Design and technology

Long-term plan

Long-term plan: Design and technology

Overview (All year groups)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Structures: Junk modelling	Cooking and nutrition: Soup	Textiles: Bookmarks	Structures: Boats	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges
Year 1	Mechanisms: Matching slider game	Structures: Stable structures	Textiles: Simple stitches	Mechanisms: Wheels and axles	Cooking and nutrition: Smoothies	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges
Year 2	Mechanisms: Fairground wheel	Cooking and nutrition: Balanced diet	Mechanisms: Making a moving monster	Structures: A chair for a bear	Textiles: Pouches	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges
Year 3	Textiles: Egyptian collars	Electrical systems: Electric poster	Mechanical systems: Pneumatic toys	Digital world: Wearable technology	Cooking and nutrition: Eating seasonally	Structures: Product packaging
Year 4	Electrical systems: Torches	Mechanical systems: Mechanical cars	Digital world: Mindful moments timer	Cooking and nutrition: Adapting a recipe	Structures: Helmets	Textiles: Fastenings
Year 5	Mechanical systems: Gears and pulleys	Digital world: Monitoring devices	Cooking and nutrition: Developing a recipe	Structure: Bridges	Textiles: Stuffed toys	Electrical systems: Wobble bots
Year 6	Digital world: Navigating the world	Cooking and nutrition: Come dine with me	Structures: Playgrounds	Textiles: Bags	Electrical systems: Steady hand game	Mechanical systems: Automata toys

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Overview - EYFS

EYFS

Autumn 1	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.	**Autumn 2**	Cooking and nutrition: Soup 6 lessons In this unit, children explore the differences between fruits and vegetables using their senses (taste, texture, smell etc.). They listen to the story 'The best pumpkin soup' and discuss the key ingredients the characters used before developing a class-based vegetable soup recipe.
Spring 1	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.	**Spring 2**	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.
Summer 1	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges	**Summer 2**	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges

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Overview - Key stage 1

Year 1

Autumn 1	Mechanisms: Matching slider game 6 lessons Exploring and making slider mechanisms, the children will create a matching game using simple sliders.	**Autumn 2**	Structures: Stable structures 6 lessons Exploring how structures can be made more stable with a wide base and extra weight added to the base, the children will apply these skills in designing and making a stable pencil pot for a Year 1 pupil.
Spring 1	Textiles: Simple stitches 6 lessons Learning how to make simple stitches using a needle and thread, creating a piece of celebratory bunting.	**Spring 2**	Mechanisms: Wheels and axles 6 lessons Exploring how a wheel's shape, smoothness and attachment affect movement, the children learn how to use a wheel, axle and axle holder to create the mechanism for a pull-along toy.
Summer 1	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.	**Summer 2**	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges

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Overview - Key stage 1

Year 2

Autumn 1	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.	**Autumn 2**	Cooking and nutrition: Balanced diet 7 lessons Learning about the importance of a balanced diet and using that knowledge to create a tasty wrap, this unit includes new lessons with both teacher and pupil videos.
Spring 1	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	**Spring 2**	Structures: A chair for a bear 6 lessons Exploring how to strengthen materials, the children will make a strong chair for a bear.
Summer 1	Textiles: Pouches 5 lessons Learn how to sew a running stitch ready to design, make and decorate a pouch using a template.	**Summer 2**	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges

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Overview - Lower key stage 2

Year 3

Autumn 1	Textiles: Egyptian collars 5 lessons Having learnt the basics of sewing and decorating fabric in key stage one, this unit builds on the children's repertoire by introducing two new skills: cross-stitch and appliqué. After learning these techniques, the children apply their knowledge to the design, decoration and assembly of their very own Egyptian Usekh /Wesekh collars to represent their unique personalities.	**Autumn 2**	Electrical systems: Electric poster 5 lessons Introducing information design and developing an electric museum display based on the Romans, this unit strengthens the progression of knowledge and skills across the Electrical systems strand.
Spring 1	Mechanical systems: Pneumatic toys 6 lessons Exploring pneumatic systems, the children will apply their understanding to design and create a pneumatic toy using different types of diagrams.	**Spring 2**	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.
Summer 1	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.	**Summer 2**	Structures: Product packaging 6 lessons Exploring how 3D shell structures are created from nets, investigating their use in packaging and applying this understanding to create original designs.

Suggested long-term plan: Design and technology

Overview - Lower key stage 2

Year 4

Autumn 1	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.	**Autumn 2**	Mechanical systems: Mechanical cars 6 lessons Making and designing mechanical cars that use different methods of movement, this new unit includes new lessons, car designs and teacher and pupil videos.
Spring 1	Digital world: Mindful moments timer 7 lessons Exploring the concept of mindfulness and writing design criteria to develop a programmed product for timing a mindful moment, this unit includes new teacher and pupil videos, with an increased focus on evaluation and the use of a virtual Micro:bit.	**Spring 2**	Cooking and nutrition: Adapting a recipe 7 lessons Adapting an existing biscuit recipe while considering the cost of ingredients and other expenses against a set budget, this unit includes new lessons with teacher and pupil videos to develop the children's food preparation skills and adapt a recipe to suit a target audience.
Summer 1	Structures: Helmets 6 lessons Exploring shell structures, the children investigate how they are strengthened to protect or contain, then apply this knowledge to design and construct their own helmets.	**Summer 2**	Textiles: Fastenings 5 lessons Analyse and evaluate a range of existing fastenings, then devise a list of design criteria to design, generate templates and make a fabric book sleeve.

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Overview - Upper key stage 2

Year 5

Autumn 1	Mechanical systems: Gears and pulleys 6 lessons Exploring the history, mechanics and uses of gears and pulleys, children apply their understanding to make a gear and a pulley system and design an eco-bike that harnesses the energy from an exercise bike to do work.	**Autumn 2**	Digital world: Monitoring devices 5 lessons Applying computing skills to program a Micro:bit animal monitor and using 3D CAD tools in Tinkercad to design a case, housing or stand.
Spring 1	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.	**Spring 2**	Structure: Bridges 5 lessons Testing and analysing different bridges to determine their strength and stability. Exploring material properties and sources, before marking, sawing and assembling a wooden truss bridge.
Summer 1	Textiles: Stuffed toys 5 lessons Designing a stuffed toy and making decisions on materials, decorations and attachments (appendages) after learning how to sew a blanket stitch. Alternative theme: Stuffed Easter eggs.	**Summer 2**	Electrical systems: Wobble bots 6 lessons Investigating how motors can be used in products to create motion, the children use this understanding to design and make a wobble bot for a particular purpose.

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Overview - Upper key stage 2

Year 6

Autumn 1	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.	**Autumn 2**	Cooking and nutrition: Come dine with me 7 lessons Selecting three recipes to create a three-course meal, this unit includes new lessons that explore basic tastes and complementary flavours.
Spring 1	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.	**Spring 2**	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.
Summer 1	Electrical systems: Steady hand game 5 lessons Understand what is meant by fit for purpose design and form follows function. Design and develop a steady hand game using a series circuit, including housing and backboard.	**Summer 2**	Mechanical systems: Automata toys 5 lessons Developing a functional automata window display, this unit offers clearer video instruction, opportunities to interpret exploded diagrams and additional time to explore different cam shapes and make design choices that impact the final product.