

Design and Technology



Year 6

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.



Key Stage 2

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.



Electrical systems

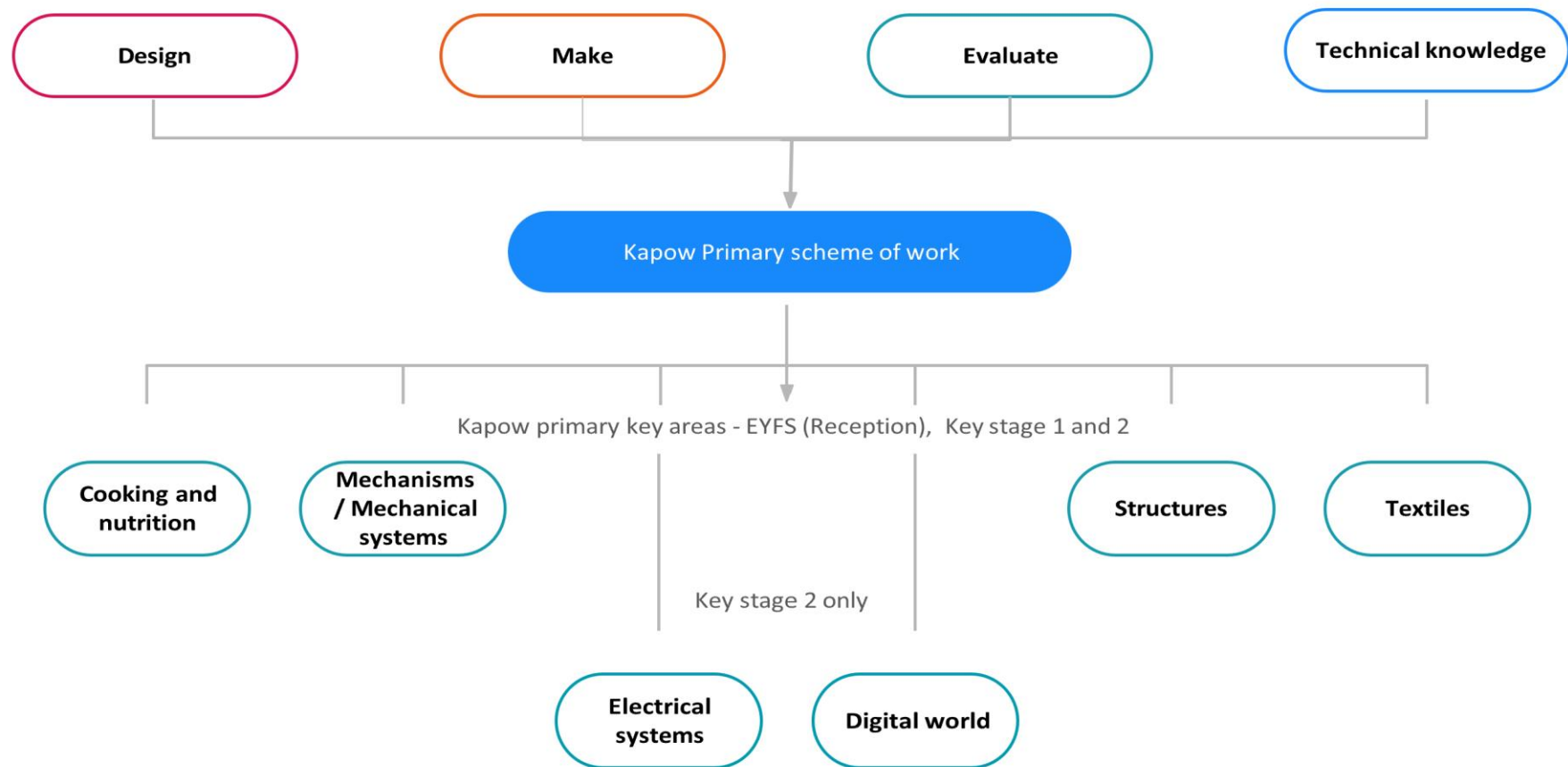
Operational series circuits, circuit components, circuit diagrams and symbols, combined to create various electrical products.



Digital world

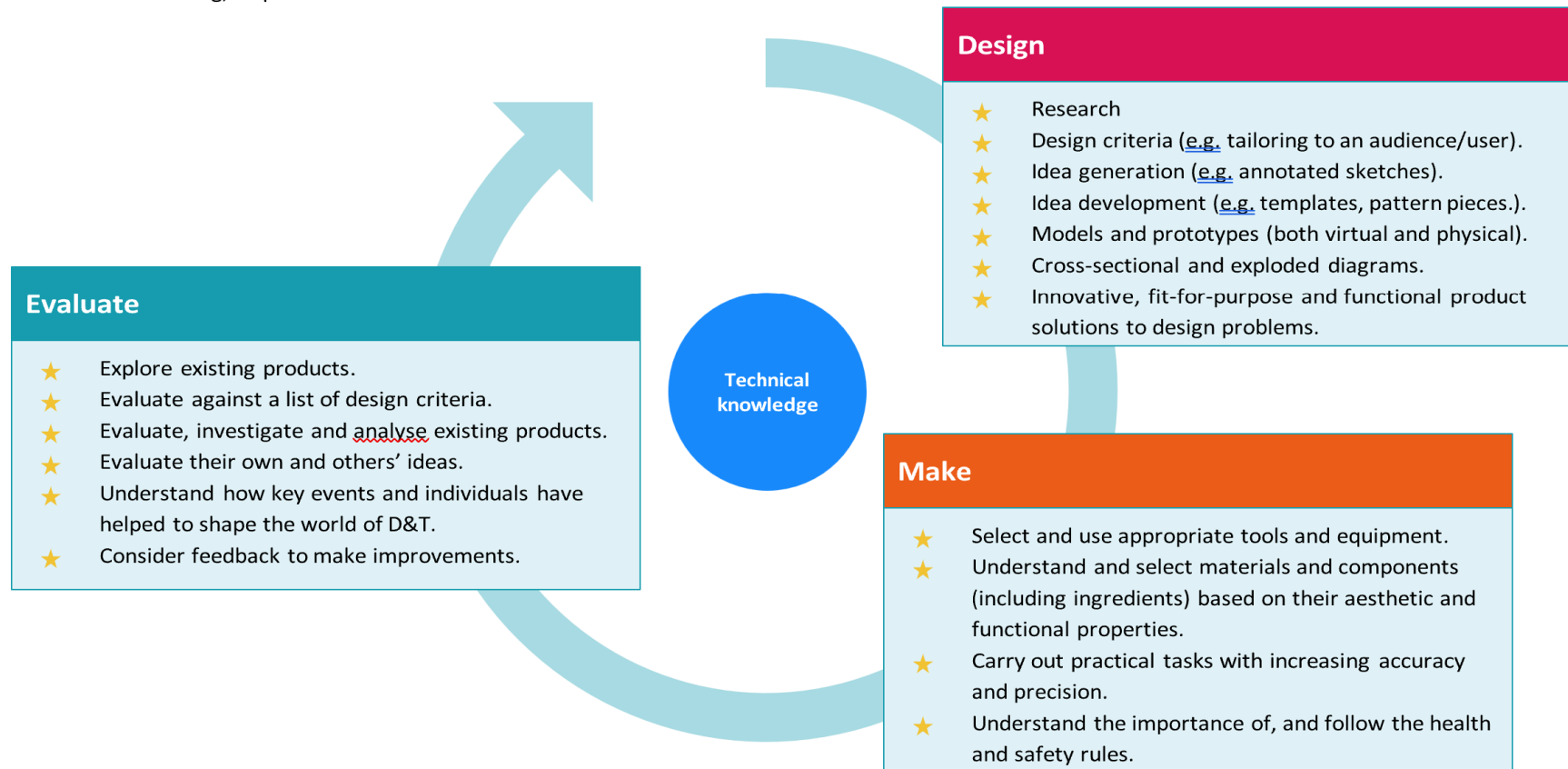
Program products to monitor and control, develop designs and virtual models using 2D and 3D CAD software.





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.



National Curriculum

KS2

Design	Make	Evaluate	Technical Knowledge	Cooking and Nutrition
● Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups ● Generate, develop,	● Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. ● Select from and use a wider range of materials and	● Investigate and analyse a range of existing products ● Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	● Apply their understanding of how to strengthen, stiffen and reinforce more complex structures ● Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]	● . Understand and apply the principles of a healthy and varied diet ● Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques ● Understand seasonality,

model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities	● Understand how key events and individuals in design and technology have helped shape the world	● Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] ● Apply their understanding of computing to program, monitor and control their products.	and know where and how a variety of ingredients are grown, reared, caught and processed.
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Skills Progression

Structure -Playgrounds

Skills	Design	• 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	• 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	• 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	• To know that structures can be strengthened by manipulating materials and shapes.
	Additional	• 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.

Mechanisms / Electrical systems.

Automata toys / Steady hand games

Skills	Design	• Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement. • Understanding how linkages change the direction of a force. • Making things move at the same time. Understanding and drawing cross-sectional diagrams to show the inner-workings of my design.	• Designing a steady hand game - identifying and naming the components required. • Drawing a design from three different perspectives. • Generating ideas through sketching and discussion. • Modelling ideas through prototypes. Understanding the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.
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	Make	• Measuring, marking and checking the accuracy of the jelutong and dowel pieces required. • Measuring, marking and cutting components accurately using a ruler and scissors. • Assembling components accurately to make a stable frame. • Understanding that for the frame to function effectively the components must be cut accurately and the joints of the frame secured at right angles. Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.	• Constructing a stable base for a game. • Accurately cutting, folding and assembling a net. • Decorating the base of the game to a high quality finish. • Making and testing a circuit. Incorporating a circuit into a base
	Evaluate	• Evaluating the work of others and receiving feedback on own work.	• Testing own and others finished games, identifying

		• Applying points of improvement to their toys. Describing changes they would make/do if they were to do the project again.	what went well and making suggestions for improvement. • Gathering images and information about existing children's toys. Analysing a selection of existing children's toys.
Knowledge	Technical	• To understand that the mechanism in an automata uses a system of cams, axles and followers. To understand that different shaped cams produce different outputs.	• To know that batteries contain acid, which can be dangerous if they leak. To know the names of the components in a basic series circuit, including a buzzer.
			To know that 'form' means the shape and appearance of an object. • To know the difference between 'form' and 'function'.

		• To understand that 'fit for purpose' means that a product works how it should and is easy to use. • To know that form over purpose means that a product looks good but does not work very well. • To know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind. To understand the diagram perspectives 'top view', 'side view' and 'back'.
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	Additional	• To know that an automata is a hand powered mechanical toy. • To know that a cross-sectional diagram shows the inner workings of a product. • To understand how to use a bench hook and saw safely. To know that a set square can be used to help mark 90° angles.	
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Cooking and Nutrition

Come dine with me

Skills	Design	● Writing a recipe, explaining the key steps, method and ingredients. ● Including facts and drawings from research undertaken.
	Make	● Following a recipe, including using the correct quantities of each ingredient. ● Adapting a recipe based on research. ● Working to a given timescale. ● Working safely and hygienically with independence
	Evaluate	● Evaluating a recipe, considering: taste, smell, texture and origin of the food group. ● Taste testing and scoring final products. ● Suggesting and writing up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process.

		● Evaluating health and safety in production to minimise cross contamination.
Knowledge	Technical	• To know that 'flavour' is how a food or drink tastes. • To know that many countries have 'national dishes' which are recipes associated with that country. • To know that 'processed food' means food that has been put through multiple changes in a factory. • To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. ● To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).

	Additional	
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Textiles

Waistcoats

Skills	Design	● Designing a waistcoat in accordance to a specification linked to set of design criteria. Annotating designs, to explain their decisions.
	Make	• 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	• Reflecting on their work continually throughout the design, make and evaluate process.
Knowledge	Technical	• 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.

	Additional	
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Digital World

Navigating the world

Skills	Design	• 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 combining one or more 3D objects, using CAD.
	Make	• 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	• 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 explaining 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 pitch.
Knowledge	Technical	• 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	• 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.

All information taken directly from Kapow.