

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 |
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| UNIT: Eat more fruit and vegetables | UNIT: Moving Pictures | UNIT: Homes |
| KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: |
| In this unit, pupils will find out the favourite fruits and vegetables in the class and present the data as a pictogram. They will also examine, taste and describe a variety of fruits and vegetables. The pupils will find out how to handle and prepare a variety of fruits and vegetables safely. This will enable them to design a recipe, which will include fruit and/or vegetables for a particular person or event. Finally, they will make and then evaluate their food product based on their design. | In this unit, pupils will create a slider, then use levers to create a moving mechanism. They will also investigate and create wheel mechanisms. Pupils will design a picture with a moving mechanism. Finally, they will make a moving picture based on their design for a particular person or event. Once completed, they will evaluate it. | In this unit, pupils will explore different types of houses and identify their key shapes and features. Then (using a variety of materials) will investigate how to join and combine shapes to make a house. Pupils will later investigate different ways of creating the interior features of a house. They will design and create a house for a particular person or family. Finally, they will evaluate their work. |
| KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE |
| <ul style="list-style-type: none"> • Know that fruits and vegetables are an important part of a healthy diet. • Know the names of and be able to describe familiar fruits and vegetables. • Know that skin, flesh and seeds are parts of fruit and vegetables. • Know that knives are sharp and that they need to be handled safely. • Know that it is important to wash hands before handling food. | <ul style="list-style-type: none"> • Know that a slider is a bar which moves backwards and forwards along a straight line. • Know that you need to combine a lever and a pivot to create movement. • Know that wheel mechanisms can be used to make pictures move. • Know that scissors and split pins are sharp and need to be handled safely. | <ul style="list-style-type: none"> • Know that houses contain the shapes rectangles, squares and triangles. • Know that a hinge mechanism will make something open and close. • Know that glue, tape, staples, blu-tak, elastic bands and string can be used to join materials together. • Know how to work safely with scissors, glue, staplers and elastic bands. |

Year 2

| Autumn Term | Spring Term | Summer Term |
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| UNIT: Perfect Pizzas | UNIT: Vehicles | UNIT: Puppets |
|---|--|--|
| KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: |
| In this unit, pupils will find out what the favourite pizzas in the class are and record their findings. They will examine, describe and categorise a variety of bread-based products and pizza toppings. They will use this information to help them to design and make a balanced healthy pizza for a chosen audience or event. Finally, they will evaluate their product. | In this unit, pupils will investigate a variety of vehicles as well as their uses and features. They will then investigate the component parts of vehicles to see how they work: wheels, axles and chassis. Pupils will then use this experience to investigate various ways of creating and decorating the body of a vehicle. They will then design their own vehicle for a particular purpose and make it according to their design. Finally, they will evaluate their product. | In this unit, pupils will investigate a range of puppets and describe their main features. They will work with fabric to create a finger puppet. First, they will practise and develop their basic sewing skills using a running stitch and an over stitch. They will use their investigations and knowledge to help them design and make a glove puppet for a particular purpose or audience. Finally, they will evaluate their product. |
| KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE |
| <ul style="list-style-type: none"> • Know that pizza is made up of a base and toppings. • Know that pizza bases could be made from bagels, wraps, sliced bread and baguettes. • Know that pizza can be part of a balanced diet. • Know that pizza toppings can include tomato sauce, vegetables and protein. • Know that knives and graters are sharp and that they need to be handled safely. • Know that it is important to wash hands and surfaces before handling food. | <ul style="list-style-type: none"> • Know the main features of a vehicle – wheel, chassis and axle. • Know that axles can work in two ways: <ul style="list-style-type: none"> ○ they are either attached firmly to the wheel so the axle rotates and the wheels turn with it, ○ ... or the wheels are placed loosely on the axle so that the wheels turn around the axle. • Know how to combine materials to create the body of a vehicle using cool melt glue guns and masking tape. • Know that hack saws, cardboard saws, scissors and cool melt glue guns need to be handled safely and may need a vice. | <ul style="list-style-type: none"> • Know that a puppet is a model version of a person or animal that is controlled by someone • Know a variety of different types of puppets and how they are controlled – marionette puppet (string), sock puppet and hand puppet (hand), finger puppet (finger), rod puppet (stick). • Know that a running stitch and an over stitch can be used to join material together • Know that a needle and thread can attach a button to material • Know that sewing needles and scissors are sharp and that they need to be handled safely |

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 Animals | UNIT: Money Containers |
| KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: |
| In this unit, pupils will find out what the favourite sandwich fillings in the class are and record their findings. They will taste a variety of different breads and sandwiches and examine flavours and textures. Pupils will then think about their preferences and use this to help them design a sandwich for a purpose. Then, pupils will create their sandwiches, working safely and hygienically. Finally, they will evaluate their food product. | In this unit, pupils will investigate a variety of familiar objects that use air to make them work. They will then explore techniques for making simple pneumatic systems. The pupils will design and make an animal which includes a moving pneumatic system. Finally, they will evaluate their finished product. | In this unit, pupils will explore a range of money containers and examine their features. They will learn how to sew using a range of different stitches, including running stitch; overstitch & backstitch. Pupils will then gather ideas and design their own money container. They will use their plan and their sewing skills to join textiles together to create a final product, which will be evaluated. |
| KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE |
| <ul style="list-style-type: none"> • Know the names of the different food groups – fats and sugars, protein and dairy, fruit and vegetables and carbohydrates. • Know the names of and be able to describe different types of breads – wraps, pitta, baguette, brioche, sliced white and wholemeal. • Know the names of and be able to describe different types of sandwich fillings – tuna mayo, egg mayo, cheese, ham, jam, salmon paste. • Know that knives and graters are sharp and that they need to be handled safely. • Know that it is important to wash hands and surfaces before handling food. | <ul style="list-style-type: none"> • Know that pneumatics means something is moved using air. • Know that hydraulics means something is moved using water. • Know that syringes and tubing can be attached to make a pneumatic mechanism. • Know that hack saws, cardboard saws, scissors and cool melt glue guns need to be handled safely and may need a vice. | <ul style="list-style-type: none"> • Know that money containers are designed to contain money. • Know and be able to use a running stitch, an overstitch and a backstitch to join materials. • Know that they need to follow their design when creating a finished product. • Know that sewing needles and scissors are sharp and that they need to be handled safely |

Year 4

| Autumn Term | Spring Term | Summer Term |
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| UNIT: Seasonal Food | UNIT: Alarms | UNIT: Photograph Frames |
| KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: | KEY KNOWLEDGE & SKILLS: |
| In this unit, pupils will explore how seasonal fruits in Britain are grown and processed. They will understand why vegetables, seasonally produced meat and fish form an important part of a healthy and varied diet. Finally pupils will create a dish using seasonal foods – e.g. pumpkin | In this unit, pupils will investigate what alarm systems are used for and how different types of switches are activated. They will learn how to create circuits with a variety of different switches. Pupils will design and make an alarm system for a particular purpose. Finally, they will evaluate their finished product. | In this unit, pupils will investigate free-standing structures and how they are made stable. They will explore different ways of strengthening and joining paper and card. Pupils will design a photograph frame for a particular purpose, then make it according to their design. Finally, they will evaluate their finished product. |
| KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE |
| <ul style="list-style-type: none"> Know that some foods are eaten at certain times of the year – seasonal foods. Know why certain foods are available all year round in Britain because they are imported. Know that pumpkins are only in season for a short amount of time. Know that knives, peelers and graters are sharp and that they need to be handled safely. Know that hot plates on a cooker should not be touched. Know that it is important to wash hands and surfaces before handling food. | <ul style="list-style-type: none"> Know a variety of different types of alarms: fire alarm, alarm clock, digital alarm e.g. Alexa, microwave, house alarm, smoke detector. Know the four main switches used in alarms: press to break, press to make, tilt and on / off. Know the electrical components in a circuit: wire, switch, battery bulb/buzzer, motor. Know that mains electricity can be very dangerous. Know that a circuit needs to be closed in order to work. Know that hack saws, cardboard saws, scissors and cool melt glue guns need to be handled safely and may need a vice. | <ul style="list-style-type: none"> Know that everyday free-standing objects have been made stable by having a wide base. Know that folding, rolling and layering will strengthen paper or card. Know the different features and components of a photograph frame – frame, picture, stand, backboard. Know that hack saws, cardboard saws, scissors and cool melt glue guns need to be handled safely and may need a vice. |

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: |
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In this unit, pupils will investigate (taste) and evaluate bread products according to their characteristics. They will learn how bread products can be an important part of a balanced diet and can be eaten in different ways. Pupils will find out which different ingredients are needed to make bread and how ingredients can be altered and mixed to create different effects. They will design and make a bread product for a particular person or event. Finally, pupils will evaluate their product and decide if it is fit for purpose.

In this unit, pupils will investigate toys with moving cam mechanisms. They will investigate different types of cam mechanisms to see how each creates a different motion. They will then investigate ways of strengthening structures for a moving toy. Pupils will then use what they have learnt to design and make a moving toy with a cam mechanism. Finally, they will evaluate their product.

In this unit, pupils will investigate and analyse items made using textiles. They will handle and explore textiles to discover how the materials are joined and decorated. They will design and make an item using textiles, for a purpose and person. This will include the use of pattern pieces to measure, mark and cut their chosen fabric. Then, (developing basic sewing stitches they studied in Y3) they will hand-sew design elements. This will include a hem stitch. They will also add decorative features such as buttons and sequins. Finally, they will self and peer assess their work to see if it meets the original brief.

KEY STICKY KNOWLEDGE

- Know the name and origin of a number of bread products; nann, pitta, bagel, fruit loaf, bread roll, soda bread,
- Know that bread is a carbohydrate and that it can be part of healthy balanced diet.
- Know the basic recipe for bread includes strong flour, water, yeast, salt,
- Know that scales are used to weigh ingredients accurately.
- Know that kneading means to work the flour and water into a dough.
- Know that it is important to wash hands and surfaces before handling food.

KEY STICKY KNOWLEDGE

- Know that a cam mechanism will change rotary motion into linear motion.
- Know how different shaped cams (such as snail oval and heart shape) change the movement of the follower.
- Know how to make a cuboid out of wood to hold their Cam Toy.
- Know that hack saws, cardboard saws, scissors and cool melt glue guns need to be handled safely and may need a vice.

KEY STICKY KNOWLEDGE

- Know the main stages of cotton production: cotton is grown and picked; bales of lint are spun into yarn at the factory; it is wound on to bobbins; the bobbins are dyed and then spun on a loom to make cloth.
- Know that a variety of materials can be joined together using: zips, buttons, string and stitching.
- Know how to draw pattern pieces, adding details such as seam allowances, then use these to measure and cut material.
- Know how to hand-sew to join material together including the use of a hem stitch.

Year 6

Autumn Term

UNIT: Burgers

KEY KNOWLEDGE & SKILLS:

In this unit, pupils will explore various types of burgers and their nutrition facts. They will taste and

Spring Term

UNIT: Fairground

KEY KNOWLEDGE & SKILLS:

In this unit, pupils will look at a range of familiar products that use rotating parts. They will investigate ways of using electrical motors to create

Summer Term

UNIT: Bridges

KEY KNOWLEDGE & SKILLS:

In this unit, pupils will explore ways in which pillars and beams are used to span gaps. They will look at

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| <p>evaluate a variety of sauces and garnishes. Then they will learn how to make burger patties safely, hygienically and accurately. Pupils will then explore a variety of burger buns and assess their suitability. Using their experiences and preferences, they will make informed decisions when making their own burger. Finally, they will evaluate their finished product.</p> | <p>rotating parts. They will experiment with various materials to create a free-standing framework for a fairground ride. They will design and make their own fairground ride with a rotating part controlled by a coding app. Finally, they will evaluate their finished product.</p> | <p>the ways in which trusses and arches can be used to strengthen bridges. They will examine the architecture and design of suspension bridges to understand how they are able to span long distances. They will develop criteria and design a prototype bridge for a purpose. They will build this according to their design and then finally test and evaluate their finished bridge.</p> |
| KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE | KEY STICKY KNOWLEDGE |
| <ul style="list-style-type: none"> • Know that nutrition labels indicate the amounts of calories, salts, sugars in foods • Know the names of a variety of sauces to accompany burgers such as: mayonnaise, ketchup, and mustard. • Know that when working with raw meat, hands need to be washed regularly so there is no cross—contamination | <ul style="list-style-type: none"> • Know that electrical circuits and motors make objects rotate in fairground rides. • Know that pulley and belt systems can be used to transfer movement. | <ul style="list-style-type: none"> • Know how beam and pillar bridges are constructed. • Know that truss and arch bridges spread the load (weight) of objects travelling across them. • Know how tension and compression forces are distributed by suspension bridges. • Know how to stiffen and strengthen structures in order to create a prototype model which can support a given weight.(e.g. a toy car) |