme shares our vision of providing learning opportunities that inspires 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 curriculum, 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. Kapow Primary's Design and technology scheme of work enables pupils to meet the end of key stage attainment targets in the national curriculum and the aims also align with those in the national curriculum.

Aims

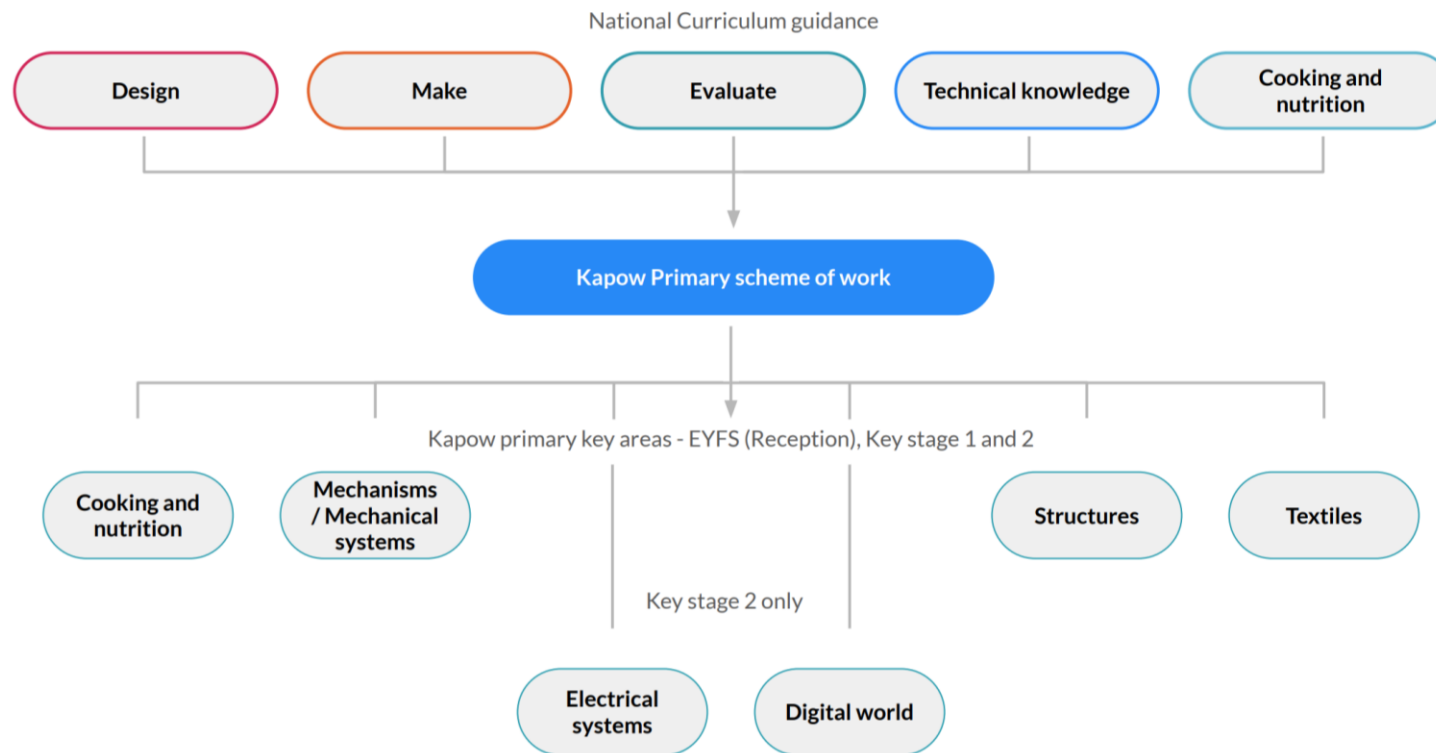
- The national curriculum for design and technology aims to ensure that all pupils:
- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, 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

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Design and Technology Curriculum

How is the Design and technology scheme of work organised?



Key areas

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.

EYFS (Reception) Key Stage 1 and 2

Food

Where food comes from, balanced diet, preparation and cooking skills. Kitchen hygiene and safety. Following recipes.



Mechanisms/ Mechanical systems

Mimic natural movements using mechanisms such as cams, followers, levers and sliders.



Structures

Material functional and aesthetic properties, strength and stability, stiffen and reinforce structures.



Textiles

Fastening, sewing, decorative and functional fabric techniques including cross stitch, blanket stitch and appliqué.



Key Stage 2

Electrical systems

Operational series circuits, circuit components, circuit diagrams and symbols, combined to create various electrical products.



Digital world

Program products to monitor and control, develop designs and virtual models using 2D and 3D CAD software.





How does Kapow Primary help our school to meet statutory guidance for D&T?

Each of our key areas links to the technical knowledge section of the Design and technology National Curriculum *or* reinforces principles learnt through exploring various methods and techniques. From KS1 to KS2, the technical knowledge descriptors build upon prior learning and/or introduce new learning.

	Structures	Mechanisms	Textiles	Electrical systems	Digital world	Cooking and nutrition
EYFS	<p>Explore junk modelling, tinkering with temporary and permanent joins, and a range of materials.</p> <p>Create basic models to test in different conditions.</p>	Explore a simple paper slider mechanism.	Explore and develop threading and weaving skills with different materials and objects.			Explore and become familiar with different fruits and vegetables, using their senses.
KS1	<p>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.</p>	<p>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.</p>	<p>Explore different methods of joining fabrics and experiment to determine the pros and cons of each technique.</p>	<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>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>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	<p>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>	<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 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>

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Design and Technology in the EYFS

The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas.

The table below demonstrates which statements from the Revised 2021 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 and the Development Matters age ranges for Reception to match the programme of study for DT.

The most relevant statements for DT are taken from the following areas of learning: Physical Development and Expressive Arts and Design

DT		
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. Suggested tools: pencils for drawing and writing, paintbrushes, scissors, knives, forks and spoons. • 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.

EYFS Overview :At Birchwood Avenue, we choose aspects of the suggested Kapow units to support the Reception curriculum of learning:

EYFS (Reception)	Unit 1	Unit 2	Unit 3	Unit 4	
	Structures	Food	Textiles	Structures	
	Junk modelling	Soup	Bookmarks	Boats	
	Autumn lesson	Christmas lesson	Spring lesson	Easter lesson	Summer lessons
	Hibernation box	Sliding picture	Flower threading	Hanging decoration	Designing a rainbow salad and Making a rainbow salad

Design and technology in EYFS (reception)

Child-led learning is integral to the Early Years curriculum, and rightly so. Supporting children in following and exploring their own interests allows for a greater depth of learning and understanding and much higher levels of wellbeing and engagement.

Adults in the classroom can model how to use Design and technology to aid children in their pursuits and scaffold the learning so that they can reach a deeper level of understanding.

We know that the difficulty with child-led Design and technology projects often arises when the pupils are not equipped to properly plan their creation or execute their ideas in the way that they wish, sometimes meaning that they will spend a very short amount of time at the workshop or junk modelling area before moving on.

Planning, designing, making and developing skills and knowledge are all fundamental parts of our Design and technology scheme. As you work through our EYFS reception units, children will have plenty of opportunities to get to know each of these areas, as they explore different materials, processes and outcomes.

When pupils are accessing these areas outside of lesson times, it is your job to support and scaffold their learning, offering suggestions or listening to their ideas. Rather than creating artificial learning opportunities during these times of child-led play, instead wait until you observe that a child or group of children have shown a particular interest in a topic. Offer to help them enhance their chosen area of exploration by providing additional resources, demonstrating how to use existing resources or even using the computer.



A spiral curriculum

The scheme of work has been designed as a spiral curriculum with the following key principles in mind:

- ✓ **Cyclical:** Pupils return to the key areas again and again during their time in primary school.
- ✓ **Increasing depth:** Each time a key area is revisited it is covered with greater complexity.
- ✓ **Prior knowledge:** Upon returning to each key area, prior knowledge is utilised so pupils can build upon previous foundations, rather than starting again.



Is there any flexibility in the Kapow Primary Design and technology scheme?

Our Design and technology scheme of work is organised into units of four lessons (or six in EYFS: Reception).

Within each unit, lessons must be taught in order as they build upon each other.

Across a single year group, units themselves do not need to be taught in the suggested order.

The flexibility in the order allows schools to adapt the planning to suit their school and to make use of cross-curricular links available.

The suggested order in these long term plans takes account of the limited resources which may be available in school. Therefore the key strands have been distributed across the year so that all year groups are not requiring the same tools and equipment at the same time.

Yearly Curriculum Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Additional
EYFS							
Year 1		Structures: Constructing windmills		Textiles: Puppets		Cooking and nutrition: Fruit and vegetables	Mechanisms/ Mechanical systems: Making a moving storybook (lesson 1)
Year 2		Mechanisms/ Mechanical systems: Fairground wheel		Structures: Baby bear's chair		Mechanisms/ Mechanical systems: Making a moving monster	Cooking and nutrition: A balanced diet (lesson 1)
Year 3		Digital world: Electronic charm		Cooking and nutrition: Eating seasonally		Structures: Constructing a castle	Textiles: Cross-stitch And applique (lesson 1)
							Mechanical Systems: Pneumatic Toys (lessons 1 and 2)
Year 4		Mechanisms/ Mechanical systems: Making a slingshot car		Structures: Pavilions		Electrical systems: Torches	Cooking and nutrition: Adapting a recipe (lesson 1)
							Textiles: Fastenings (lesson 1)
Year 5		Cooking and nutrition: What could be healthier?		Mechanisms / Mechanical systems: Making a pop-up book		Electrical systems: Doodlers	
Year 6		Textiles: Waistcoats		Structures: Playgrounds		Digital world: Navigating the world	

Progression of Skills and Knowledge

Structures

EYFS (Reception)

Junk modelling

Boats

Skills

Design

- Making verbal plans and material choices.
- Developing a junk model.

- Designing a junk model boat.
- Using knowledge from exploration to inform design.

Make

- Improving fine motor/scissor skills with a variety of materials.
- Joining materials in a variety of ways (temporary and permanent).
- Joining different materials together.
- Describing their junk model, and how they intend to put it together.

- Making a boat that floats and is waterproof, considering material choices.

Evaluate

- Giving a verbal evaluation of their own and others' junk models with adult support.
- Checking to see if their model matches their plan.
- Considering what they would do differently if they were to do it again.
- Describing their favourite and least favourite part of their model.

- Making predictions about, and evaluating different materials to see if they are waterproof.
- Making predictions about, and evaluating existing boats to see which floats best.
- Testing their design and reflecting on what could have been done differently.
- Investigating the how the shapes and structure of a boat affect the way it moves.

Knowledge

Technical

- To know there are a range to different materials that can be used to make a model and that they are all slightly different.
- Making simple suggestions to fix their junk model.

- To know that 'waterproof' materials are those which do not absorb water.

Additional

- To know that some objects float and others sink.
- To know the different parts of a boat.

		Year 1	Year 2
		<u>Constructing a windmill</u>	<u>Baby bear's chair</u>
Skills	Design	<ul style="list-style-type: none"> • Learning the importance of a clear design criteria. • Including individual preferences and requirements in a design. 	<ul style="list-style-type: none"> • Generating and communicating ideas using sketching and modelling. • Learning about different types of structures, found in the natural world and in everyday objects.
	Make	<ul style="list-style-type: none"> • Making stable structures from card, tape and glue. • Learning how to turn 2D nets into 3D structures. • Following instructions to cut and assemble the supporting structure of a windmill. • Making functioning turbines and axles which are assembled into a main supporting structure. 	<ul style="list-style-type: none"> • 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.
	Evaluate	<ul style="list-style-type: none"> • Evaluating a windmill according to the design criteria, testing whether the structure is strong and stable and altering it if it isn't • Suggest points for improvements 	<ul style="list-style-type: none"> • Exploring the features of structures. • Comparing the stability of different shapes. • Testing the strength of own structures. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of own structure.
Knowledge	Technical	<ul style="list-style-type: none"> • To understand that the shape of materials can be changed to improve the strength and stiffness of structures. • To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). • To understand that axles are used in structures and mechanisms to make parts turn in a circle. • To begin to understand that different structures are used for different purposes. • To know that a structure is something that has been made and put together. 	<ul style="list-style-type: none"> • To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily.
	Additional	<ul style="list-style-type: none"> • To know that a client is the person I am designing for. • To know that design criteria is a list of points to ensure the product meets the clients needs and wants. • To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. • To know that windmill turbines use wind to turn and make the machines inside work. • To know that a windmill is a structure with sails that are moved by the wind. • To know the three main parts of a windmill are the turbine, axle and structure. 	<ul style="list-style-type: none"> • To know that natural structures are those found in nature. • To know that man-made structures are those made by people.

		Year 3	Year 4
		<u>Constructing a castle</u>	<u>Pavilions</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. • Designing and/or decorating a castle tower on CAD software. 	<ul style="list-style-type: none"> • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. • Building frame structures designed to support weight.
	Make	<ul style="list-style-type: none"> • Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials. 	<ul style="list-style-type: none"> • Creating a range of different shaped frame structures. • Making a variety of free standing frame structures of different shapes and sizes. • Selecting appropriate materials to build a strong structure and cladding. • Reinforcing corners to strengthen a structure. • Creating a design in accordance with a plan. • Learning to create different textural effects with materials.
	Evaluate	<ul style="list-style-type: none"> • Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. • Suggesting points for modification of the individual designs. 	<ul style="list-style-type: none"> • Evaluating structures made by the class. • Describing what characteristics of a design and construction made it the most effective. • Considering effective and ineffective designs.
Knowledge	Technical	<ul style="list-style-type: none"> • To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. 	<ul style="list-style-type: none"> • To understand what a frame structure is. • To know that a 'free-standing' structure is one which can stand on its own.
	Additional	<ul style="list-style-type: none"> • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack. • To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. • To know that a design specification is a list of success criteria for a product. 	<ul style="list-style-type: none"> • To know that a pavilion is a decorative building or structure for leisure activities. • To know that cladding can be applied to structures for different effects. • To know that aesthetics are how a product looks. • To know that a product's function means its purpose. • To understand that the target audience means the person or group of people a product is designed for. • To know that architects consider light, shadow and patterns when designing.

Year 6	
<u>Playgrounds</u>	
Skills	Design <ul style="list-style-type: none"> • Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs.
	Make <ul style="list-style-type: none"> • Building a range of play apparatus structures drawing upon new and prior knowledge of structures. • Measuring, marking and cutting wood to create a range of structures. • Using a range of materials to reinforce and add decoration to structures.
	Evaluate <ul style="list-style-type: none"> • Improving a design plan based on peer evaluation. • Testing and adapting a design to improve it as it is developed. • Identifying what makes a successful structure.
Knowledge	Technical <ul style="list-style-type: none"> • To know that structures can be strengthened by manipulating materials and shapes.
	Additional <ul style="list-style-type: none"> • To understand what a 'footprint plan' is. • To understand that in the real world, design , can impact users in positive and negative ways. • To know that a prototype is a cheap model to test a design idea.

		Year 2	
		<u>Fairground wheel</u>	<u>Making a moving monster</u>
Skills	Design	<ul style="list-style-type: none"> • Selecting a suitable linkage system to produce the desired motion. • Designing a wheel. 	<ul style="list-style-type: none"> • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria.
	Make	<ul style="list-style-type: none"> • Selecting materials according to their characteristics. • Following a design brief. 	<ul style="list-style-type: none"> • 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.
	Evaluate	<ul style="list-style-type: none"> • Evaluating different designs. • Testing and adapting a design. 	<ul style="list-style-type: none"> • Evaluating own designs against design criteria. • Using peer feedback to modify a final design.
Knowledge	Technical	<ul style="list-style-type: none"> • To know that different materials have different properties and are therefore suitable for different uses. 	<ul style="list-style-type: none"> • To know that mechanisms are a collection of moving parts that work together as a machine to produce movement. • To know that there is always an input and output in a mechanism. • To know that an input is the energy that is used to start something working. • To know that an output is the movement that happens as a result of the input. • To know that a lever is something that turns on a pivot. • To know that a linkage mechanism is made up of a series of levers.
	Additional	<ul style="list-style-type: none"> • To know the features of a ferris wheel include the wheel, frame, pods, a base an axle and an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur. 	<ul style="list-style-type: none"> • To know some real-life objects that contain mechanisms.

		Year 4	Year 5
		<u>Making a slingshot car</u>	<u>Pop up book</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a shape that reduces air resistance. • Drawing a net to create a structure from. • Choosing shapes that increase or decrease speed as a result of air resistance. • Personalising a design. 	<ul style="list-style-type: none"> • Designing a pop-up book which uses a mixture of structures and mechanisms. • Naming each mechanism, input and output accurately. • Storyboarding ideas for a book.
	Make	<ul style="list-style-type: none"> • Measuring, marking, cutting and assembling with increasing accuracy. • Making a model based on a chosen design. 	<ul style="list-style-type: none"> • Following a design brief to make a pop up book, neatly and with focus on accuracy. • Making mechanisms and/or structures using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.
	Evaluate	<ul style="list-style-type: none"> • Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance. 	<ul style="list-style-type: none"> • Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement.
Knowledge	Technical	<ul style="list-style-type: none"> • To understand that all moving things have kinetic energy. • To understand that kinetic energy is the energy that something (object/person) has by being in motion. • To know that air resistance is the level of drag on an object as it is forced through the air. • To understand that the shape of a moving object will affect how it moves due to air resistance. 	<ul style="list-style-type: none"> • To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms.
	Additional	<ul style="list-style-type: none"> • To understand that products change and evolve over time. • To know that aesthetics means how an object or product looks in design and technology. • To know that a template is a stencil you can use to help you draw the same shape accurately. • To know that a birds-eye view means a view from a high angle (as if a bird in flight). • To know that graphics are images which are designed to explain or advertise something. • To know that it is important to assess and evaluate design ideas and models against a list of design criteria. 	<ul style="list-style-type: none"> • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.

Progression of skills and knowledge - Design and technology

Electrical systems (KS2 only)

		Year 4	Year 5
		<u>Torches</u>	<u>Doodlers</u>
Skills	Design	<ul style="list-style-type: none"> Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. 	<ul style="list-style-type: none"> Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product. Developing design criteria based on findings from investigating existing products. Developing design criteria that clarifies the target user.
	Make	<ul style="list-style-type: none"> Making a torch with a working electrical circuit and switch. Using appropriate equipment to cut and attach materials. Assembling a torch according to the design and success criteria. 	<ul style="list-style-type: none"> Altering a product's form and function by tinkering with its configuration. Making a functional series circuit, incorporating a motor. Constructing a product with consideration for the design criteria. Breaking down the construction process into steps so that others can make the product.
	Evaluate	<ul style="list-style-type: none"> Evaluating electrical products. Testing and evaluating the success of a final product. 	<ul style="list-style-type: none"> Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. Determining which parts of a product affect its function and which parts affect its form. Analysing whether changes in configuration positively or negatively affect an existing product. Peer evaluating a set of instructions to build a product.
Knowledge	Technical	<ul style="list-style-type: none"> To understand that electrical conductors are materials which electricity can pass through. To understand that electrical insulators are materials which electricity cannot pass through. To know that a battery contains stored electricity that can be used to power products. To know that an electrical circuit must be complete for electricity to flow. To know that a switch can be used to complete and break an electrical circuit. 	<ul style="list-style-type: none"> To know that series circuits only have one direction for the electricity to flow. To know when there is a break in a series circuit, all components turn off. To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. To know a motorised product is one which uses a motor to function.
	Additional	<ul style="list-style-type: none"> To know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. 	<ul style="list-style-type: none"> To know that product analysis is critiquing the strengths and weaknesses of a product. To know that 'configuration' means how the parts of a product are arranged.

Progression of skills and knowledge - Design and technology

Cooking and nutrition

		Year 1	Year 3
		<u>Fruit and vegetables</u>	<u>Eating seasonally</u>
Skills	Design	<ul style="list-style-type: none"> • Designing smoothie carton packaging by-hand or on ICT software. 	<ul style="list-style-type: none"> • Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.
	Make	<ul style="list-style-type: none"> • Chopping fruit and vegetables safely to make a smoothie. • Identifying if a food is a fruit or a vegetable. • Learning where and how fruits and vegetables grow. 	<ul style="list-style-type: none"> • Knowing how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination. • Following the instructions within a recipe.
	Evaluate	<ul style="list-style-type: none"> • Tasting and evaluating different food combinations. • Describing appearance, smell and taste. • Suggesting information to be included on packaging. 	<ul style="list-style-type: none"> • Establishing and using design criteria to help test and review dishes. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement when making a seasonal tart.
Knowledge	Cooking and nutrition	<ul style="list-style-type: none"> • Understanding the difference between fruits and vegetables. • To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and a vegetable does not. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). 	<ul style="list-style-type: none"> • To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food which has been brought into the country. • To know that exported food is food which has been sent to another country. • To understand that imported foods travel from far away and this can negatively impact the environment. • To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre. • To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health. • To know safety rules for using, storing and cleaning a knife safely. • To know that similar coloured fruits and vegetables often have similar nutritional benefits.

Year 5		
<u>What could be healthier?</u>		
Skills	Design	<ul style="list-style-type: none"> Adapting a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. Writing an amended method for a recipe to incorporate the relevant changes to ingredients. Designing appealing packaging to reflect a recipe.
	Make	<ul style="list-style-type: none"> Cutting and preparing vegetables safely. Using equipment safely, including knives, hot pans and hobs. Knowing how to avoid cross-contamination. Following a step by step method carefully to make a recipe.
	Evaluate	<ul style="list-style-type: none"> Identifying the nutritional differences between different products and recipes. Identifying and describing healthy benefits of food groups.
Knowledge	Cooking and nutrition	<ul style="list-style-type: none"> To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues. To know that I can adapt a recipe to make it healthier by substituting ingredients. To know that I can use a nutritional calculator to see how healthy a food option is. To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.

Progression of skills and knowledge - Design and technology

Textiles

		Year 1	Year 6
		<u>Puppets</u>	<u>Waistcoats</u>
Skills	Design	<ul style="list-style-type: none"> Using a template to create a design for a puppet. 	<ul style="list-style-type: none"> Designing a waistcoat in accordance to a specification linked to set of design criteria. Annotating designs, to explain their decisions.
	Make	<ul style="list-style-type: none"> Cutting fabric neatly with scissors. Using joining methods to decorate a puppet. Sequencing the steps taken during construction. 	<ul style="list-style-type: none"> Using a template when cutting fabric to ensure they achieve the correct shape. Using pins effectively to secure a template to fabric without creases or bulges. Marking and cutting fabric accurately, in accordance with their design. Sewing a strong running stitch, making small, neat stitches and following the edge. Tying strong knots. Decorating a waistcoat, attaching features (such as appliqué) using thread. Finishing the waistcoat with a secure fastening (such as buttons). Learning different decorative stitches. Sewing accurately with evenly spaced, neat stitches.
	Evaluate	<ul style="list-style-type: none"> Reflecting on a finished product, explaining likes and dislikes. 	<ul style="list-style-type: none"> Reflecting on their work continually throughout the design, make and evaluate process.
Knowledge		<ul style="list-style-type: none"> To know that 'joining technique' means connecting two pieces of material together. To know that there are various temporary methods of joining fabric by using staples, glue or pins. To understand that different techniques for joining materials can be used for different purposes. To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. To know that drawing a design idea is useful to see how an idea will look. 	<ul style="list-style-type: none"> To understand that it is important to design clothing with the client/ target customer in mind. To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric. To understand the importance of consistently sized stitches.

		Year 3	Year 6
		<u>Electronic charm</u>	<u>Navigating the world</u>
Skills	Design	<ul style="list-style-type: none"> • Problem solving by suggesting potential features on a Micro: bit and justifying my ideas • Developing design ideas for a technology pouch • Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge 	<ul style="list-style-type: none"> • Writing a design brief from information submitted by a client • Developing design criteria to fulfil the client's request • Considering and suggesting additional functions for my navigation tool • Developing a product idea through annotated sketches • Placing and manoeuvring 3D objects, using CAD • Changing the properties of, or combine one or more 3D objects, using CAD
	Make	<ul style="list-style-type: none"> • Using a template when cutting and assembling the pouch • Following a list of design requirements • Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch • Applying functional features such as using foam to create soft buttons 	<ul style="list-style-type: none"> • Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo) • Explaining material choices and why they were chosen as part of a product concept • Programming an N,E, S,W cardinal compass
	Evaluate	<ul style="list-style-type: none"> • Analysing and evaluating an existing product • Identifying the key features of a pouch 	<ul style="list-style-type: none"> • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool • Developing an awareness of sustainable design • Identifying key industries that utilise 3D CAD modelling and explain why • Describing how the product concept fits the client's request and how it will benefit the customers • Explaining the key functions in my program, including any additions • Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool • Explaining the key functions and features of my navigation tool to the client as part of a product concept pitch • Demonstrating a functional program as part of a product concept
Knowledge	Technical	<ul style="list-style-type: none"> • To understand that in programming a 'loop' is code that repeats something again and again until stopped • To know that a Micro: bit is a pocket-sized, codeable computer • Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm 	<ul style="list-style-type: none"> • To know that accelerometers can detect movement • To understand that sensors can be useful in products as they mean the product can function without human input
	Additional	<ul style="list-style-type: none"> • To know what the 'Digital Revolution' is and features of some of the products that have evolved as a result • To know that in Design and technology the term 'smart' means a programmed product • To know the difference between analogue and digital technologies • To understand what is meant by 'point of sale display' • To know that CAD stands for Computer-aided design 	<ul style="list-style-type: none"> • To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request • To know that 'multifunctional' means an object or product has more than one function • To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing

Design and Technology Curriculum :
Birchwood Avenue Primary School implemented the Kapow scheme of work for Design and Technology in
January 2023.

Autumn 2022 units, or units that cover same key skills covered:

Year 1	Year 2	Year 3	Year 4	Year 5
Mechanisms/ Mechanical systems: Moving stories	Textiles: Christmas Ornaments	Textiles: Cross-stitch And applique	Mechanisms/ Mechanical systems: Making a slingshot car (incomplete)	Structures: Bridges