

Design and Technology at Minsterley



Intent Statement

- **Aims**

- At Minsterley Primary School we believe that learning is a change to long term memory. We intend to create knowledge through spaced repetition and backwards and forwards learning. Our curriculum is built around repeated opportunities to strengthen key concepts. Opportunities are provided to revisit these skills within different contexts and other curriculum subjects.

The Design and Technology coordinator at
Minsterley Primary is Esther Leonard

The Design and Technology Curriculum

Our school scheme of work is based on a spiralled curriculum where units of work are carefully planned to allow the children to build on previous strands of learning, increased complexity and building on prior knowledge.

Expressive arts and design

EYFS Statutory Educational Programme: The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.



Explore, use and refine a variety of artistic effects to express their ideas and feelings.

Return to and build on their previous learning, refining ideas and developing their ability to represent them.

Create collaboratively, sharing ideas, resources and skills.

What does Design and Technology look like in EYFS?

During continuous provision the children can access a wide range of equipment that will allow them to explore and create using a similar process that they will use once they have moved into KS1. The children can plan, make and verbally share and evaluate their products with peers and adults.

There are tools such as glue, scissors, lolly pop sticks, straws, pipe cleaners, string and junk model resources that they can access independently and safely.

There is also Clix, blocks, gears, Duplo, loose parts (sticks, disks...), marble run, stickle bricks and hammer boards.



The Art and Design Curriculum (KS1 and KS2)

Purpose of study

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

The national curriculum for design and technology aims to ensure that all pupils:

- 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.

Subject content

Key stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

The Art and Design Curriculum (continued...)

Key stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- 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, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

Evaluate

- 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
- understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

- 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 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.

Cooking and nutrition

As part of their work with food, pupils should be taught how to cook and apply the principles of nutrition and healthy eating. Instilling a love of cooking in pupils will also open a door to one of the great expressions of human creativity. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Pupils should be taught to:

Key stage 1

- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

Key stage 2

- 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, and know where and how a variety of ingredients are grown, reared, caught and processed.

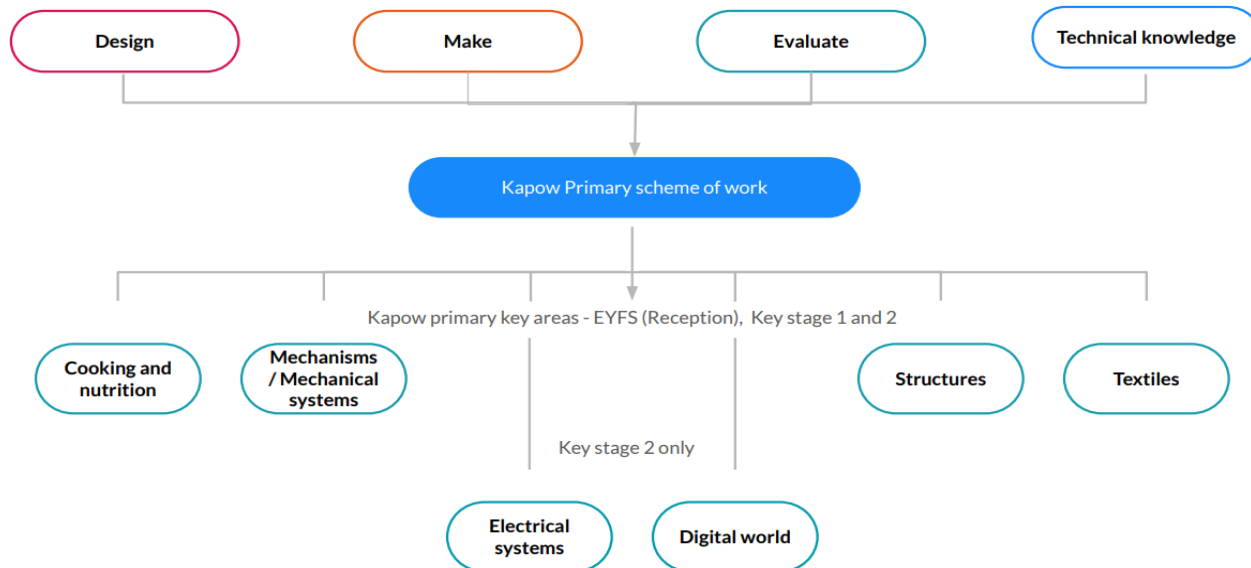
Why Kapow?

This ensures:

- comprehensive subject coverage of the Design and Technology National Curriculum
- consistency across the whole school
- a structured and spiralled approach where children can revisit the five skills within the four identified strands for KS1 (Structures, Textiles, Food and Mechanisms) and six strands for KS2 (the four previously mentioned plus Electrical systems and the Digital world), each time reviewing prior learning through retrieval and increasing their complexity and depth of skill in each.
- that we promote autonomy and creativity.

Four Strands

How is the Design and technology scheme of work organised?



There are four threads which are covered and reviewed in each of the units. There are 4 units to be covered in KS1 and 6 units in KS2.

N.C, five strands and four skills

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:

- ★ 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)

We have identified four key strands which run throughout our scheme of work:

Design

Make

Evaluate

Technical knowledge

Retrieval in Design and Technology-

We endeavour for all children across the school to 'know more, remember more' and we use a variety of retrieval techniques in our Design and Technology lessons.

At present, our retrieval is done through questioning at the beginning of the lesson (True or false, thumbs up thumbs down, can you tell me about...?)

We are introducing a variety of retrieval tasks into books.

Quizzes (kahoot, Google forms)

Kate Jones (Entrance ticket, 3 by 3 grid, Brain dump, multiple choices quizzes,)

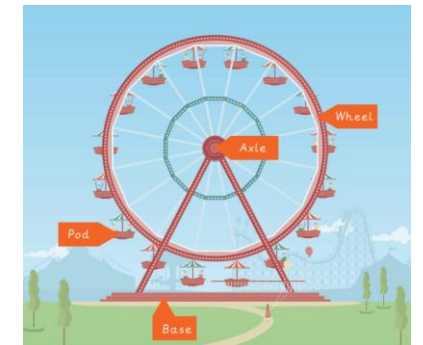
Matching up key words/techniques to meanings.

Label the parts of a wheel

What is a structure? Can you name any?

Odd one out (durable materials, which devise use a thermometer?)

Go for 5- can you name 1 sweet, salty, sour, bitter and umami foods?



Long Term Plans (Structures as an example)

		Year 1	Year 2			Year 3	Year 4
		<u>Constructing a windmill</u>	<u>Baby bear's chair</u>			<u>Constructing a castle</u>	<u>Pavilions</u>
Skills	Design	<ul style="list-style-type: none"> Learning the importance of a clear design criteria Including individual preferences and requirements in a design 	<ul style="list-style-type: none"> Generating and communicating ideas using sketching and modelling. 	Skills	Design	<ul style="list-style-type: none"> Designing a castle with key features to appeal to a specific person/purpose. Drawing and labelling a castle design using 2D shapes, labelling: -the 3D shapes that will create the features - materials needed and colours. Designing and/or decorating a castle tower on CAD software. 	<ul style="list-style-type: none"> Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect. Building frame structures designed to support weight.
	Make	<ul style="list-style-type: none"> Making stable structures from card, tape and glue Learning how to turn 2D nets into 3D structures Following instructions to cut and assemble the supporting structure of a windmill Making functioning turbines and axles which are assembled into a main supporting structure 	<ul style="list-style-type: none"> Making a structure according to design criteria. Creating joints and structures from paper/card and tape. Building a strong and stiff structure by folding paper. 		Make	<ul style="list-style-type: none"> Constructing a range of 3D geometric shapes using nets . Creating special features for individual designs. Making facades from a range of recycled materials. 	<ul style="list-style-type: none"> Creating a range of different shaped frame structures. Making a variety of free standing frame structures of different shapes and sizes. Selecting appropriate materials to build a strong structure and cladding. Reinforcing corners to strengthen a structure. Creating a design in accordance with a plan. Learning to create different textural effects with materials.
	Evaluate		<ul style="list-style-type: none"> Testing the strength of own structure. Identifying the weakest part of a structure. Evaluating the strength, stiffness and stability of own structure. 		<ul style="list-style-type: none"> Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. Suggesting points for modification of the individual designs. 	Evaluate	<ul style="list-style-type: none"> Evaluating structures made by the class. Describing what characteristics of a design and construction made it the most effective. Considering effective and ineffective designs.
Knowledge	Technical	<ul style="list-style-type: none"> To understand that the shape of materials can be changed to improve the strength and stiffness of structures. To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses). To understand that axles are used in structures and mechanisms to make parts turn in a circle. To begin to understand that different structures are used for different purposes. To know that a structure is something that has been made and put together. 	<ul style="list-style-type: none"> To know that materials can be manipulated to improve strength and stiffness. To know that a structure is something which has been formed or made from parts. To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. To know that a 'strong' structure is one which does not break easily. To know that a 'stiff' structure or material is one which does not bend easily. 	Knowledge	Technical	<ul style="list-style-type: none"> To understand that wide and flat based objects are more stable. To understand the importance of strength and stiffness in structures. 	<ul style="list-style-type: none"> To understand what a frame structure is. To know that a 'free-standing' structure is one which can stand on its own.
	Additional	<ul style="list-style-type: none"> To know that a client is the person I am designing for. To know that design criteria is a list of points to ensure the product meets the clients needs and wants. To know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity. To know that windmill turbines use wind to turn and make the machines inside work. To know that a windmill is a structure with sails that are moved by the wind. To know the three main parts of a windmill are the turbine, axle and structure. 	N/A		Additional	<ul style="list-style-type: none"> To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse - and their purpose. To know that a façade is the front of a structure. To understand that a castle needed to be strong and stable to withstand enemy attack. To know that a paper net is a flat 2D shape that can become a 3D shape once assembled. To know that a design specification is a list of success criteria for a product. 	<ul style="list-style-type: none"> To know that a pavilion is a decorative building or structure for leisure activities. To know that cladding can be applied to structures for different effects. To know that aesthetics are how a product looks. To know that a product's function means its purpose. To understand that the target audience means the person or group of people a product is designed for. To know that architects consider light, shadow and patterns when designing.

ALL UNITS ARE 4 WEEKS	Year A			Year B		
	Autumn	Spring	Summer	Autumn	Spring	Summer
Clee	Mechanisms: Making a moving book	Textiles: Puppets	Food: Fruit and Vegetables	Mechanisms: Wheels and axles	Structures: Constructing a windmill	PLAN BEE: Food- Teddy Bears picnic/Seaside snacks
Wrekin	Mechanisms: Making a moving monster	Structures: Baby Bear's Chair	Food: A balanced diet	PLAN BEE: Flying kites (6 lessons) Structure?	Textiles: Pouches	Mechanisms: A Fairground wheel
Lawley	Mechanical systems: Pneumatic toys	Digital world: Electronic charm	Structure: Constructing a castle	Food: Eating seasonally	Textiles: Cushions	Mechanical systems: Making a sling shot car
Stiperstones	Digital world: Mindful moments timer	Electrical systems: Torches	Food: Adapting a recipe	Textiles: Fastenings	Electrical systems: Electric poster	Structures: Pavilions
Longmynd	Structures: Playgrounds	Mechanical systems: Making a pop-up book	Textiles: Stuffed Toys	Electrical systems: Doodlers	Digital world: Navigating the world/Monitoring devices	Food: What could be healthier/Come dine with me.

What does a Design and Technology lesson look like in Minsterley Primary School?

There is an opportunity at the beginning of the lesson for the children to review what was taught in the previous unit.

They are made aware of the learning intention and exposed to key vocabulary and techniques that are relevant for the unit.

The structure of Kapow supports a spiralled approach to enable children to build on their learning from the previous lesson where there will be opportunities to revisit one of more of the four strands.

Through the unit the children will have designed, made and evaluated their product against the agreed criteria.

The children are shown good examples of what they are creating and misconceptions are addressed.

We use key questions to check the children's understanding throughout the lesson.

Structures - Constructing a castle	
2D shapes	Flat objects with 2-dimensions, such as square, rectangle and circle.
3D shapes	Solid objects with 3-dimensions, such as cube, oblong and sphere.
Castle	A type of building that used to be built hundreds of years ago to defend land and be a home for Kings and Queens and other very rich people.
Design criteria	A set of rules to help designers focus their ideas and test the success of them.
Evaluation	When you look at the good and bad points about something, then think about how you could improve it.
Façade	The front of a structure.
Feature	A specific part of something.
Flag	A piece of cloth used as a decoration or to represent a country or symbol.
Net	A 2D flat shape, that can become a 3D shape once assembled.
Recyclable	Material or an object that, when no longer wanted or needed, can be made into something else new.
Scoring	Scratching a line with a sharp object into card to make the card easier to bend.
Stable	Object does not easily topple over.
Strong	It doesn't break easily.
Structure	Something which stands, usually on its own.
Tab	The small tabs on the net template that are bent and glued down to hold the shape together.
Weak	It breaks easily.

Progression in Design and Technology

		Year 4	Year 6
		<u>Adapting a recipe</u>	<u>Come dine with me</u>
Skills	Design	<ul style="list-style-type: none"> • Designing a biscuit within a given budget, drawing upon previous taste testing judgements. 	<ul style="list-style-type: none"> • Writing a recipe, explaining the key steps, method and ingredients. • Including facts and drawings from research undertaken.
	Make	<ul style="list-style-type: none"> • Following a baking recipe, from start to finish, including the preparation of ingredients. • Cooking safely, following basic hygiene rules. • Adapting a recipe to improve it or change it to meet new criteria (e.g. from savoury to sweet). 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Evaluating a recipe, considering: taste, smell, texture and appearance. • Describing the impact of the budget on the selection of ingredients. • Evaluating and comparing a range of food products. • Suggesting modifications to a recipe (e.g. This biscuit has too many raisins, and it is falling apart, so next time I will use less raisins). 	<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • To know that the amount of an ingredient in a recipe is known as the 'quantity'. • To know that it is important to use oven gloves when removing hot food from an oven. • To know the following cooking techniques: sieving, creaming, rubbing method, cooling. • To understand the importance of budgeting while planning ingredients for biscuits. 	<ul style="list-style-type: none"> • 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).

Supporting all pupils to achieve their best.

- Each unit of work caters for all learners.
- There are opportunities to extend and enrich each project for the more able and ways to support those who need it.

- Ways to extend learning-
- That's excellent work, how would you like to develop this work further?
- How could you adapt the design?
- Could you score/cut/attach it here?
- How could you debug this program?
- Could you adapt the recipe so it is suitable for...?

How are all children supported?

Information is chunked so to avoid overload, with key vocabulary emphasised or repeated.

Work is modelled for all students to hear and see the instructions.

Retrieval is key to allow learners to feel ready to receive new information and meaningful links can be made.

Adults 'live mark' and continuously feedback, providing support and guidance to all.

Children have access to iPads and chromebooks if necessary. Videos are also available through Kapow for children to see, hear and understand the tasks involved.

Children are in flexible groupings and partners, this enables children to be supported by their peers and offer supportive and constructive feedback.



Assessment at Minsterley

We use mainly informal assessments to assess Design and Technology. Children are given verbal feedback (live marking) so they can begin to reflect on and assess their own work. This gives the children the opportunities to discuss skills, techniques and colours that have been taught.

Children are also given the opportunities to give feedback to others about their work.

Art Action Plan

TARGET-

To continue to develop the Design and Technology curriculum at Minsterley Primary School by ensure that there is clear progression and coverage across the school.

OUTCOMES-

1. To ensure that subject leaders have a clear insight into their subject and how it is taught across school currently so that they can plan next steps.
2. To ensure that resources available across school are available for the Design and Technology curriculum so that teachers are able to plan effectively to the best of their ability.
3. To identify key resources to support mechanisms.

Art Monitoring at Minsterley

Design and Technology books are monitored by the co-ordinator & Headteacher

Pupil voice carried out by co-ordinator

Time given during staff meetings to discuss feedback of Pupil voice and book look.

Time given during staff meetings to discuss feedback of Pupil voice and book look.

Design and Technology Policy reviewed Oct 2022 (staff server/website)

Resources list (saved on server/speak to coordinator or head for future purchases)

Share Powerpoint with staff and Governors

Subject leader attends all updates