Curriculum

Nightingale Infant & Nursery School

inspire • support • teach

Drayton Community Infant School

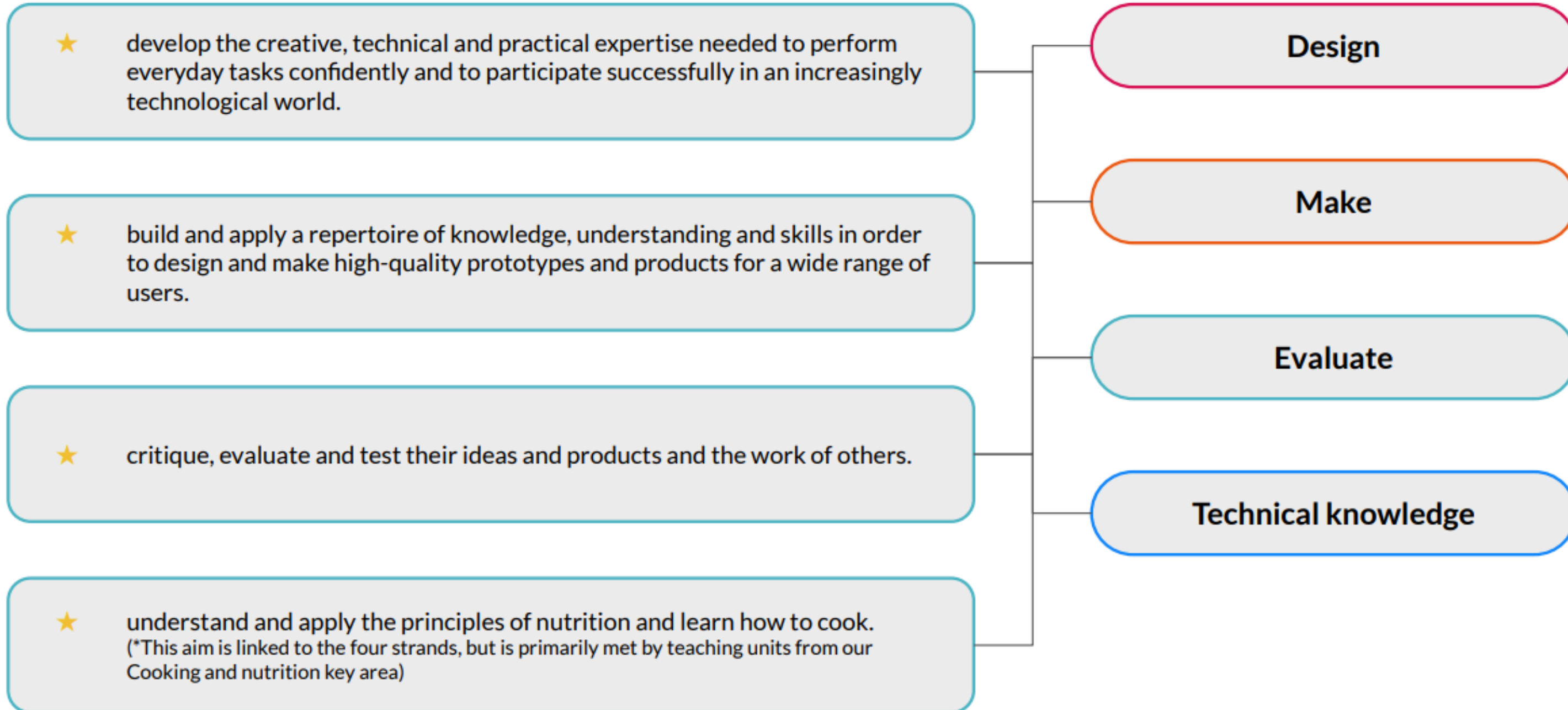inspire • support • teach

Design and Technology

Intent

The Design and technology scheme of work aims 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. Our 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. EYFS (Reception) units provide opportunities for pupils' to work towards the Development matters statements and the Early Learning Goals. Kapow Primary is an Artsmark partner and is able to support schools on their Artsmark journey, inspiring children and young people to create, experience, and participate in great arts and culture.

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 four key strands which run throughout our scheme of work:

★ 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)

Design

Make

Evaluate

Technical knowledge

Our D&T: National curriculum overview 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.

Implementation

The Design and technology National curriculum outlines the three main stages of the design process: design, make and evaluate. 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, with a focus on specific principles, skills and techniques in food, including where food comes from, diet and seasonality. The National curriculum organises the Design and technology attainment targets under four subheadings: Design, Make, Evaluate, and Technical knowledge. We have taken these subheadings to be our Kapow Primary strands:
● Design
● Make
● Evaluate
● Technical knowledge

Cooking and nutrition is given a particular focus in the National curriculum and we have made this one of our four key areas that pupils revisit throughout their time in EYFS and KS1 : ● Cooking and nutrition ● Mechanisms/ Mechanical systems ● Structures ● Textiles

Kapow Primary's Design and technology scheme has a clear progression of skills and knowledge within these strands and key areas across each year group. Our National curriculum overview shows which of our units cover each of the National curriculum attainment targets as well as each of the four strands. Our Progression of skills shows the skills and knowledge that are taught within each year group and how these skills develop to ensure that attainment targets are securely met by the end of each key stage.
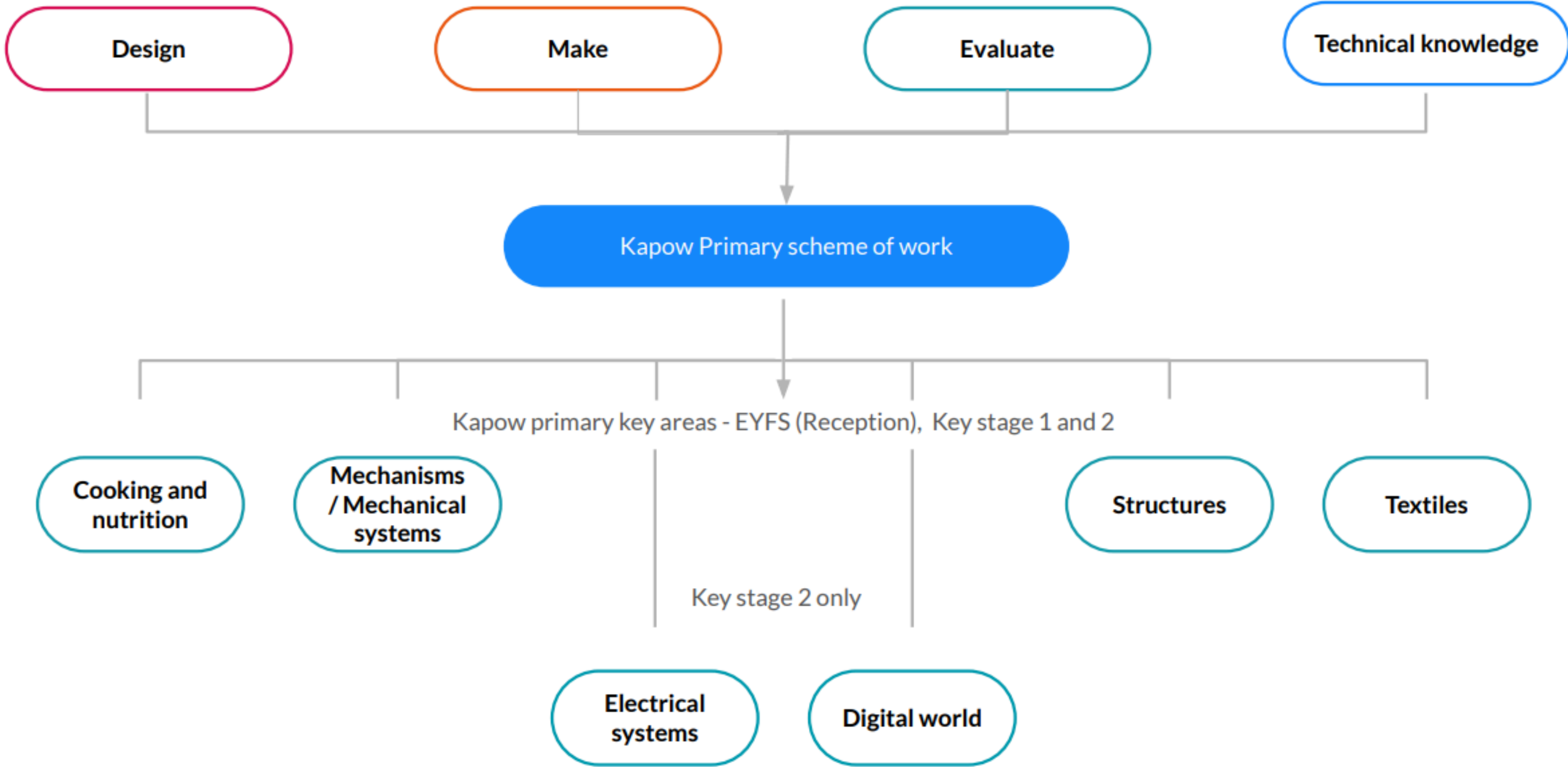
Implementation

Through Kapow Primary's Design and technology scheme, pupils respond to design briefs and scenarios that require consideration of the needs of others, developing their skills in the six key areas. Each of our key areas follows the design process (design, make and evaluate) and has a particular theme and focus from the technical knowledge or cooking and nutrition section of the curriculum. The Kapow Primary scheme is a spiral curriculum, with key areas revisited again and again with increasing complexity, allowing pupils to revisit and build on their previous learning. Lessons incorporate a range of teaching strategies from independent tasks, paired and group work including practical hands-on, computer-based and inventive tasks. This variety means that lessons are engaging and appeal to those with a variety of learning styles. Differentiated guidance is available for every lesson to ensure that lessons can be accessed by all pupils and opportunities to stretch pupils' learning are available when required. Knowledge organisers for each unit support pupils in building a foundation of factual knowledge by encouraging recall of key facts and vocabulary. Strong subject knowledge is vital for staff to be able to deliver a highly effective and robust Design and technology curriculum. Each unit of lessons includes multiple teacher videos to develop subject knowledge and support ongoing CPD. Kapow Primary 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.

Desgin and technology is taught in a block of sessions every half term. In the Autumn term there are two blocks of Design and Technology. We have invested in Kapow Primary to support teacher in there skills and knowledge based teaching of Design and Technology, as from feedback from staff this is what they requested support on, planning and delivering sessions. We are now looing at the resourcing of design and technology across the school.

How is the Design and technology scheme of work organised?

Design

Make

Evaluate

Technical knowledge

Kapow Primary scheme of work

Kapow primary key areas - EYFS (Reception), Key stage 1 and 2

Cooking and nutrition

Mechanisms / Mechanical systems

Structures

Textiles

Key stage 2 only

Electrical systems

Digital world

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.
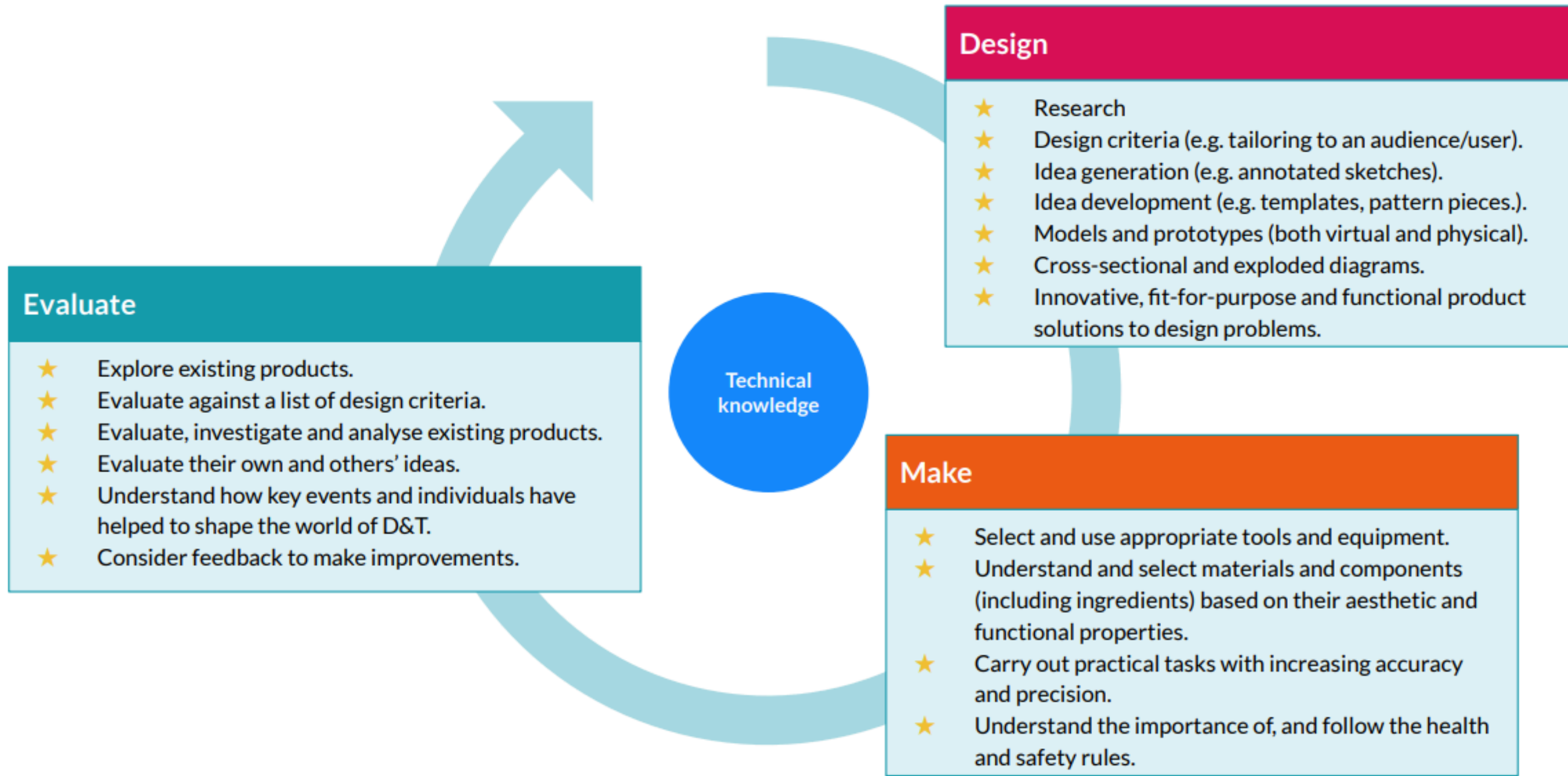
Digital world

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.

Design

★ Research
★ Design criteria (e.g. tailoring to an audience/user).
★ Idea generation (e.g. annotated sketches).
★ Idea development (e.g. templates, pattern pieces.).
★ Models and prototypes (both virtual and physical).
★ Cross-sectional and exploded diagrams.
★ Innovative, fit-for-purpose and functional product solutions to design problems.

Evaluate

★ Explore existing products.
★ Evaluate against a list of design criteria.
★ Evaluate, investigate and analyse existing products.
★ Evaluate their own and others' ideas.
★ Understand how key events and individuals have helped to shape the world of D&T.
★ Consider feedback to make improvements.

Technical knowledge

Make

★ Select and use appropriate tools and equipment.
★ Understand and select materials and components (including ingredients) based on their aesthetic and functional properties.
★ Carry out practical tasks with increasing accuracy and precision.
★ Understand the importance of, and follow the health and safety rules.

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.

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	Explore junk modelling, tinkering with temporary and permanent joins, and a range of materials. Create basic models to test in different conditions.	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	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: • Protect the circuitry. • Reflect light. • Conduct electricity. • Insulate.	**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. 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.	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: • Strength. • Appropriate use. • Design.			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.

Long-term planning- overview

	Year 1	Year 2
Autumn	Mechanisms- leavers and sliders- christmas cards Structures	Mechanisms Structures Textiles- christmas cards themed around artisit
Spring	Textiles	Structures
Summer	Cooking and nutrition	Cooking and nutrition

Long term plan outline- EYFS

Autumn	Structures
Spring	Cooking and nutrition
Summer	Textiles

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.

Design and Technology in EYFS

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 the 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.

Impact

The impact of Kapow Primary's 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, CAD, 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. ➔ Meet the end of key stage expectations outlined in the National curriculum for Computing.