Design and technology

Long-term plan

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:

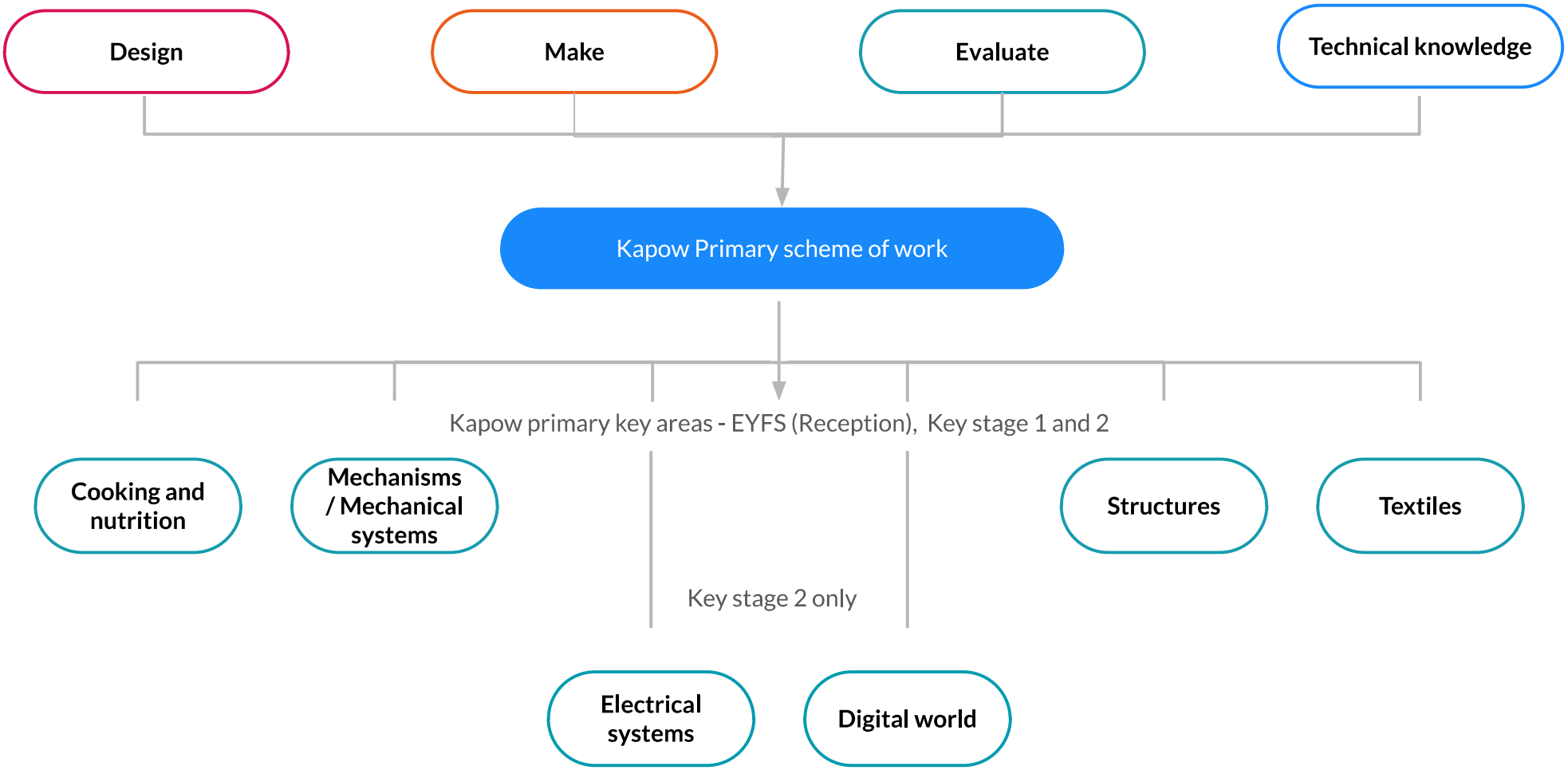
- ★ develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
- ★ build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes 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.
  (*This aim is linked to the four strands, but is primarily met by teaching units from our Cooking and nutrition key area)

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

- **Design**
- **Make**
- **Evaluate**
- **Technical knowledge**

Our D&T: National curriculum coverage document shows which of our units cover each of the National curriculum attainment targets and strands above. Each lesson plan references the relevant National curriculum objectives, along with cross-curricular links to any other subjects. For EYFS (Reception) links are made to Development matters and the Early Learning Goals.

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

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.

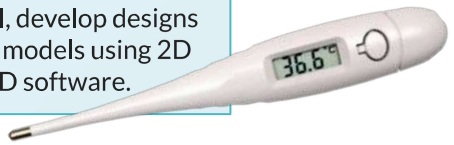
Key Stage 2

Electrical systems

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

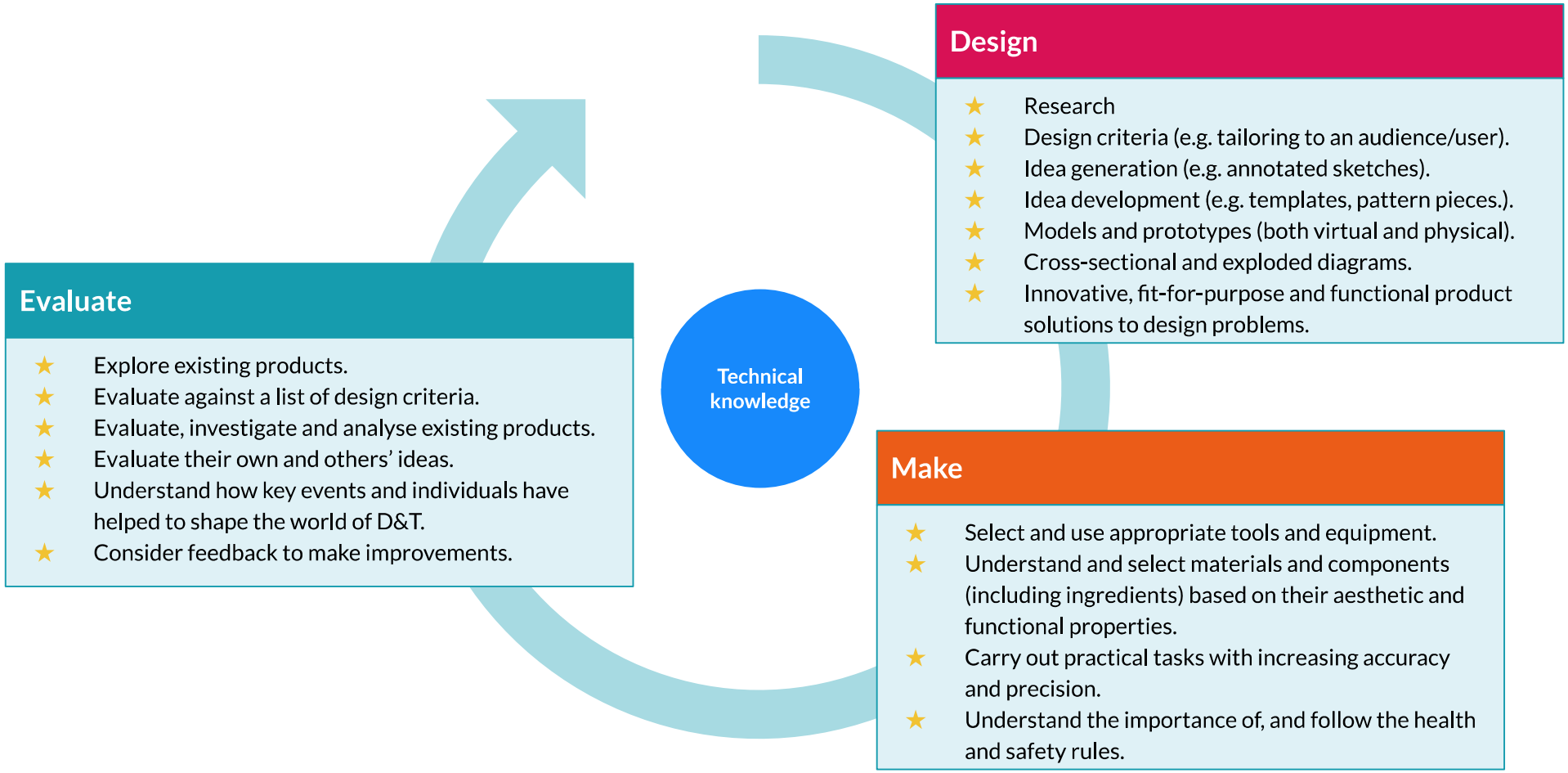
Digital world

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. Cooking and nutrition 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.

Oracy in Design and technology

'Oracy is the ability to speak eloquently, to articulate ideas and thoughts, to influence through talking, to collaborate with peers and to express views confidently and appropriately.

Oracy refers both to the development of speaking and listening skills, and the effective use of spoken language in teaching and learning. It is to speech what literacy is to reading and writing, and numeracy is to Maths.'

Speak for Change: Final report and recommendations from the Oracy All-Party Parliamentary Group Inquiry.

Learning *through* talk

At Kapow Primary, we believe it's crucial to provide pupils with opportunities for exploratory talk during their learning. This involves thinking aloud, questioning, discussing, and collaboratively building ideas.

Learning *to* talk

Similarly, developing oracy skills is essential for pupils to express and articulate themselves effectively across various contexts and settings, including formal ones like public speaking, debates, and interviews.

Through our Design and technology curriculum, pupils have opportunities to develop their oracy skills by:

- Presenting their design ideas or products to audiences of different sizes.
- Explaining designs, preferences or final products.
- Role-playing from the point of view of the user.
- Discussing products and design ideas using new vocabulary.
- Collaborating by organising tasks within a group.
- Critiquing others' designs and products.
- Reflecting on and responding to feedback towards their own designs and products.
- Summarising design ideas.

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 strands again and again during their time in primary school.

✓ **Increasing depth**: Each time the key strand is revisited it is covered with greater complexity.

✓ **Prior knowledge**: Upon returning to each key strand, 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 or six lessons. The scheme is currently being updated so that each unit will have six lessons, starting with the Cooking and nutrition units.

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.

Why have we chosen to include these Design and technology units?

For Design and technology, we had to make some difficult decisions about which units to include and which to omit. We have carefully selected units to ensure gradual progression towards the National curriculum end of key stage attainment targets and to cover all of the four strands shown below in enough detail.

Design | **Make** | **Evaluate** | **Technical knowledge**

Some key areas appear less frequently than others, for example Textiles, and this is deliberate. The National curriculum statements below show that working with textiles is only a small element of the Make strand and many of the making techniques covered in our Textiles units are also covered with a range of materials in other units, such as the use of templates, modelling, measuring and marking out, cutting, shaping and joining.

Make (KS1)	Make (KS2)
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	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

Similarly in Year 2, the coverage of key areas is deliberately imbalanced as there are two Mechanisms units. This is because there is strong progression between the Y1 Structures: Constructing a windmill and the Y2 Mechanisms: Fairground wheel and then again with the Y2 Mechanisms: Making a moving monster. To omit one of these units would negatively impact on the progression.

Long-term plan: Design and technology

Overview (All year groups)

EYFS	Structures: Junk modelling	Textiles: Bookmarks	Structures: Boats
Year 1	Structures: Constructing a windmill	Textiles: simple stitches	Cooking and nutrition: Smoothies
Year 2	Structures: Baby Bear's chair	Mechanisms: Fairground wheel	Mechanisms: Making a moving monster
Year 3	Cooking and nutrition: Eating seasonally	Digital world: Wearable technology	Structures: Constructing a castle
Year 4	Structure: Pavilions	Mechanical systems: Making a slingshot car	Electrical systems: Torches
Year 5	Electrical systems: Doodlers	Mechanical systems: Making a pop-up book	Cooking and nutrition: Developing a recipe
Year 6	Textiles: Bags	Structures: Playgrounds	Digital world: Navigating the world

Long-term plan: Design and technology

Overview - EYFS

EYFS

	Structures: Junk modelling 6 lessons In this unit, pupils explore various junk modelling ideas by learning about different types of permanent and temporary joins. They are encouraged to tinker with a combination of materials and joining techniques in the junk modelling area.		Textiles: Bookmarks 6 lessons Pupils develop and practise threading and weaving techniques using various materials and objects. They look at the history of the bookmark from Victorian times versus modern-day styles. The pupils apply their knowledge and skills to design and sew their own bookmarks.
	Structures: Boats 6 lessons In this unit, children explore what is meant by 'waterproof', 'floating' and 'sinking', then experiment and make predictions with various materials to carry out a series of tests. They learn about the different features of boats and ships before investigating their shape and structures to build their own.		

Long-term plan: Design and technology

Overview - Key stage 1

Year 1

	Structures: Constructing windmills 4 lessons Construct a windmill to complete a request from a user. Develop an understanding of different types of windmill, how they work and their key features. Begin to use technical skills such as making evenly spaced cuts and adding weight to ensure a successful structure.		Textiles: Simple stitches 5 lessons Introducing fabrics as materials made from different types of threads. Pupils learn how to thread a needle and make simple rows of stitches in embroidery fabric, then apply these skills to design and stitch a design onto a piece of bunting.
	Cooking and nutrition: Smoothies 7 lessons Cutting and juicing fruits and vegetables to create a smoothie that meets a design brief, this unit gives the children opportunities to develop food preparation skills with an increased focus on taste testing and ingredient choices.		

Long-term plan: Design and technology

Overview - Key stage 1

Year 2

	Structures: Baby Bear's chair 5 lessons Exploring stability and methods to strengthen structures, the children identify the weaknesses in the Bear's chair and develop an improved solution for him to use.		Mechanisms: Fairground wheel 6 lessons Building a rotating fairground wheel with a free-standing structure, this unit offers a simplified wheel design made from repurposed materials and an additional lesson where children design and conduct a survey to gather opinions.
	Mechanisms: Making a moving monster 5 lessons Explore levers, linkages and pivots through existing products and experimentation, use this research to construct and assemble a moving monster. Example theme: Moving monsters. Alternative theme: Easter – Mechanical animals		

Long-term plan: Design and technology

Overview - Lower key stage 2

Year 3

	Cooking and nutrition: Eating seasonally 7 lessons Learning about seasonal foods and creating a seasonal food tart, this unit provides new lessons with teacher and pupil videos to develop the children's food preparation skills.		Digital world: Wearable technology 7 lessons Designing digital wearable technology and developing a program and housing for a Micro:bit, this unit includes new teacher and pupil videos, with an increased focus on evaluation and the use of a virtual Micro:bit.
	Structures: Constructing a castle 5 lessons Identify and learn about the key features of a castle, before designing and making a recycled-material castle (structure).		

Long-term plan: Design and technology

Overview - Lower key stage 2

Year 4

	Structure: Pavilions 5 lessons Investigating and modelling frame structures, the children explore ways to improve stability, then apply their understanding to design, build and decorate a stable pavilion.		Mechanical systems option 2: Making a slingshot car 4 lessons Transforming lollipop sticks, wheels, dowels and straws into a moving car. Using a glue gun to, making a launch mechanism, designing and making the body of the vehicle using nets and assembling these to the chassis.
	Electrical systems: Torches 5 lessons Identify the difference between electrical and electronic products. Evaluate a range of existing torches and their features, then develop a new functional torch design.		

Long-term plan: Design and technology

Overview - Upper key stage 2

Year 5

	Electrical systems: Doodlers 5 lessons Exploring series circuits and introducing motors, the children investigate an existing motorised product, problem-solve and understand its construction before developing their own.		Mechanical systems: Making a pop-up book 4 lessons Creating a four-page pop-up storybook design incorporating a range of mechanisms and decorative features, including: structures, levers, sliders, layers and spacers.
	Cooking and nutrition: Developing a recipe 7 lessons Learning a simple bolognese recipe and adapting it to improve nutritional content, this unit provides new lessons with teacher and pupil videos to develop the children's food preparation skills.		

Long-term plan: Design and technology

Overview - Upper key stage 2

Year 6

	Textiles: Bags 6 lessons Exploring pattern pieces in textiles, the children investigate how fabric shapes are used to create products while designing and making their own bags.		Structures: Playgrounds 5 lessons Research existing playground equipment and their different forms, before designing and developing a range of apparatus to meet a list of specified design criteria.
	Digital world: Navigating the world 6 lessons Design and program a navigation tool to produce a multifunctional device for trekkers using CAD 3D modelling software. Pitch and explain the product to a guest panel.		