

Design and Technology WHOLE SCHOOL OVERVIEW



Love, Care, Share...
Love learning as friends;
Care for our community as
neighbours;
Share our faith in Jesus as disciples.



St. Ethelbert's RCP

Whole School Overview for Design and Technology

DESIGN AND TECHNOLOGY STATEMENT OF INTENT:

At St. Ethelberts, we offer an inspiring and practical approach to our Design and Technology curriculum. This enables our children to develop a deeper understanding of technical and creative design in order to construct purposeful products. Children acquire a broad range of skills and knowledge to design, create and evaluate their ideas; whilst gaining an increased understanding of God's world.

Our Design Technology curriculum incorporates knowledge from other curriculum areas such as Maths, Science, Computing and Art. Each year, children also build upon their knowledge of nutrition and basic cookery skills, applying principles of understanding the importance of a balanced and varied diet. There is a breadth of practical tasks offered to our children to prepare them for secondary education, as well as aiming to provide them with useful life skills.

PREVIOUSLY COVERED IN EYFS

Creating with Materials

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Design:

ELG: Listening, Attention and Understanding

- Hold conversation when engaged in back-and-forth exchanges with their teacher and peers.

ELG: Speaking

- Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.

ELG: Self-Regulation

KS1 readiness objectives:

- Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate.
- To describe something they want to make / build / construct
- To say who they are making / building / constructing for
- To talk about what materials they are going to use when making / building / constructing

Make:

- ELG: Managing self

- Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.

ELG: Fine motor skills

- Use a range of small tools, including scissors, paintbrushes and cutlery.

ELG: Creating with Materials

- Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
- Share their creations, explaining the process they have used.

KS1 readiness objectives:

- To make / build / construct objects using a variety of materials
- To join materials together when making / building / constructing

Evaluate/Structures:

ELG: Speaking

- Express their ideas and feelings about their experiences using full sentences, including use of past, present and future tenses and making use of conjunctions, with modelling and support from their teacher.

ELG: Listening, Attention and Understanding

- Hold conversation when engaged in back-and-forth exchanges with their teacher and peers.

ELG: Speaking

- Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate;

ELG: Managing self

- Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.

ELG: Creating with Materials

- Share their creations, explaining the process they have used.

KS1 readiness objectives:

- To talk about their constructions / products, and what they are pleased with
- To talk about their constructions and say how it could be even better
- To talk about everyday objects that they like and say why they are good
- To build / construct structures from a range of materials to a design brief that they have created or been given.
- To build / construct structures that are tall or strong.
- To know that tape and glue can join materials together and can make structures stronger.

Food:

ELG: Managing self

- Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
- Set and work towards simple goals, being able to wait for what they want and control their immediate impulses when appropriate.

ELG: Fine motor skills

- Use a range of small tools, including scissors, paint brushes and cutlery;

KS1 readiness objectives:

- To recognise different foods as either healthy or unhealthy
- To know how to use basic cutlery and utensils to make and eat food
- To follow simple instructions to make different foods
- To know when we make food for other people that it needs to be appealing.

KS1 National Curriculum:

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.

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.

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:

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

YEAR 1

Autumn Term	Spring Term	Summer Term
UNIT: Making Healthy Snacks	UNIT: Moving Pictures	UNIT: Homes
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will identify a variety of fruits and vegetables, learn where they grow and explore why they are an important part of a healthy diet. They will taste and describe different fruits and vegetables before learning how to prepare food safely using appropriate hygiene and knife skills. Pupils will then design a healthy snack for a particular person or occasion, before making and evaluating their finished product against their design criteria.	In this unit, pupils will explore how pictures can be made to move using simple mechanisms. They will investigate and create sliders, levers and wheel mechanisms before designing and making a moving picture for a particular person or purpose. Throughout the unit, pupils will learn how to use tools and materials safely before evaluating their finished product against their design criteria.	In this unit, pupils will explore different types of houses and identify their key features. They will investigate a range of materials and learn how they can be cut, shaped, joined and combined to make a model house. Pupils will then design and make a house for a particular person or purpose before evaluating their finished product against their design criteria.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that eating a variety of fruit and vegetables helps us stay healthy. • Know where some common fruits and vegetables grow (e.g. on trees, bushes, vines, underground or above the ground). • Know how to prepare food safely by washing hands, keeping equipment clean and using the bridge hold and claw grip when cutting. • Know that designers plan their ideas before making a product. • Know that a finished product should be evaluated to see how well it meets the design.	• Know that a slider makes part of a picture move backwards and forwards. • Know that a lever makes part of a picture move by pivoting. • Know that a wheel mechanism can make a picture move. • Know that designers plan their ideas before making a product. • Know that a finished product should be evaluated to see how well it meets the design.	• Know that houses have different features, such as walls, roofs, doors and windows. • Know that different materials have different properties and are suitable for different purposes. • Know that materials can be cut, shaped and joined in different ways to make a model. • Know that designers plan their ideas before making a product. • Know that a finished product should be evaluated to see how well it meets the design.

Year 2

Autumn Term	Spring Term	Summer Term
UNIT: Perfect Pizzas	UNIT: Fire Engines	UNIT: Puppets
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how pizza can form part of a balanced diet by exploring food groups and a range of pizza toppings. They will taste and describe ingredients before developing their food preparation skills, including cutting, grating and tearing safely. Pupils will then design and make a healthy pizza for a chosen audience or purpose before evaluating their finished product against their design criteria.	In this unit, pupils will investigate different types of fire engines and identify their main features. They will explore how wheels, axles and a chassis work together before investigating different ways of constructing and joining materials to create the body of a vehicle. Pupils will then design and make a fire engine for a chosen purpose before evaluating their finished product against their design criteria.	In this unit, pupils will investigate a range of puppets and identify their features and how they are controlled. They will explore fabrics and practise a basic running stitch before designing and making a glove puppet for a chosen purpose or audience. Finally, they will evaluate their finished product against their design criteria.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that a healthy pizza includes ingredients from different food groups. • Know that different ingredients can change the taste, texture and appearance of a pizza. • Know how to prepare food safely using the bridge hold, claw grip and a grater. • Know that designers plan products for a purpose. • Know that evaluating a product helps identify what worked well and what could be improved.	• Know that a vehicle has three main parts: the wheels, axle and chassis. • Know that wheels and axles work together to make a vehicle move. • Know that different materials can be cut, shaped and joined to make a strong vehicle. • Know that designers plan products for a purpose. • Know that evaluating a product helps identify what worked well and what could be improved.	• Know that different types of puppets are controlled in different ways. • Know that a running stitch can be used to join fabric together. • Know that a needle and thread can be used to join materials and attach decorations. • Know that designers plan products for a purpose. • Know that evaluating a product helps identify what worked well and what could be improved.

KS2 National Curriculum:

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.

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:

- 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.

Year 3

Autumn Term	Spring Term	Summer Term
UNIT: Sandwich Snacks	UNIT: Moving Monsters	UNIT: Pencil Cases
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how sandwiches can form part of a balanced diet by exploring food groups and a range of breads and fillings. They will taste and describe different ingredients before designing a healthy sandwich for a chosen purpose or audience. Pupils will then prepare and make their sandwich safely before evaluating their finished product against their design criteria.	In this unit, pupils will investigate familiar objects that use air to create movement before exploring how simple pneumatic systems work. They will learn how syringes and tubing can be combined to create a pneumatic mechanism before designing and making a moving display for a chosen theme. Finally, they will evaluate their finished product against their design criteria.	In this unit, pupils will investigate a range of pencil cases and identify the features that make them functional and appealing. They will develop their sewing skills by learning how to use a running stitch and a whip stitch before selecting the most suitable stitch for their product. Pupils will then design and make a pencil case for a chosen user, using appropriate fastenings and decorative techniques. Finally, they will evaluate their finished product against their design criteria.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that a healthy sandwich includes ingredients from different food groups. • Know that different breads and fillings can change the taste, texture and appearance of a sandwich. • Know how to prepare food safely using appropriate equipment and good food hygiene. • Know that designers plan products to meet the needs of a chosen user. • Know that products should be evaluated against the design criteria to identify strengths and improvements.	• Know that pneumatics use air to create movement. • Know that syringes and tubing can be used to make a simple pneumatic system. • Know that pneumatic systems can be used to make parts of a model or display move. • Know that designers plan products to meet the needs of a chosen user. • Know that products should be evaluated against the design criteria to identify strengths and improvements.	• Know that a pencil case should be functional, strong and appealing for its user. • Know how to use a running stitch and a whip stitch, choosing the most suitable stitch for the product. • Know that different fastenings and decorative techniques can improve a textile product. • Know that designers plan products to meet the needs of a chosen user. • Know that products should be evaluated against the design criteria to identify strengths and improvements.

Year 4

Autumn Term	Spring Term	Summer Term
UNIT: Light Up Signs	UNIT: Alarms	UNIT: Mini Greenhouses
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how simple electrical circuits can be used to illuminate signs. They will explore a range of electrical components, including bulbs, LEDs, switches and batteries, before designing and making a light-up sign for a chosen purpose or audience. Pupils will learn how to construct a working circuit safely and incorporate it into their design before evaluating their finished product against their design criteria.	In this unit, pupils will investigate how alarm systems use electrical circuits and switches to solve everyday problems. They will explore a range of switches and electrical components before designing and making an alarm system for a chosen purpose. Finally, they will evaluate their finished product against their design criteria.	In this unit, pupils will investigate how greenhouses help plants to grow and explore what makes a structure stable. They will investigate suitable materials and different methods of joining and strengthening before designing and making a mini greenhouse for a chosen purpose. Finally, they will evaluate their finished product against their design criteria.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that a complete electrical circuit is needed to make a bulb or LED light. • Know that switches can be used to control a circuit by turning it on and off. • Know that electrical components, such as bulbs, LEDs, batteries and wires, each have a different purpose in a circuit. • Know that design criteria help designers create successful products. • Know that evaluating a product against its design criteria helps improve future designs.	• Know that a complete electrical circuit is needed for an alarm to work. • Know that different types of switches can be used to control a circuit. • Know that electrical components, such as switches, buzzers, bulbs, batteries and wires, each have a different purpose in a circuit. • Know that design criteria help designers create successful products. • Know that evaluating a product against its design criteria helps improve future designs.	• Know that a stable structure needs a strong base and can be strengthened in different ways. • Know that different materials have different properties and are suitable for different purposes. • Know that materials can be joined and strengthened using a range of techniques. • Know that design criteria help designers create successful products. • Know that evaluating a product against its design criteria helps improve future designs.

Year 5

Autumn Term	Spring Term	Summer Term
UNIT: Bread	UNIT: Moving Toys	UNIT: Fashion and Textiles
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate a range of bread products and explore how bread can form part of a balanced diet. They will investigate how different ingredients and mixing methods affect the finished product before designing and making a bread product for a chosen user or purpose. Finally, they will evaluate their finished product against their design criteria.	In this unit, pupils will investigate toys with moving cam mechanisms and explore how different types of cams create different movements. They will investigate ways of strengthening structures before designing and making a moving toy with a cam mechanism for a chosen user or purpose. Finally, they will evaluate their finished product against the needs of the intended user and identify how it could be improved.	In this unit, pupils will investigate and analyse products made from textiles, exploring how fabrics are produced, joined and decorated. They will develop their textile skills by using pattern pieces to measure, mark and cut fabric accurately before selecting appropriate sewing and decorative techniques to create a textile product for a chosen user or purpose. Finally, they will evaluate their finished product against the needs of the intended user and identify how it could be improved.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that bread can be part of a healthy, balanced diet. • Know that different ingredients and mixing methods affect the texture and appearance of bread. • Know how to measure ingredients accurately and prepare food safely. • Know that annotated designs help designers communicate and develop their ideas. • Know that evaluation should consider how well a product meets the needs of its intended user and how it could be improved.	• Know that a cam mechanism changes rotary motion into linear motion. • Know that different shaped cams create different movements. • Know that structures can be strengthened in different ways to make a product more stable. • Know that annotated designs help designers communicate and develop their ideas. • Know that evaluation should consider how well a product meets the needs of its intended user and how it could be improved.	• Know that different fabrics have different properties and are suitable for different purposes. • Know that pattern pieces help designers measure, mark and cut fabric accurately. • Know that different sewing and decorative techniques can be chosen to create functional and attractive textile products. • Know that annotated designs help designers communicate and develop their ideas. • Know that evaluation should consider how well a product meets the needs of its intended user and how it could be improved

Year 6

Autumn Term	Spring Term	Summer Term
UNIT: Bridges	UNIT: Fairground	UNIT: Funky Furnishings
KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:	KEY KNOWLEDGE & SKILLS:
In this unit, pupils will investigate how different bridge structures are designed to span gaps and support loads. They will explore how beams, pillars, trusses, arches and suspension systems strengthen bridges before developing design criteria and creating a prototype bridge for a chosen purpose. Finally, they will test and evaluate their bridge against their design criteria, considering how it could be refined and improved.	In this unit, pupils will investigate how fairground rides use electrical circuits, motors and pulley systems to create movement. They will explore ways of constructing strong frameworks before designing and making a model fairground ride with a rotating part for a chosen user or purpose. Finally, they will evaluate their finished product against the needs of the intended user, considering how it could be refined and improved.	In this unit, pupils will investigate and evaluate a range of soft furnishings, considering how fabrics, joining methods, decorative techniques and fastenings affect their function and appearance. They will select appropriate materials and textile techniques before designing and making a cushion cover for a chosen user or purpose. Finally, they will evaluate their finished product against the needs of the intended user, considering how it could be refined and improved.
KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE	KEY STICKY KNOWLEDGE
• Know that different bridge structures (beam, arch, truss and suspension) are designed for different purposes. • Know that forces such as tension and compression affect how structures support loads. • Know that structures can be strengthened by selecting appropriate materials and construction techniques. • Know that designs should be adapted and refined throughout the making process. • Know that evaluation should consider the effectiveness of the design, construction, function and suitability for the intended user.	• Know that electrical circuits and motors can be used to create movement. • Know that pulley and belt systems can be used to transfer movement. • Know that strong frameworks provide stability and support moving parts. • Know that designs should be adapted and refined throughout the making process. • Know that evaluation should consider the effectiveness of the design, construction, function and suitability for the intended user.	• Know that different fabrics, fastenings and decorative techniques are suitable for different purposes. • Know that a range of sewing techniques can be selected to create strong, functional and attractive textile products. • Know that the choice of materials and construction methods affects the quality and durability of a product. • Know that designs should be adapted and refined throughout the making process. • Know that evaluation should consider the effectiveness of the design, construction, function and suitability for the intended user.