Design and technology

Long-term plan

Ashton Keynes Primary School

ASHTON KEYNES
Church of England VC Primary School
SHINE BRIGHT ★ REACH FOR THE STARS

Overview (All year groups)

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS						
Year 1	Mechanisms: Matching slider game		Mechanisms: Wheels and axles	Structures: Stable structures	Textiles: Simple stitches	Cooking and nutrition: Smoothies
Year 2	Mechanisms: Fairground wheel		Structures: A chair for a bear	Mechanisms: Levers	Textiles: Pouches	Cooking and nutrition: Balanced diet
Year 3	Textiles: Egyptian collars		Digital world: Wearable technology		Structures: Product packaging	Cooking and nutrition: Eating seasonally
Year 4	Mechanical systems: Mechanical cars		Electrical systems: Exploring electrical products		Digital world: Mindful moments timer	Cooking and nutrition: Adapting a recipe
Year 5		Structures: Bridges		Textiles: Stuffed toys	Digital world: Monitoring devices	Cooking and nutrition: Developing a recipe
Year 6		Mechanical systems: Gears and pulleys		Digital world: Navigating the world	Electrical systems: Steady hand game	Cooking and nutrition: Come dine with me

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Overview - Key stage 1

Year 1

Autumn 1	Mechanisms: Moving picture book Exploring different types of mechanisms used in products, with a focus on how sliding mechanisms create movement. Pupils investigate simple paper sliders before designing and making a book that uses two sliding mechanisms, in both a mock-up and a final product.	**Autumn 2**	
Spring 1	Mechanisms: Wheels and axles 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.	**Spring 2**	Structures: Stable structures 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.
Summer 1	Textiles: Simple stitches Examining fabrics, practising basic sewing techniques and identifying how different materials are made from threads. Pupils learn how to thread a needle and sew simple stitches before designing and creating a piece of decorative bunting.	**Summer 2**	Cooking and nutrition: Smoothies 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.

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Overview - Key stage 1

Year 2

Autumn 1	<u>Mechanisms: Fairground wheel</u> 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.	**Autumn 2**	<u>Structures: A chair for a bear</u> Investigating strong shapes and the properties of stiff and flexible materials by designing a chair inspired by the story 'There's a Bear on My Chair'. Pupils apply their understanding to build a suitable chair for the bear using appropriate materials and construction techniques.
Spring 1	<u>Mechanisms: Levers</u> Investigating different types of levers and how they work in everyday mechanisms. Pupils identify pivots and levers in products before creating their own lever systems and exploring how they make tasks easier.	**Spring 2**	<u>Textiles: Pouches</u> 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.
Summer 1		**Summer 2**	<u>Cooking and nutrition: Balanced diet</u> 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.

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Overview - Lower key stage 2

Year 3

Autumn 1	Textiles: Egyptian collars 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.	**Autumn 2**	
Spring 1	Digital world: Wearable technology Exploring the development of LEDs and how they have enabled a wide range of light-up wearable technologies. Pupils apply their understanding by creating and testing programs to control an array of LEDs before using computer-aided design (CAD) to develop a wearable product.	**Spring 2**	
Summer 1	Structures: Product packaging Exploring how 3D shell structures are created from nets and used in packaging, pupils evaluate what makes good packaging and follow a simple design criteria to create their own.	**Summer 2**	Cooking and nutrition: Eating seasonally 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.

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Overview - Lower key stage 2

Year 4

Autumn 1	<u>Mechanical systems: Mechanical cars</u> 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.	**Autumn 2**	
Spring 1	<u>Electrical systems: Exploring electrical products</u> Investigating electrical components and circuits and how they are used in everyday products to improve safety and convenience. Pupils build simple circuits with switches before designing their own electrical product using a cross-sectional diagram.	**Spring 2**	
Summer 1	<u>Digital world: Mindful moments timer</u> 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.	**Summer 2**	<u>Cooking and nutrition: Adapting a recipe</u> Designing and making biscuits for a chosen target audience by exploring existing products, following recipes and evaluating ingredients, taste and appearance. Pupils develop food preparation skills by adapting a biscuit recipe, creating their own design and evaluating how well their finished product meets the design criteria.

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Overview - Upper key stage 2

Year 5

Autumn 1		**Autumn 2**	<u>Structures: Bridges</u> Learning about different types of bridges and how why they are helpful in different situations. Pupils build models of truss bridges and suspension bridges to investigate strengthening techniques like using triangles and suspension cables.
Spring 1		**Spring 2**	<u>Textiles: Stuffed toys</u> 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.
Summer 1	<u>Digital world: Monitoring devices</u> 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.	**Summer 2**	<u>Cooking and nutrition: Developing a recipe</u> 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.

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Overview - Upper key stage 2

Year 6

Autumn 1		**Autumn 2**	<u>Mechanical systems: Gears and pulleys</u> 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.
Spring 1		**Spring 2**	<u>Digital world: Navigating the world</u> Designing a product and programming it to function as a compass and a pedometer.
Summer 1	<u>Electrical systems: Steady hand game</u> 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.	**Summer 2**	<u>Cooking and nutrition: Come dine with me</u> 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.