

Design and technology

Long-term plan

Mixed-Age

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Suggested long-term plan: Design and technology

Overview (All year groups)

Cycle A	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1/2	Mechanisms: Making a moving storybook	Structures: Stable structures	Textiles: Puppets	Mechanisms: Wheels and axles	Cooking and nutrition: Smoothies	Coming soon! Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges
Year 3/4	Mechanical systems: Pneumatic toys	Digital world: Wearable technology	Electrical systems: Electric poster	Structures: Constructing a castle	Cooking and nutrition: Eating seasonally	Textiles: Cushions
Year 5/6	Textiles: Stuffed toys	Electrical systems: Doodlers	Structure: Bridges	Digital world: Monitoring devices	Cooking and nutrition: Developing a recipe	Mechanical systems: Gears and pulleys
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1/2	Cooking and nutrition: Balanced diet	Mechanisms: Making a moving monster	Structures: Baby Bear's chair	Textiles: Pouches	Mechanisms: Fairground wheel	Coming soon! Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges
Year 3/4	Mechanical systems: Mechanical cars	Digital world: Mindful moments timer	Cooking and nutrition: Adapting a recipe	Structure: Pavilions	Textiles: Fastenings	Electrical systems: Torches
Year 5/6	Textiles: Waistcoats	Electrical systems: Steady hand game	Structures: Playgrounds	Digital world: Navigating the world	Cooking and nutrition: Come dine with me	Mechanical systems: Automata toys

Suggested long-term plan: Design and technology

Overview - Key stage 1

Year 1/2

Unit 1	<u>Mechanisms: Making a moving storybook</u> 4 lessons Investigating how sliders create movement in products by experimenting with simple mechanisms and storybook design. Pupils plan and make a moving story book by drawing backgrounds, creating moving parts and assembling pages based on a familiar story.	Unit 2	<u>Structures: Stable structures</u> 5 lessons Investigating stable shapes and using an understanding of balance to discover how wide or heavy bases improve stability in freestanding structures. Pupils apply their understanding by designing and making a fun, stable pencil pot for a Year 1 pupil.
Unit 3	<u>Textiles: Puppets</u> 4 lessons Recognising the different ways fabrics can be joined while developing skills in cutting, glueing, stapling and pinning. Pupils apply these techniques to design and create hand puppets based on characters from a well-known fairytale.	Unit 4	<u>Mechanisms: Wheels and axles</u> 5 lessons Developing an understanding of how wheels, axles and axle holders work while practising cutting straight and curved shapes with scissors. Pupils problem-solve to improve their wheel designs before designing, building and evaluating a pull-along toy against design criteria.

Unit 5	<u>Cooking and nutrition: Smoothies</u> 6 lessons Examining and taste-testing different fruits and vegetables to identify and compare ingredients. Pupils select ingredients for a smoothie before making their product and designing accompanying packaging.	Unit 6	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges
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Suggested long-term plan: Design and technology

Overview - Lower key stage 2

Year 3/4

Unit 1	<u>Mechanical systems: Pneumatic toys</u> 5 lessons Investigating how compressed air can create movement within a mechanism and be used in a working pneumatic toy. Pupils use different types of diagrams during the design process before designing and building a toy with a moving pneumatic part.	Unit 2	<u>Digital world: Wearable technology</u> 6 lessons Developing an understanding of programmable products by designing, coding and promoting wearable technology for use in low-light conditions. Pupils monitor and control their product to a real-world design scenario.
Unit 3	<u>Electrical systems: Electric poster</u> 4 lessons Exploring information design and simple electrical systems by creating an electronic poster using a basic circuit. Pupils apply their understanding to design and make an interactive museum display about the Romans.	Unit 4	<u>Structures: Constructing a castle</u> 4 lessons Exploring the features and structure of castles through designing and making a model castle. Pupils use handmade nets and recycled materials to create towers and turrets before constructing a stable base for their final structure.

Unit 5	<u>Cooking and nutrition: Eating seasonally</u> 6 lessons Discovering where and when fruit and vegetables are grown by learning about seasonality in the UK. Pupils respond to a brief by designing a seasonal tart using ingredients harvested in the UK during May and June.	Unit 6	<u>Textiles: Cushions</u> 4 lessons Developing sewing and decorative textile skills using cross-stitch and appliqué techniques. Pupils apply their understanding to design, decorate and assemble their own cushion or Egyptian collar using a range of fabrics and stitching methods.
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Suggested long-term plan: Design and technology

Overview - Upper key stage 2

Year 5/6

Unit 1	<u>Textiles: Stuffed toys</u> 4 lessons Developing textile and sewing skills by designing and making a stuffed toy using fabric and decorative techniques. Pupils practise blanket stitch, create fabric details and assemble the components of their finished toy.	Unit 2	<u>Electrical systems: Doodlers</u> 4 lessons Developing an understanding of series circuits by investigating how electrical products are constructed. Pupils explore existing motorised products to problem-solve design features before developing and creating their own.
Unit 3	<u>Structure: Bridges</u> 4 lessons Investigating different types of bridges and how structural strength is affected by shape and design. Pupils apply woodworking tools and techniques to design, build and test the durability of their own bridge structure.	Unit 4	<u>Digital world: Monitoring devices</u> 4 lessons Exploring programmable technology and 3D design by creating a Micro:bit animal monitoring device that responds to temperature changes. Pupils develop CAD skills by learning to use the Tinkercad interface and tools before designing and improving their product.

Unit 5	<u>Cooking and nutrition: Developing a recipe</u> 6 lessons Considering how recipes can be adapted to improve nutritional value by modifying a traditional Bolognese sauce. Pupils cook their improved recipe and design packaging to meet specific design criteria.	Unit 6	<u>Mechanical systems: Gears and pulleys</u> 5 lessons Investigating the history, mechanics and uses of gears and pulleys. Pupils build a gear-and-pulley mechanism before applying their understanding to design an eco-bike.
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Suggested long-term plan: Design and technology

Overview - Key stage 1

Year 1/2

Unit 1	<u>Cooking and nutrition: Balanced diet</u> 6 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.	Unit 2	<u>Mechanisms: Making a moving monster</u> 4 lessons Exploring pivot, lever and linkage mechanisms through designing a moving monster with mechanical parts. Pupils practise making linkages and experiment with different materials to create movement and bring their monster designs to life.
Unit 3	<u>Structures: Baby Bear's chair</u> 4 lessons Exploring shapes and materials through designing and making a chair inspired by the story 'Goldilocks and the Three Bears'. Pupils consider Baby Bear's needs and preferences before selecting suitable materials and constructing a new chair for him.	Unit 4	<u>Textiles: Pouches</u> 4 lessons Developing basic sewing skills by learning how to create templates, cut fabric accurately and sew a running stitch. Pupils apply these techniques to design and make a simple pouch using fabric and hand-stitching methods.

Unit 5	<u>Mechanisms: Fairground wheel</u> 5 lessons Investigating how rotating structures work by researching existing fairground wheels and considering how different components fit together. Pupils select suitable materials and develop cutting and joining skills to design and create a functional fairground wheel that rotates and stands freely.	Unit 6	Use this time to: ★ Extend projects ★ Attend trips ★ Celebrate (gallery) ★ Set challenges
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Suggested long-term plan: Design and technology

Overview - Lower key stage 2

Year 3/4

Unit 1	<u>Mechanical systems: Mechanical cars</u> 5 lessons Exploring mechanical systems by building and testing prototype cars to identify effective design features. Pupils conduct market research, create design criteria and evaluate products from a customer perspective before designing their own mechanical car kit.	Unit 2	<u>Digital world: Mindful moments timer</u> 6 lessons Researching, designing and prototyping a Micro:bit timer. Pupils analyse existing products and apply programming and branding techniques to create a personalised timer that meets user needs.
Unit 3	<u>Cooking and nutrition: Adapting a recipe</u> 6 lessons Adapting a simple biscuit recipe for a chosen target audience. Pupils work collaboratively to select suitable ingredients, manage a budget for overheads and ingredients, and create a biscuit that meets specific design criteria.	Unit 4	<u>Structure: Pavilions</u> 4 lessons Examining pavilion structures and learning how they are designed for strength, stability and purpose. Pupils explore construction techniques before designing and creating their own pavilion, including decorative cladding.

Unit 5	<u>Textiles: Fastenings</u> 4 lessons Designing and creating a book sleeve and exploring a range of fastening techniques. Pupils select the most suitable fastening for their design by considering strength, function and suitability for purpose.	Unit 6	<u>Electrical systems: Torches</u> 4 lessons Applying scientific understanding of electrical circuits through designing and making a torch using recycled and reclaimed materials. Pupils construct and evaluate their product against design criteria to improve its effectiveness and functionality.
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Suggested long-term plan: Design and technology

Overview - Upper key stage 2

Year 5/6

Unit 1	<u>Textiles: Waistcoats</u> 4 lessons Selecting fabrics, using templates and joining materials to create a waistcoat for a chosen person or purpose. Pupils decorate and stitch their designs together while adapting or creating pattern templates to achieve the correct fit.	Unit 2	<u>Electrical systems: Steady hand game</u> 4 lessons Developing knowledge of electrical circuits by designing and creating a steady hand game with an operational buzzer system. Pupils use nets to construct the base before building and testing a circuit that activates when the handle touches the wire.
Unit 3	<u>Structures: Playgrounds</u> 4 lessons Exploring playground design by creating a model that includes five pieces of apparatus made from three different structures. Pupils use a footprint base to develop plan-view drawing skills and incorporate creative natural features into their final design.	Unit 4	<u>Digital world: Navigating the world</u> 5 lessons Programming a navigation tool to produce a multifunctional device for trekkers. Pupils combine 3D virtual objects to form a complete product concept using 3D computer-aided design modelling software.

Unit 5	<u>Cooking and nutrition: Come dine with me</u> 6 lessons Developing food preparation and evaluation skills by researching and preparing a three-course meal. Pupils investigate the journey of a main ingredient from 'farm to fork', taste-test and score their dishes, and write a recipe for a favourite meal.	Unit 6	<u>Mechanical systems: Automata toys</u> 4 lessons Applying woodworking skills by constructing an automaton with moving parts and mechanisms. Pupils measure and cut materials, assemble a frame, select suitable cams and design characters to create an interactive shop display.
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