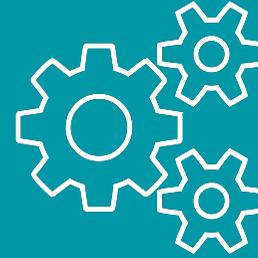


Design and technology



Long-term plan

Standard

Our standard Long-term plan covering the KS1 and KS2 National Curriculum objectives in 5 units a year in KS1 and 6 units a year in KS2.

This document is regularly updated to reflect changes in our content and the most recent version can always be found [here](#).

This version was created on 19.08.22

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The logo for Kapow Primary, featuring the word 'Kapow' in a large, white, stylized font above the word 'Primary' in a smaller, white, sans-serif font, all set against a teal arrow-shaped background pointing to the right.

Kapow
Primary™

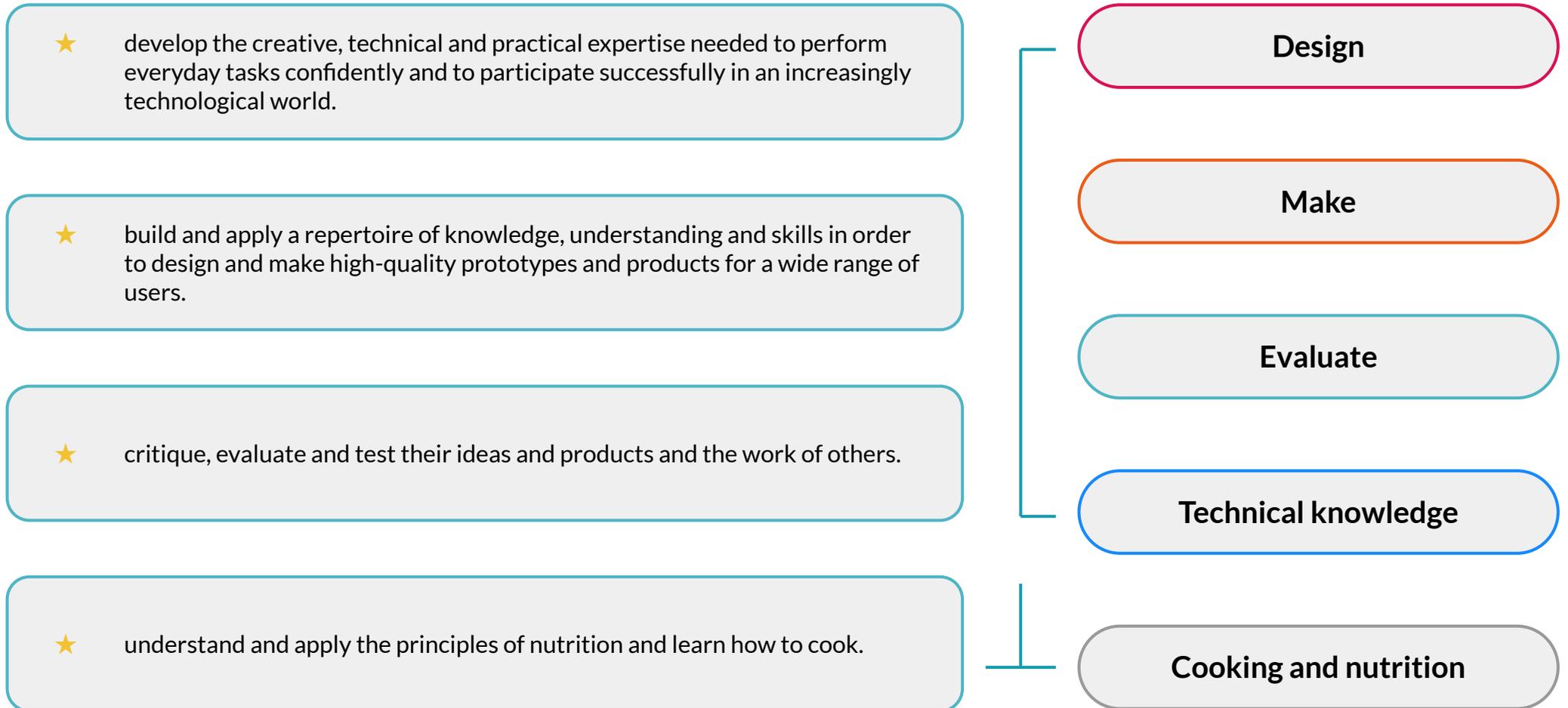
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How does Kapow Primary's scheme of work align with the National Curriculum?

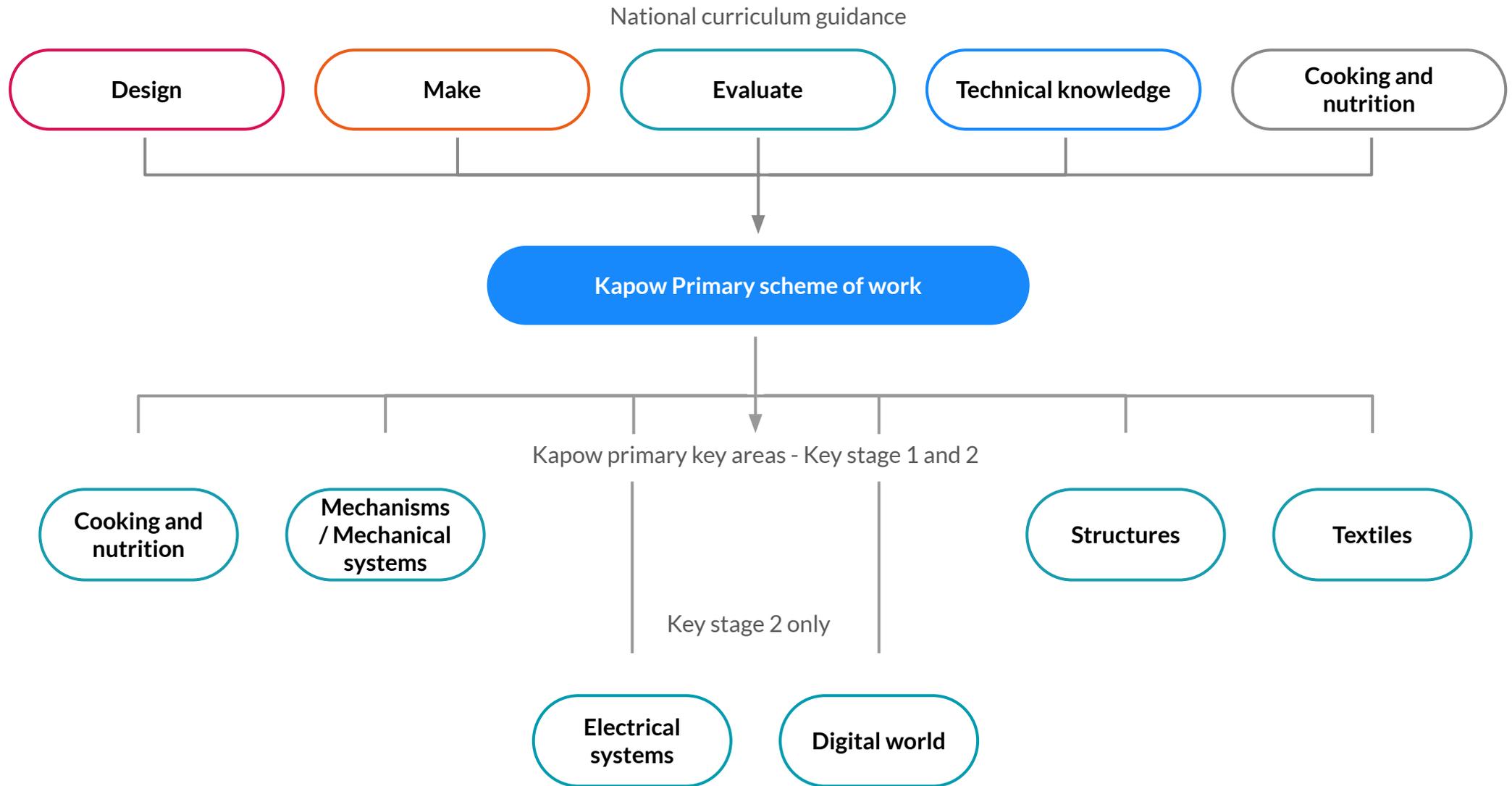
Our scheme of work fulfils the statutory requirements outlined in the **national curriculum (2014)**. The national curriculum Programme of study for Design and technology aims to ensure that all pupils:

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



Our [D&T: National curriculum mapping](#) document shows which of our units cover each of the national curriculum attainment targets as well as each of the five key areas. Each lesson plan references the relevant national curriculum objectives, along with cross-curricular links to any other subjects.

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.

Key Stage 1 and 2

Cooking and nutrition

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.



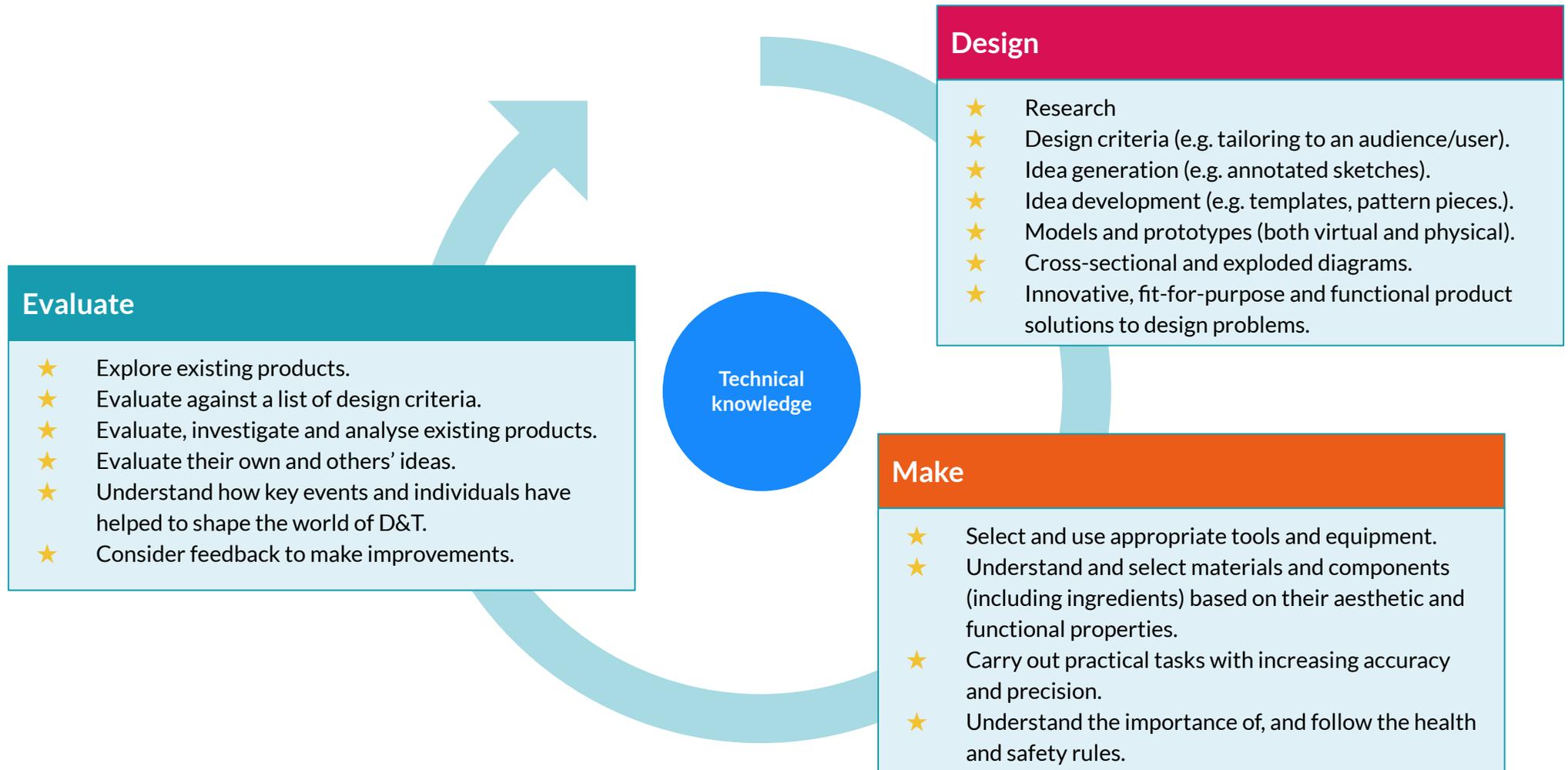
Digital world

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



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.



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.

The units within a year group can be taught in any order. We have considered the limited equipment available in school when creating our suggested order. All units have 4 lessons

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
Year 1	Food	Mechanisms	Structures	Textiles	Mechanisms	<ul style="list-style-type: none"> ★ Celebrate KS1's achievements in D&T, with a gallery of their products. ★ Set an invention challenge with scrap materials. ★ Extra-curricular trips. ★ Overflow time to complete units. 	
	Fruit and vegetables	Making a moving story book	Constructing a windmill	Textiles: Puppets	Wheels and axles		
Year 2	Mechanisms	Food	Mechanisms	Structures	Textiles		
	Fairground wheel	A balanced diet	Making a moving monster	Baby bear's chair	Pouches		
Year 3	Textiles	Electrical systems	Mechanical systems	Digital world	Food		Structures
	Cross-stitch and applique Cushions or Egyptian collars	Electric poster	Pneumatic toys	Electronic charm	Eating seasonally		Constructing a castle
Year 4	Electrical systems	Mechanical systems	Digital world	Food	Structures	Textiles	
	Torches	Making a slingshot car	Mindful moments timer	Adapting a recipe	Pavilions	Fastenings	
Year 5	Mechanical systems	Digital world	Food	Structures	Textiles	Electrical systems	
	Making a pop-up book	Monitoring devices	What could be healthier?	Bridges	Designing a stuffed toy	Doodlers	
Year 6	Digital world	Food	Structures	Textiles	Electrical systems	Mechanical systems	
	Navigating the world	Come dine with me	Playgrounds	Waistcoats	Steady hand game	Automata toys	

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
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.	KS2 only* Create functional electrical products that use series circuits, incorporating different components such as bulbs, LEDs, switches, buzzers and motors. Consider how the materials used in these products can:	KS2 only* 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.	Learn about the basic rules of a healthy and varied diet to create dishes. Understand where food comes from, for example plants and animals.
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.	Mechanical systems 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.	Understand that fabric can be layered for effect, recognising the appearance and technique for different stitch and fastening types, including their: <ul style="list-style-type: none"> • Strength. • Appropriate use. • Design. 	<ul style="list-style-type: none"> • Protect the circuitry. • Reflect light. • Conduct electricity. • Insulate. 	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.	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.

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.

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.

Other useful documentation:

There are a number of essential documents that can support you in planning and approaching our **Design and technology** scheme of work.

- ✓ Progression of skills document:
 - Shows how understanding and application of key knowledge and skills builds year on year.
- ✓ Knowledge organisers
 - Each unit has a knowledge organiser to support pupils in retaining the knowledge covered in the unit.
- ✓ Approaching the new Digital world units to program, monitor and control products
- ✓ Design and technology resource and costings sheet
- ✓ Intent, Implementation, Impact statement
- ✓ Risk assessments

Year 1			
Autumn 1	Food	Autumn 2	Mechanisms
	<p>Fruit and vegetables (4 lessons) Handle and explore fruits and vegetables and learn how to identify which category they fall into, before undertaking taste testing to establish chosen ingredients for a smoothie they will make, with accompanying packaging.</p>		<p>Making a moving story book (4 lessons) Experiment with sliders before planning and making three pages of a moving story book, based on a familiar story, drawing the page backgrounds, creating the moving parts and assembling it.</p>
Spring 1	Structures/ Mechanisms	Spring 2	Textiles
	<p>Constructing a windmill(4 lessons) Design, decorate and build a windmill for a mouse (client) to live in, develop an understanding of different types of windmill, how they work and their key features. Look at real existing examples and the functions that they carry out.</p>		<p>Puppets (4 lessons) Explore different ways of joining fabrics before creating hand puppets based upon characters from a well-known fairytale. Develop technical skills of cutting, glueing, stapling and pinning.</p>
Summer 1	Mechanisms	Summer 2	<ul style="list-style-type: none"> ★ Celebrate KS1's achievements in D&T, with a gallery of their products. Rotate the classes and ask them to provide feedback and ask questions to their peers ★ Set an invention challenge with scrap and recycled materials. Provide the pupils with a variety of textures and joining methods before sharing their ideas ★ Extra-curricular trips. You could plan to take the pupils to see what happens in the world of production, material sourcing, invention and mechanisms ★ As overflow time to complete units where other school events takeover or to provide more time for classes to complete projects
	<p>Wheels and axles (4 lessons) Learn about the main components of a wheeled vehicle. Develop understanding of how wheels, axles and axle holders work; problem-solve why wheels won't rotate; to design and build their own vehicle designs.</p>		

Year 2			
Autumn 1	Mechanisms	Autumn 2	Food
	<p>Fairground wheel (4 lessons) Design and create a functional Ferris wheels, consider how the different components fit together so that the wheels rotate and the structure stands freely. Select appropriate materials and develop their cutting and joining skills.</p>		<p>A balanced diet (4 lessons) Explore and learn what forms a balanced diet, pupils will taste test ingredient combinations from different food groups that will inform a wrap design of their choice which will include a healthy mix of protein, vegetables and dairy.</p>
Spring 1	Mechanisms	Spring 2	Structures
	<p>Making a moving monster (4 lessons) After learning the terms: pivot, lever and linkage, pupils design a monster that will move using a linkage mechanism. Pupils practise making linkages and experiment with various materials to bring their monsters to life.</p>		<p>Baby bear's chair (4 lessons) Using the tale of Goldilocks and the Three Bears as inspiration, pupils help Baby Bear by making him a brand new chair, exploring different shapes and materials. When designing the chair, they consider his needs and what he likes.</p>
Summer 1	Textiles	Summer 2	<ul style="list-style-type: none"> ★ Celebrate KS1's achievements in D&T, with a gallery of their products. Rotate the classes and ask them to provide feedback and ask questions to their peers ★ Set an invention challenge with scrap and recycled materials. Provide the pupils with a variety of textures and joining methods before sharing their ideas ★ Extra-curricular trips. You could plan to take the pupils to see what happens in the world of production, material sourcing, invention and mechanisms ★ As overflow time to complete units where other school events takeover or to provide more time for classes to complete projects
	<p>Pouches (4 lessons) Introduction to sewing. Pupils make their own template, accurately cut their fabric and sew a basic running stitch.</p>		

Year 3			
Autumn 1	Textiles	Autumn 2	Electrical systems
	<p>Cross stitch and appliqué (4 lessons) Cushions or Egyptian collars Introduce two new skills to add to the pupils' repertoire: cross stitch and appliqué. Pupils apply their knowledge to the design, decoration and assembly of their own cushions or Egyptian collars.</p>		<p>Electric poster (4 lessons) An introduction to information design and electrical systems, pupils create an electric poster using a basic circuit to develop a museum display about The Romans.</p>
Spring 1	Mechanical systems	Spring 2	Digital world
	<p>Pneumatic toys (4 lessons) Design and create a toy with a pneumatic system, learning how trapped air can be used to create a product with moving parts. Pupil are introduced to thumbnail sketches and exploded diagrams.</p>		<p>Electronic charm (4 lessons) Design, code, make and promote a Micro:bit electronic charm to use in low-light conditions, developing their understanding of programming to monitor and control products to solve a design scenario.</p>
Summer 1	Food	Summer 2	Structure
	<p>Eating seasonally (4 lessons) Pupils discover when and where fruits and vegetables are grown and learn about seasonality in the UK. They look at the relationship between the colour of fruits and vegetables and their health benefits by making three dishes.</p>		<p>Constructing a castle (4 lessons) Learning about the features of a castle, pupils design and make one of their own. They will also be using configurations of handmade nets and recycled materials to make towers and turrets before constructing a stable base.</p>

Year 4			
Autumn 1	Electrical systems	Autumn 2	Mechanical systems
	<p>Torches (4 lessons) Pupils apply their scientific understanding of electrical circuits to create a torch made from recycled and reclaimed materials and objects. They design and evaluate their product against set design criteria.</p>		<p>Making a slingshot car (4 lessons) Transform lollipop sticks, wheels, dowel and straws into a moving car. Pupils use a glue gun to construct, make the launch mechanism, design and create the chassis of a vehicle using nets.</p>
Spring 1	Digital world	Spring 2	Food
	<p>Mindful moments timer (4 lessons) Design, program, prototype and brand a Micro:bit timer to a specified amount of minutes. Pupils carry out research and existing product analysis to determine how a programmable product could be personalised to their needs.</p>		<p>Adapting a recipe (4 lessons) Work in groups to adapt a simple biscuit recipe, to create the tastiest biscuit ensuring that their creation comes within the given budget of overheads and costs of ingredients.</p>
Summer 1	Structure	Summer 2	Textiles
	<p>Pavilions (4 lessons) Exploring pavilion structures, learning about what they are used for and investigate how to create strong and stable structures before designing and creating their own pavilions, complete with cladding.</p>		<p>Fastenings (4 lessons) Building upon their sewing skills from previous years, pupils design and create a book sleeve; exploring a variety of fastenings and selecting the most appropriate for their design based on strength and appropriate-use.</p>

Year 5			
Autumn 1	Mechanical systems	Autumn 2	Digital world
	<p>Making a pop-up book (4 lessons) Create a four-page pop-up story book design, incorporating a range of functional mechanisms that use levers, sliders, layers and spacers to give the illusion of movement through interaction.</p>		<p>Monitoring devices (4 lessons) Program a Micro: bit animal monitoring device that will alert the owner when the temperature is not optimal. Develop 3D CAD skills by learning how to navigate the Tinkercad interface and essential tools.</p>
Spring 1	Food	Spring 2	Structures
	<p>What could be healthier? (4 lessons) Research and modify a traditional bolognese sauce recipe to make it healthier. Cook improved versions, creating appropriate packaging and learn about where the ingredients the importance of animal welfare when farming cattle.</p>		<p>Bridges (4 lessons) After learning about various types of bridges and exploring how the strength of structures can be affected by the shapes used, create their own bridge and test its durability - using woodworking tools and techniques.</p>
Summer 1	Textiles	Summer 2	Electrical systems
	<p>Stuffed toys (4 lessons) Create a stuffed toy by applying skills learnt in previous units. Introduce blanket stitch.</p>		<p>Doodlers (4 lessons) Explore series circuits further and introduce motors. Explore how the design cycle can be approached at a different starting point, by investigating an existing product, which uses a motor, to encourage pupils to problem-solve and work out how the product has been constructed, ready to develop their own.</p>

Year 6			
Autumn 1	Digital world	Autumn 2	Food
	<p>Navigating the world (5 lessons) <i>Lesson 5 is optional*</i> Program a navigation tool to produce a multifunctional device for trekkers. Combine 3D virtual objects to form a complete product concept in 3D computer-aided design modelling software.</p>		<p>Come dine with me (4 lessons) Research and prepare a three-course meal and taste-test and score their food. Research the journey of their main ingredient from 'farm to fork' or write a favourite recipe.</p>
Spring 1	Structures	Spring 2	Textiles
	<p>Playgrounds (4 lessons) Design and create a model for a new playground featuring five apparatus, made from three different structures. Using a footprint as the base, practise visualising objects in plan view and get creative including natural features.</p>		<p>Waistcoats (4 lessons) Select fabrics, use templates, pin, decorate and stitch materials together to create a waistcoat for a person or purpose of their choosing. Create or use a pattern template to fit a desired person or item (e.g. teddy bear).</p>
Summer 1	Electrical systems	Summer 2	Mechanical systems
	<p>Steady hand game (4 lessons) Design and create a steady hand game, use nets to create the bases and apply knowledge of electrical circuits to build an operational circuit with a buzzer that completes the circuit when the handle makes contact with the wire.</p>		<p>Automata toys (4 lessons) Use woodworking skills, pupils construct an automata; measuring and cutting their materials, assembling the frame, choosing cams and designing the characters that sit on the followers to form an interactive shop display.</p>

This page shows recent updates that have been made to this document.

Date	Update
08.06.22	Y5 <i>Doodlers</i> unit replaces <i>Electronic greetings card</i> unit p. 7 and p. 15
19.08.22	Added new alternative Year 3 Cross stitch and applique theme p.10