



Curriculum Handbook
Key Stage 1 and Key Stage 2
Design and Technology

Curriculum Statement

Intent

At Eynsham Community Primary School, we intend to build an exciting, inspiring and practical Design and Technology curriculum that encourages all pupils to use their creativity and imagination. In particular, children will design and make products that solve real and relevant problems within a variety of contexts, as well as consider their own and others' needs, wants and values.

At Eynsham Community Primary School, our Design and Technology curriculum builds upon children's prior learning through our progression documents and the use of Knowledge Concept and Vocabulary Organisers (KCVs). To support teachers to deliver a broad and exciting curriculum, we use the scheme 'Kapow' to develop a set of well structured and sequenced lessons that deliver the aims of the National Curriculum.

A high quality Design and Technology lesson should engage, inspire and

challenge pupils, equipping them with the knowledge and skills to experiment, design and create their own pieces of work. As children progress through the small steps of learning, mapped out with the specific learning objectives, they should be able to think critically and develop a mastered understanding of Design and Technology.

In addition, throughout each lesson, the children not only develop their interest and curiosity about Design and Technology, they also develop their emotional resilience and expression to further enhance their personal, social and emotional development.



Implementation

The teaching and implementation of Design and Technology is based on the National Curriculum objectives which are mapped out by 'Kapow'.

Delivered weekly, Design and Technology lessons follow the school's approach to the Rosenshine's Principles where content is regularly revisited and skills and knowledge built upon.

The learning outcomes are organised into different strands: Structures, Cooking and Nutrition, Electrical Systems and Mechanical Systems. The children will experience at least one of these units across the Key Stage.

At the beginning of each unit, the children are introduced to a new KCV that provides an overview of the key learning, vocabulary and skills the children will be exposed to in order to achieve the end of unit outcomes.

The overview of each KCV provides the Teachers and Teaching Assistants with the

required subject knowledge to deliver high quality lessons, as well as highlighting how each lesson is sequenced to achieve the final learning outcomes. The Kapow scheme is a helpful tool to support staff in feeling secure with the delivery of Design and Technology lessons.



Impact

Firstly, we want all children to understand that when they learn at Eynsham, they should all consider themselves Design Technicians.

Secondly, we want all children at Eynsham to understand that Design and Technology comes in a range of forms that include: Structures, Cooking and Nutrition, Electrical Systems and Mechanical Systems; they begin to differentiate between these different strands as they move through the school and have an understanding that Design and Technology is not the same as Art.

Finally, as a result of the development of Design and Technology, it allows children to develop their problem solving and social skills which help to build resilience within the classroom.

Assessment

To assess Design and Technology at Eynsham, teachers determine whether the children have achieved the learning intentions mapped out in the KCV of each topic. Teachers then analyse how the children have applied these skills to their final piece of Design and Technology work.

In addition, *Kapow* has mapped out a clear and concise document that provides a range of examples of children's work that is graded as either 'below age expectations,' 'at age related expectations' and 'greater depth'. These examples can be seen for each lesson/skill and aims to assist teacher assessment.

Children are also encouraged to examine their own work and the work of others using peer assessment.

Inclusion

Design and Technology at Eynsham is for everyone. To help promote inclusivity, the

curriculum has been designed to deliver a range of Design and Technology lessons that can be accessed by all. Pupils will be given the opportunity to use a range of tools throughout each topic to achieve the learning intentions - no matter their need. Lessons will be adapted and altered to enable all children to access each learning opportunity. Furthermore, the range of units provided by our curriculum will encourage all children to engage with Design and Technology.

Here at Eynsham, all Design and Technology lessons ensure every child has an equal chance of learning, regardless of whether they might have a disability or a special need. The ethos generated around our lessons develop and boost everyone's self confidence to accept themselves as Design Technicians and their strengths and weaknesses.



Cultural Capital

Our school aims to engage all pupils in Design and Technology. When completing studies of existing Design Technicians, the children will be exposed to a range of people from different genders, social and

educational backgrounds, ages and experience. These will include people from our local community and also those from other countries. A wide range of techniques and materials will be used to ensure

children from all backgrounds have exciting opportunities which they may not have access to outside of the school environment.



Curriculum Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1		Structures: Constructing Windmills		Textiles: Puppets		Cooking and Nutrition: Fruit and Vegetables.
Year 2		Structures: Baby bear's chair.		Mechanisms: Fairground wheel		Mechanisms: Making a moving monster.
Year 3		Cooking and Nutrition: Eating Seasonally		Digital World: Electronic charm		Structures: Constructing a castle
Year 4		Structures: Pavilions.		Mechanical Systems: Making a slingshot car.		Electrical Systems: Torches
Year 5		Electrical Systems: Doodlers		Mechanical Systems: Making a pop-up book.		Cooking and Nutrition: What could be healthier?
Year 6		Textiles: Waistcoats		Structures: Playgrounds		Digital World: Navigating the world

Skills Progression

Structures						
Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils should be taught to:</p> <p>Return to and build on their previous learning, refining ideas and developing their ability to represent them.</p> <p>ELG: Creating with materials. Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p>	<p>Pupils should be taught to:</p> <p>Learning the importance of a clear design criteria.</p> <p>Including individual preferences and requirements in a design.</p> <p>Making stable structures from card, tape and glue.</p> <p>Learning how to turn 2D nets into 3D structures.</p> <p>Following instructions to cut and assemble the Supporting structure of a windmill.</p> <p>Making functioning turbines and axles which are assembled into a main supporting structure.</p>	<p>Pupils should be taught to:</p> <p>Generating and communicating ideas using sketching and modeling.</p> <p>Learning about different types of structures, found in the natural world and in everyday objects.</p> <p>Making a structure according to design criteria.</p> <p>Creating joints and structures from paper/card and tape.</p> <p>Building a strong and stiff structure by folding paper.</p> <p>Exploring the features of structures.</p> <p>Comparing the stability of different shapes.</p> <p>Testing the strength of their own structures.</p> <p>Identifying the weakest part of a structure.</p> <p>Evaluating the strength, stiffness and stability of their own structure.</p>	<p>Pupils should be taught to:</p> <p>Designing a castle with key features to appeal to a specific person/purpose.</p> <p>Drawing and labeling a castle design using 2D shapes.</p> <p>Designing and/or decorating a castle tower on CAD software.</p> <p>Constructing a range of 3D geometric shapes using nets.</p> <p>Creating special features for individual designs.</p> <p>Making facades from a range of recycled materials.</p> <p>Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design.</p> <p>Suggesting points for modification of the individual designs.</p>	<p>Pupils should be taught to:</p> <p>Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect.</p> <p>Building frame structures designed to support weight.</p> <p>Creating a range of different shaped frame structures.</p> <p>Making a variety of free-standing frame structures of different shapes and sizes.</p> <p>Selecting appropriate materials to build a strong structure and for the cladding.</p> <p>Reinforcing corners to strengthen a structure.</p> <p>Creating a design in accordance with a plan.</p> <p>Learning to create different textural effects with materials.</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <p>Designing a playground featuring a variety of different structures, giving consideration to how the structures will be used.</p> <p>Considering effective and ineffective designs.</p> <p>Building a range of play apparatus structures drawing upon new and prior knowledge of structures.</p> <p>Measuring, marking and cutting wood to create a range of structures.</p> <p>Using a range of materials to reinforce and add decoration to structures.</p> <p>Improving a design plan based on peer evaluation.</p> <p>Testing and adapting a design to improve it as it is developed.</p> <p>Identifying what makes a successful structure.</p>

Textiles

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils should be taught to:</p> <p>Explore, use and refine a variety of artistic effects to express their ideas and feelings. ELG: Creating with materials:</p> <p>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>ELG: Creating with materials:</p> <p>Share their Creations, explaining the process they have used.</p>	<p>Pupils should be taught to:</p> <p>Using a template to create a design for a puppet. Cutting fabric neatly with scissors.</p> <p>Using joining methods to decorate a puppet.</p> <p>Sequencing steps for construction.</p> <p>Reflecting on a finished product, explaining likes and dislikes.</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <p>Designing a waistcoat in accordance with a specification and design criteria to fit a specific theme.</p> <p>Annotating designs.</p> <p>Using a template when pinning panels onto fabric.</p> <p>Marking and cutting fabric accurately, in accordance with a design.</p> <p>Sewing a strong running stitch, making small, neat stitches and following the edge.</p> <p>Tying strong knots.</p> <p>Decorating a waistcoat – attaching objects using thread and adding a secure fastening.</p> <p>Learning different Decorative stitches.</p> <p>Sewing accurately with even regularity of stitches.</p>

Cooking and Nutrition

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils should be taught to:</p> <p>ELG: Speaking: Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.</p> <p>Know and talk about the different factors that support their overall health and wellbeing: healthy eating.</p> <p>ELG: Managing self: Manage their own basic hygiene and personal needs, including understanding the importance of healthy food choices</p> <p>Explore, use and refine a variety of artistic effects to express ideas and feelings.</p> <p>ELG: Creating with materials: Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p>	<p>Pupils should be taught to:</p> <p>Designing smoothie carton packaging by-hand or on ICT software.</p> <p>Chopping fruit and vegetables safely to make a smoothie. Identifying if a food is a fruit or a vegetable.</p> <p>Learning where and how fruits and vegetables grow. Tasting and evaluating different food combinations.</p> <p>Describing appearance, smell and taste.</p> <p>Suggesting information to be included on packaging.</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <p>Following the instructions within a recipe.</p> <p>Establishing and using design criteria to help test and review dishes.</p> <p>Describing the benefits of seasonal fruits and vegetables and the impact on the environment.</p> <p>Suggesting points for improvement when making a seasonal tart.</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <p>Adapting a traditional Recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.</p> <p>Writing an amended method for a recipe to incorporate the relevant changes to ingredients.</p> <p>Designing appealing packaging to reflect a recipe.</p> <p>Cutting and preparing recipes safely.</p> <p>Using equipment safely, including knives, hot pans and hobs. Knowing how to avoid cross-contamination.</p> <p>Following a step-by- step method carefully to make a recipe.</p>	<p>Pupils should be taught to:</p>

Mechanism

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <p>Selecting a suitable linkage system to produce the desired motions.</p> <p>Designing a wheel.</p> <p>Selecting appropriate materials based on their properties.</p> <p>Selecting materials according to Their characteristics.</p> <p>Following a design brief.</p> <p>Evaluating different designs.</p> <p>Testing and adapting a design.</p> <p>Selecting a suitable linkage system to produce the desired motions.</p> <p>Designing a wheel.</p> <p>Selecting appropriate materials based on their properties.</p> <p>Selecting materials according to Their characteristics.</p> <p>Following a design brief.</p> <p>Evaluating different designs.</p> <p>Testing and adapting a design.</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <p>Designing a shape that reduces air resistance.</p> <p>Drawing a net to create a structure from.</p> <p>Choosing shapes that increase or decrease speed as a result of air resistance.</p> <p>Personalising a design.</p> <p>Measuring, marking, cutting and assembling with increasing accuracy.</p> <p>Making a model based on a chosen design.</p> <p>Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.</p>	<p>Pupils should be taught to:</p> <p>Developing design criteria based on findings from investigating existing products.</p> <p>Developing design criteria that clarifies the target user.</p> <p>Altering a product's form and function by tinkering with its configuration.</p> <p>Making a functional series Circuit, incorporating a motor.</p> <p>Constructing a product with consideration for the design criteria.</p> <p>Breaking down the construction process into steps so that others can make the product.</p> <p>Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses.</p>	<p>Pupils should be taught to:</p>

Digital World

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Pupils should be taught to:	Pupils should be taught to:	Pupils should be taught to:	<p>Pupils should be taught to:</p> <p>Problem solving by suggesting potential features on a Micro:bit and justifying my ideas.</p> <p>Developing design ideas for a technology pouch.</p> <p>Drawing and manipulating 2D shapes, using computer-aided design, to produce a point of sale badge.</p> <p>Using a template when cutting and assembling the pouch.</p> <p>Following a list of design requirements. Selecting and using the appropriate tools and equipment for cutting, joining, shaping and decorating a foam pouch.</p> <p>Applying functional features such as using foam to create soft buttons.</p> <p>Analysing and evaluating an existing product. Identifying the key features of a pouch.</p>	Pupils should be taught to:	Pupils should be taught to:	<p>Pupils should be taught to:</p> <p>Writing a design brief from information submitted by a client.</p> <p>Developing design criteria to fulfill the client's request.</p> <p>Developing a product idea through annotated sketches.</p> <p>Placing and maneuvering 3D objects, using CAD. Changing the properties of, or combine one or more 3D objects, using CAD.</p> <p>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.</p>

Electrical Systems

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <p>Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.</p> <p>Making a torch with a working electrical circuit and switch.</p> <p>Using appropriate equipment to cut and attach materials.</p> <p>Assembling a torch according to the design and success criteria.</p> <p>Evaluating electrical products.</p> <p>Testing and evaluating the success of a final product.</p>	<p>Pupils should be taught to:</p> <p>Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.</p> <p>Developing design criteria based on findings from investigating existing products.</p> <p>Developing design criteria that clarifies the target user.</p> <p>Altering a product's form and function by tinkering with its configuration.</p> <p>Making a functional series Circuit, incorporating a motor.</p> <p>Constructing a product with consideration for the design criteria. Breaking down the construction process into steps so that others can make the product. Carry out product analysis to look at the purpose of a product along with its strengths and weaknesses.</p>	<p>Pupils should be taught to:</p>

Key Knowledge of Design and Technology

Year 1

By the end of the year children will have gained the following knowledge and skills:

Structures: Constructing a Windmill

Key Knowledge:

- 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 (and, therefore, they are 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.

Textiles: Puppets

Key Knowledge:

- To know that 'joining technique' means connecting two pieces of material together.
- To know that there are various temporary methods of joining fabric by using staples, glue or pins.
- To understand that different techniques for joining materials can be used for different purposes.
- To understand that a template (or fabric pattern) is used to cut out the same shape multiple times.
- To know that drawing a design idea is useful to see how an idea will look.

Cooking and Nutrition: Fruit and Vegetables

Key Knowledge:

- To understand the difference between fruits and vegetables.
- To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).
- To know that a blender is a machine which mixes ingredients together into a smooth liquid.
- To know that a fruit has seeds and a vegetable does not.
- To know that fruits grow on trees or vines.
- To know that vegetables can grow either above or below ground.
- To know that vegetables can come from different parts of the plant.

Key Knowledge of Design and Technology

Year 2

By the end of the year children will have gained the following knowledge and skills:

Structures: Baby bear's chair

Key Knowledge:

Generating and communicating ideas using sketching and modelling.

Learning about different types of structures, found in the natural world and in everyday objects.

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.

Exploring the features of structures.

Comparing the stability of different shapes.

Testing the strength of their own structures.

Identifying the weakest part of a structure.

Evaluating the strength, stiffness and stability of their own structure.

Mechanisms: Fairground Wheel

Key Knowledge:

To know that different materials have different properties and are therefore suitable for different uses.

To know the features of a Ferris wheel include the wheel, frame, pods, a base, an axle and an axle holder.

To know that it is important to test my design as I go along so that I can solve any problems that may occur.

Mechanisms: Making a moving Monster

Key Knowledge:

To know that different materials have different properties and are therefore suitable for different uses.

To know the features of a Ferris wheel, include the wheel, frame, pods, a base, an axle and an axle holder.

To know that it is important to test my design as I go along so that I can solve any problems that may occur.

Key Knowledge of Design and Technology

Year 3

By the end of the year children will have gained the following knowledge and skills:

Cooking and nutrition: Eating Seasonally

Key Knowledge:

To know that not all fruits and vegetables can be grown in the UK.

To know that climate affects food growth.

To know that vegetables and fruit grow in certain seasons.

To know that cooking instructions are known as a 'recipe'.

To know that imported food is food that has been brought into the country.

Digital World: Electric Charm

Key Knowledge:

To understand that in programming a 'loop' is code that repeats something again and again until stopped.

To know that a Micro:bit is a pocket-sized, codeable computer.

Writing a program to control (button press) and/or monitor (sense light) that will initiate a flashing LED algorithm.

Structures: Constructing a Castle

Key Knowledge:

To understand that wide and flat based objects are more stable.

To understand the importance of strength and stiffness in structures.

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.

Key Knowledge of Design and Technology

Year 4

By the end of the year children will have gained the following knowledge and skills:

Structures: Pavilions

Key Knowledge:

- To understand what a frame structure is.
- To know that a 'free-standing' structure is one that can stand on its own.
- 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.

Mechanical systems: Making a slingshot car

Key Knowledge:

- To understand that all moving things have kinetic energy.
- To understand that kinetic energy is the energy that something (object/person) has by being in motion.
- To know that air resistance is the level of drag on an object as it is forced through the air.
- To understand that the shape of a moving object will affect how it moves due to air resistance.

Electrical Systems: Torches

Key Knowledge:

- To understand that electrical conductors are materials which electricity can pass through.
- To understand that electrical insulators are materials which electricity cannot pass through.
- To know that a battery contains stored electricity that can be used to power products.
- To know that an electrical circuit must be complete for electricity to flow.
- To know that a switch can be used to complete and break an electrical circuit.

Key Knowledge of Design and Technology

Year 5

By the end of the year children will have gained the following knowledge and skills:

Electrical systems: Doodlers

Key Knowledge:

- To know that, in a series circuit, electricity only flows in one direction.
- To know when there is a break in a series circuit, all components turn off.
- To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.
- To know a motorised product is one which uses a motor to function.

Mechanical systems: Making a pop-up book

Key Knowledge:

- To know that, in a series circuit, electricity only flows in one direction.
- To know when there is a break in a series circuit, all components turn off.
- To know that an electric motor converts electrical energy into rotational movement, causing the motor's axle to spin.
- To know a motorised product is one which uses a motor to function.
- Identifying factors that could be changed on existing products and explaining how these would alter the form and function of the product.

Cooking and nutrition: What could be healthier?

Key Knowledge:

- To understand where meat comes from – learning that beef is from cattle and how beef is reared and processed, including key welfare issues.
- To know that I can adapt a recipe to make it healthier by substituting ingredients.
- To know that I can use a nutritional calculator to see how healthy a food option is.
- To understand that 'cross-contamination' means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.

Key Knowledge of Design and Technology

Year 6

By the end of the year children will have gained the following knowledge and skills:

Textiles: Waistcoats

Key Knowledge:

- 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.

Structure: Playgrounds

Key Knowledge:

- To know that structures can be strengthened by manipulating materials and shapes.
- 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.

Digital World: Navigating the world

Key knowledge:

- 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.
- To know that designers write design briefs and develop design criteria to enable them to fulfill 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.