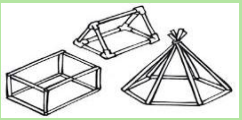
Castle View Primary School Design & Technology Curriculum

Year 1 – Structures - Free Standing Structures



Prior learning- To know how to make a free-standing structure from blocks/ boxes; To know how to make a structure taller; To know how to fasten structures together; To name different structures from around the world.

National Curriculum Objectives:
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

Assessment Questions:
Can you show me/ tell me about your structure?
Can you show me/ tell me how you made it strong?
Can you show me/ tell me how you decorated your structure to complete it?
Can you show me/ tell me about any 3D shapes in your structure?
Can you tell me what you like and dislike about your product?

Key Unit Objectives:

Free Standing structures
To know what a structure is.
To understand how and to make a free-standing structure stronger, stiffer and stable.
To know and use some simple finishing techniques to complete their structure.
To know the names of and spot some simple 3D shapes in their structures.

Research
To explore existing products- Who is it for? What is the product used for?
To look at famous inventors and designers.

Design
To suggest ideas and talk about what product they will be designing and making to others.
To model their ideas on paper creating simple designs.

Make
To select from and use simple utensils, tools and equipment.
To use a range of tools to cut, join and combine materials safely and correctly.
To use techniques such as cutting, bending etc

Evaluate
To talk about what they like and dislike about their product.

Key Vocabulary:
structure, build, shape, 3D shapes, strong, stable, stiff, free-standing, top, side, base, join, finishing, decorate, like, dislike.

Key Designers/ Architects/ Inventors:
Sir William Chambers, Gustave Eiffel, Santiago Calatrava

Castle View Primary School Design & Technology Curriculum

Year 1 – Mechanisms - Sliders and Levers

Prior learning- To know how to manipulate paper in different ways by curling, bending and tearing; To name basic construction tools e.g. glue, tape, scissors; To be ale to use scissors to cut; To be able to use hole punches, split pins; To have experience of making simple flaps and hinges.

National Curriculum Objectives:
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
Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Assessment Questions:
Can you tell me what a mechanism is?
Can you show me your slider and lever? What do they do?
Can you show me a fixing technique you have used?
Can you tell me what you like and dislike about your product?

Key Unit Objectives:
Sliders and Levers
To understand what a mechanism is.
To understand what sliders and levers do and use these.
To know and use different fixing techniques.

Research
To explore existing products- Who is it for? What is the product used for?
To look at famous inventors and designers.

Design
To suggest ideas and talk about what product they will be designing and making to others.
To model their ideas on paper creating simple designs.

Make
To select from and use simple utensils, tools and equipment.
To use a range of tools to cut, join and combine materials safely and correctly.
To use techniques such as cutting, bending etc

Evaluate
To talk about what they like and dislike about their product.

Key Vocabulary:
mechanism, move, lever, slider, slot, pivot, push, pull, up and down, side to side, guide/bridge, fix, join, glue, tape, split pin, like, dislike.

Key Designers/ Architects/ Inventors:
Zaha Hadid, Frank Lloyd Right

Castle View Primary School Design & Technology Curriculum

Year 1 – Food - Cooking and Nutrition

Prior learning- To understand the importance of handwashing before cooking to remove germs; To be able to use tools correctly and safely e.g. scissors, spoons; To understand which foods are healthy and unhealthy; To understand that eating well contributes to good health.

National Curriculum Objectives:
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

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

Key Unit Objectives:

Cooking and Nutrition
To understand where food comes from e.g. farm, grown.
To understand the need for a variety of foods in the diet.
To understand the importance of hand washing and wearing an apron when preparing food.
To know how to follow a recipe.

Research
To explore existing products- Who is it for? What is the product used for?
To look at famous inventors and designers.

Design
To suggest ideas and talk about what product they will be designing and making to others.
To model their ideas on paper creating simple designs.

Make
To select from and use simple utensils, tools and equipment.
To use a range of tools to cut, join and combine materials safely and correctly.
To use techniques such as mixing etc.

Evaluate
To talk about what they like and dislike about their product.

Assessment Questions:
Can you tell me where some of our food comes from?
Can you tell me why it is important to eat different foods?
Why do we wash our hands and wear an apron?
Can you tell me what you like and dislike about your product?

Key Vocabulary:
fruit, vegetables, healthy, unhealthy, taste, smell, texture, appearance, safety, hand washing, apron, health, recipe, clean, germs, like and dislike.

Key Chefs:
Nadiya Hussain, Sunny Anderson

Castle View Primary School Design & Technology Curriculum

Year 2 – Mechanisms - Wheels and Axles

Prior learning- To understand what a mechanism is; To understand what sliders and levers do and use these; To know and use different fixing techniques.

National Curriculum Objectives:
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
Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Assessment Questions:
Can you show me/ tell me what a wheel is? What is an axle? What does an axle holder do?
Can you show me/ tell me the difference between fixed and free moving axles?
How did you fix the wheels and axles to your product?
Tell me what you like and dislike about your product?
Tell me how it could be made even better?

Key Unit Objectives:

Wheels and Axles
To know and understand what wheels, axles and axles holders are.
To know the difference between fixed and free moving axles.
To know how to fix wheels and axels to a product.

Research
To explore some existing products- Which materials are used? How do the products work?
To express opinions about the different products they have researched.
To research famous inventors and designers.

Design
To develop their design ideas through discussion and drawings.
To identify a clear purpose for what and who they intend to design and make their product for (design criteria).
To draw simple sketches with notes to record their ideas.

Make
To choose appropriate tools, equipment, techniques and materials.
To begin to safely measure, cut and shape materials using different tools.

Evaluate
To talk about what they like and dislike about a product, and how it could be made even better.

Key Vocabulary:
Wheel, axle, axle holder, fixed axle, free-moving axle, attach, turn, vehicle, rotate, movement.

Key Designers/ Architects/ Inventors:
Henry Ford, Eero Saarinen

Castle View Primary School Design & Technology Curriculum

Year 2 – Textiles – Templates and Joining

Prior learning- To join two pieces of material together e.g. gluing, stapling, stitching; To colour fabrics using paint and pens; To add decorations to fabrics such as buttons and beads; To use simple tools safely and correctly e.g. scissors, hole punch; To join, assemble and combine materials using temporary methods e.g. glue and tape.

National Curriculum Objectives:
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

Assessment Questions:
Can you tell me about the fabrics you have chosen?
Can you tell me about/ show me the stitch you used to secure your two pieces of fabric together?
What is a template? Can you tell me how you used it?
What did you do to finish your product?
Tell me what you like and dislike about your product?
Tell me how it could be made even better?

Key Unit Objectives:

Templates and Joining
To sort fabrics according to their qualities.
To use a simple running stitch to secure two pieces of fabric together.
To know what a template is and use one to cut out a shape.
To know and use a range of finishing techniques.

Research
To explore some existing products- Which materials are used? How do the products work?
To express opinions about the different products they have researched.
To research famous inventors and designers.

Design
To develop their design ideas through discussion and drawings.
To identify a clear purpose for what and who they intend to design and make their product for (design criteria).
To draw simple sketches with notes to record their ideas.

Make
To choose appropriate tools, equipment, techniques and materials.
To begin to safely measure, cut and shape materials using different tools.

Evaluate
To talk about what they like and dislike about a product, and how it could be made even better.

Key Vocabulary:
Fabric, sort, group, soft, rough, stretchy, running stitch, needle, thread, sew, join, template, cut, shape, decorate, finishing, stick, sequin, button.

Key Designers/ Architects/ Inventors:
Victoria Rose Richards, Kate Park

Castle View Primary School Design & Technology Curriculum

Year 2 – Food – Preparing Fruit and Vegetables

Prior learning- To understand where food comes from e.g. farm, grown; To understand the need for a variety of foods in the diet; To understand the importance of hand washing and wearing an apron when preparing food; To know how to follow a recipe.

National Curriculum Objectives:
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

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

Assessment Questions:
Where does our food come from? Can you give me an example of foods which are farmed, grown and caught?
What does a 'balanced meal/ diet' mean?
What could happen if we don't follow safety rules when preparing food?
Tell me what you like and dislike about your product?
Tell me how it could be made even better?

Key Unit Objectives:

Preparing Fruits and Vegetables
To understand that all food must be farmed, grown, or caught.
To understand the principles of a balanced diet and its importance.
To know and follow some safety procedures e.g. regular hand washing
To follow a simple recipe independently.

Research
To explore some existing products- Which materials are used? How do the products work?
To express opinions about the different products they have researched.
To research famous inventors and designers.

Design
To develop their design ideas through discussion and drawings.
To identify a clear purpose for what and who they intend to design and make their product for (design criteria).
To draw simple sketches with notes to record their ideas.

Make
To choose appropriate tools, equipment, techniques and materials.
To begin to safely measure, cut and shape materials using different tools.

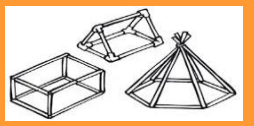
Evaluate
To talk about what they like and dislike about a product, and how it could be made even better.

Key Vocabulary:
Farm, grown, caught, food, balanced diet, healthy, fruit, vegetables, protein, carbohydrates, dairy, fats, sugars, meal, safety, clean, wash hands, germs, hygiene, instructions, recipe.

Key Chefs:
Tom Kerridge, Nigella Lawson

Castle View Primary School Design & Technology Curriculum

Year 3 – Structures – Shell structures



Prior learning- To know what a structure is; To understand how and to make a free-standing structure stronger, stiffer and stable; To know and use some simple finishing techniques to complete their structure; To know the names of and spot some simple 3D shapes in their structures.

National Curriculum Objectives:
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.

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 to program, monitor and control their products.

Assessment Questions:
Can you tell me what a shell structure is?
What did you do to make your shell structure stronger? Can you name one or two ways to stiffen or strengthen your design?
What is a net used for? What shape will your net make when folded?
Does your product do what you planned in your design criteria?
Who is your product made for? What do you think they would like about your product?

Key Unit Objectives:

Shell structures
To know what a shell structure is.
To explore/name more sophisticated methods for stiffening and strengthening structures.
To know how to and be able to create a shape net.
To know how to test a materials strength.

Research
To explore some existing products- When was the product made? Where was the product designed and made?
To evaluate the product on its design, material and its use.
To research famous inventors and designers.

Design
To identify a purpose and establish a design criteria for a product.
To develop ideas by producing drawings and diagrams.
To develop more than one design from the initial design.

Make
To safely measure, mark out, cut, assemble and join with some accuracy.
To make sensible choices from a wider range of tools and materials.

Evaluate
To use their design criteria to evaluate their product; identify strengths and areas for development.
To consider the views of the user whilst evaluating.

Key Vocabulary:
Structure, shell structure, surface, strong, stiff, fold, layer, tab, brace, net, cube, cuboid, edge, face, material, test, flexible, rigid, tear, durable.

Key Designers/ Architects/ Inventors:
Sue Kirk, Felix Candela

Castle View Primary School Design & Technology Curriculum

Year 3 – Textiles – 2D shape to a 3D product

Prior learning- To sort fabrics according to their qualities; To use a simple running stitch to secure two pieces of fabric together; To know what a template is and use one to cut out a shape; To know and use a range of finishing techniques.

National Curriculum Objectives:
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.

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

Assessment Questions:
Can you carefully thread a smaller-eyed needle? How did you find it?
Can you tell me which type of stitch you used to join your fabrics together?
Can you tell me how you added pattern and texture to your piece using a stitch?
Can you tell me how you added decoration to your piece?
Does your product do what you planned in your design criteria?
Who is your product made for? What do you think they would like about your product?

Key Unit Objectives:

2D shape to 3D shape
To use smaller eyed needles and finer threads to stitch.
To practise and use more complex sewing techniques such as cross- stitch to join fabrics together.
To use stiches to develop pattern and texture to a piece.
To apply decoration to a piece using beads, buttons, feathers.

Research
To explore some existing products- When was the product made? Where was the product designed and made?
To evaluate the product on its design, material and its use.
To research famous inventors and designers.

Design
To identify a purpose and establish a design criteria for a product.
To develop ideas by producing drawings and diagrams.
To develop more than one design from the initial design.

Make
To safely measure, mark out, cut, assemble and join with some accuracy.
To make sensible choices from a wider range of tools and materials.

Evaluate
To use their design criteria to evaluate their product; identify strengths and areas for development.
To consider the views of the user whilst evaluating.

Key Vocabulary:
Needle, thread, fabric, felt, beads, buttons, feathers, stitch, running stitch, cross stitch, back stitch, decoration, pattern, texture, thread the needle, join, attach, secure.

Key Designers/ Architects/ Inventors:
Bisa Butler, Anni Alders

Castle View Primary School Design & Technology Curriculum

Year 3 – Food – Healthy and Varied Diet

Prior learning- To understand that all food must be farmed, grown, or caught; To understand the principles of a balanced diet and its importance; To know and follow some safety procedures e.g. regular hand washing; To follow a simple recipe independently.

National Curriculum Objectives:
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.

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

Cooking and Nutrition
-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

Key Unit Objectives:

Healthy and Varied Diet
To know the five food groups from the eat-well plate.
To understand that all foods must be farmed, grown or caught and that food comes from the UK and across the world.
To know safety and food hygiene procedures and follow them confidently.

Research
To explore some existing products- When was the product made? Where was the product designed and made?
To evaluate the product on its design, material and its use.
To research famous inventors and designers.

Design
To identify a purpose and establish a design criteria for a product.
To develop ideas by producing drawings and diagrams.
To develop more than one design from the initial design.

Make
To safely measure, mark out, cut, assemble and join with some accuracy.
To make sensible choices from a wider range of tools and materials.

Evaluate
To use their design criteria to evaluate their product; identify strengths and areas for development.
To consider the views of the user whilst evaluating.

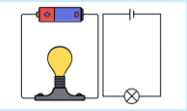
Assessment Questions:
Can you name the five food groups on the eat-well plate? Where does your food come from? Can you name three ways food is produced? Can you name a food that comes from the UK? And another country?
What safety and food hygiene procedures did you follow?
Does your product do what you planned in your design criteria?
Who is your product made for? What do you think they would like about your product?

Key Vocabulary:
Eat- well plate, fruits and vegetables, protein, carbohydrates, dairy, fats and sugars, farmed, grown, caught, UK, world, hygiene, safe, cook, clean, germs.

Key Chefs:
Jamie Oliver, Guy Fieri

Castle View Primary School Design & Technology Curriculum

Year 4 – Electrical Systems – Simple circuits and switches



Prior learning- Electrical Systems not been previously taught, however children may have some awareness around electricity and electrical circuits.

National Curriculum Objectives:
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.

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
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Key Unit Objectives:

Simple circuits and switches
To know and understand what an electrical circuit is.
To know and understand what a bulb, buzzer and switch is and their functions.
To construct a simple series circuit to generate static electricity.
To know how to make simple secure connections.

Research
To explore some existing products- How well does the product achieve its purpose? how environmentally friendly is the product?
To evaluate the product on design and use and appearance.
To research and find out about famous inventors and designers.

Design
To develop their own design criteria.
To use their market research to inform the design of their product.
To record the plan using exploded designs.

Make
To use techniques to accurately cut, shape, join and finish their work.
To choose the most appropriate resources for the intended outcome.

Evaluate
To evaluate their work both during and at the end of the process.
To carry out appropriate tests before making any improvements.

Assessment Questions:
Can you explain what an electrical circuit is? What happens if a circuit is not complete? What does a bulb do in a circuit? How does a buzzer work in an electrical circuit? What is the purpose of a switch? Why is it important to make secure connections in a circuit? Can you evaluate your work during and at the end of the process? What tests did you complete before making improvements? How well does your product meet the needs of the intended user?

Key Vocabulary:
Electrical circuit, complete circuit, wire, battery, bulb, buzzer, switch, electricity, secure connections

Key Designers/ Architects/ Inventors:
Thomas Edison, Nikola Tesla

Castle View Primary School Design & Technology Curriculum

Year 4 – Mechanisms – Levers and Linkages

Prior learning- To know and understand what wheels, axles and axles holders are; To know the difference between fixed and free moving axles; To know how to fix wheels and axels to a product.

National Curriculum Objectives:
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.

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
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

Assessment Questions:
Can you tell me/ show me - What is a lever? What is a linkage?
Can you tell me/ show me the difference between a fixed and loose pivot?
What is the purpose of a guide in a moving mechanism?
Can you evaluate your work during and at the end of the process? What tests did you complete before making improvements? How well does your product meet the needs of the intended user?

Key Unit Objectives:

Levers and Linkages
To know and understand how to use lever and linkages mechanisms.
To know the difference between a fixed and loose pivot.
To know and create guides to control movement.

Research
To explore some existing products- How well does the product achieve its purpose? how environmentally friendly is the product?
To evaluate the product on design and use and appearance.
To research and find out about famous inventors and designers.

Design
To develop their own design criteria.
To use their market research to inform the design of their product.
To record the plan using exploded designs.

Make
To use techniques to accurately cut, shape, join and finish their work.
To choose the most appropriate resources for the intended outcome.

Evaluate
To evaluate their work both during and at the end of the process.
To carry out appropriate tests before making any improvements.

Key Vocabulary:
Lever, linkages, movement, mechanisms, pivot, loose, fixed, guide, control, movement.

Key Designers/ Architects/ Inventors:
Jacques de Vaucanson, Frank Gehry

Castle View Primary School Design & Technology Curriculum

Year 4 – Food – Healthy and Varied Diet

Prior learning- To know the five food groups from the eat-well plate; To understand that all foods must be farmed, grown or caught and that food comes from the UK and across the world; To know safety and food hygiene procedures and follow them confidently.

National Curriculum Objectives:
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.

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

Cooking and Nutrition
-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

Key Unit Objectives:

Healthy and Varied Diet
To understand what nutritional benefits different food types give us.
To know where to find the nutritional information on packaging.
To know which foods are grown in different countries and continents.
To know and follow a range of safety and food hygiene procedures.

Research
To explore some existing products- How well does the product achieve its purpose? how environmentally friendly is the product?
To evaluate the product on design and use and appearance.
To research and find out about famous inventors and designers.

Design
To develop their own design criteria.
To use their market research to inform the design of their product.
To record the plan using exploded designs.

Make
To join and combine ingredients by kneading.
To use cooking techniques such as slicing, mixing, spreading, and baking.
To measure and weight a range of ingredients using scales competently.
To cook using a heat source with some supervision setting the temperature.

Evaluate
To evaluate their work both during and at the end of the process.
To carry out appropriate tests before making any improvements.

Assessment Questions:
Which foods help us to build strong muscles? What is the benefit of eating fish? Drinking milk? Where can you find the nutritional information on a food packet? Can you name me some foods which are grown in different countries? Can you tell me about what you have made? Can you evaluate your work during and at the end of the process? What tests did you complete before making improvements? How well does your product meet the needs of the intended user?

Key Vocabulary:
Nutrition, nutrients, energy, proteins, vitamins, sugar, fat, calcium, food label, packaging, grown, countries, continents, safety, hygiene, procedures.

Key Chefs:
Paul Hollywood, Julia Child

Castle View Primary School Design & Technology Curriculum

Year 5 – Food – Celebrating Culture and Seasonality

Prior learning- To understand what nutritional benefits different food types give us; To know where to find the nutritional information on packaging; To know which foods are grown in different countries and continents; To know and follow a range of safety and food hygiene procedures.

National Curriculum Objectives:
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.

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

Cooking and Nutrition
-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

Key Unit Objectives:

Celebrating Culture and Seasonality
To explain how different food and drink provide the nutrients our bodies need to stay healthy and active.
To understand seasonality and the advantages of eating seasonal and locally produced food.
To know that recipes can be adapted to change the appearance, taste and texture.
To know and follow a range of safety and food hygiene procedures.

Research
To explore some existing products- Does the product have any other purpose? How environmentally friendly is the product? How environmentally friendly are the resources?
To evaluate the product on design and use and ease.
To research and find out about famous inventors and designers.

Design
To use market research to inform the design of their product.
To generate, develop, model and communicate their ideas through discussion and annotated sketches.
To use found information (researched) to inform decisions – e.g. time, resources, costs.

Make
To measure and weight ingredients using different scales.
To cook using a heat source e.g. oven with some supervision using the basic functions.
To use a range of cooking techniques e.g. chopping, peeling, grating, slicing, mixing,

Evaluate
To carry out appropriate tests on the product to tests its effectiveness.
To evaluate against original criteria- does it have and is it fit for purpose?
To self-evaluate discussing what does and does not work and to seek evaluation from others.

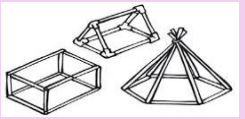
Assessment Questions:
Name two nutrients your body needs and explain why each is important? Why is it better to eat fruit and vegetables that are in season and grown locally? Why is it important to wash fruit and vegetables before eating or cooking them? Can you evaluate your product against your design criteria? What are your strengths and areas for development?

Key Vocabulary:
Seasonaility, local, produce, imported, fresh, environment, adapt, appearance, taste, texture, ingredients, flavour, bacteria, cross- contamination.

Key Chefs:
Gino D'acampo, Edna Lewis

Castle View Primary School Design & Technology Curriculum

Year 5 – Structures – Frame Structures



Prior learning- To know what a shell structure is, To explore/name more sophisticated methods for stiffening and strengthening structures;To know how to and be able to create a shape net. To know how to test a materials strength.

National Curriculum Objectives:
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.

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 to program, monitor and control their products.

Key Unit Objectives:

Frame Structures
To know which materials are best suited to stiffen/ reinforce by selecting them due to their properties.
To know which shapes are the strongest and will support the most weight in a structure.
To know and understand the term triangulation.
To know how to perform simple tests to test the functionality and strength of products.

Research
To explore some existing products- Does the product have any other purpose? How environmentally friendly is the product? How environmentally friendly are the resources?
To evaluate the product on design and use and ease.
To research and find out about famous inventors and designers.

Design
To use market research to inform the design of their product.
To generate, develop, model and communicate their ideas through discussion and annotated sketches.
To use found information (researched) to inform decisions – e.g. time, resources, costs.

Make
To apply knowledge of materials and techniques to refine and rework their product.
To choose the most appropriate resources for the intended outcome and discuss why.

Evaluate
To carry out appropriate tests on the product to tests its effectiveness.
To evaluate against original criteria- does it have and is it fit for purpose?
To self-evaluate discussing what does and does not work and to seek evaluation from others.

Assessment Questions:
Can you tell me which materials you used to make sure your structure was strong? Which shapes are the strongest and will support the most weight in a structure? What is triangulation? How did you test the strength of your structure? Can you evaluate your product against your design criteria? What are your strengths and areas for development?

Key Vocabulary:
Material, property, stiff, flexible, reinforce, strong, suitable, support, base, triangulation, stable, engineer, test, functionality, weight, experiment, result, predict.

Key Designers/ Architects/ Inventors:
James Blyth, Rem Koolhas

Castle View Primary School Design & Technology Curriculum

Year 5 – Textiles – Combining Different Fabric Shapes

Prior learning- To use smaller eyed needles and finer threads to stitch; To practise and use more complex sewing techniques such as cross- stitch to join fabrics together; To use stiches to develop pattern and texture to a piece; To apply decoration to a piece using beads, buttons, feathers.

National Curriculum Objectives:
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.

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

Key Unit Objectives:

Textiles- Combining different fabric shapes
To know how to attach fastenings to their product, which are purposeful e.g. zip, Velcro.
To begin to modify threads and fabrics e.g. tie- die before they make their product.
To use different stitches creatively to produce different patterns and textures e.g. cross stitch.
To understand the need for a seam allowance, when appropriate.

Research
To explore some existing products- Does the product have any other purpose? How environmentally friendly is the product? How environmentally friendly are the resources?
To evaluate the product on design and use and ease.
To research and find out about famous inventors and designers.

Design
To use market research to inform the design of their product.
To generate, develop, model and communicate their ideas through discussion and annotated sketches.
To use found information (researched) to inform decisions – e.g. time, resources, costs.

Make
To apply knowledge of materials and techniques to refine and rework their product.
To choose the most appropriate resources for the intended outcome and discuss why.

Evaluate
To carry out appropriate tests on the product to tests its effectiveness.
To evaluate against original criteria- does it have and is it fit for purpose?
To self-evaluate discussing what does and does not work and to seek evaluation from others.

Assessment Questions:
Can you tell me about the fastening you attached to your product and why? Can you show me/ tell me how you modified your fabric? Can you tell me about the stitch types you have used? Why might you choose a cross stitch instead of a running stitch when decorating fabric? What is a seam allowance? Can you evaluate your product against your design criteria? What are your strengths and areas for development?

Key Vocabulary:
Fastening, zip, Velcro, purposeful, modify, fabric, thread, dye, running and cross stitch, texture, pattern, seam, seam allowance, measure, accurate.

Key Designers/ Architects/ Inventors:
Faith Ringgold, Lucy Sparrow

Castle View Primary School Design & Technology Curriculum

Year 6 – Mechanisms – Pulleys and Gears

Prior learning- To know and understand how to use lever and linkages mechanisms; To know the difference between a fixed and loose pivot; To know how to create guides to control movement.

National Curriculum Objectives:
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.

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
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

Key Unit Objectives:

Pulleys and Gears
To know and understand what a gear and pulley is.
To understand the ratio in a gear or pulley system (how often larger wheels turn in relation to small pulleys or the number of teeth in gears).
To be able to identify gear and pulley mechanisms in everyday objects.

Research
To explore some existing products- does the product have any other purpose? How environmentally friendly is the product? How much does it cost to buy?
To research how much it costs to make the product and to sell the product.
To research and find out about famous inventors and designers.

Design
To use research using surveys to develop a design specification for a product.
To develop a simple design specification to guide the development of their ideas.
To generate and develop innovative ideas and share and clarify these through discussion and annotated sketches and pictorial representations.

Make
To formulate a step by-step plan to guide making, listing tools, equipment, materials etc
To competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials.
To demonstrate problem solving skills when encountering a mistake or problem.

Evaluate
To continually evaluate and modify to match the initial design specification.
To critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.
To test the system to demonstrate its effectiveness for the intended user and purpose.

Assessment Questions:
What is a gear and pulley? Can you tell me about your gear or pulley system? Can you name one everyday object that uses gears? Can you name one everyday object that uses pulleys?
Can you tell me how your product meets your design specification? Does it meet the needs of your intended user? Can you identify some areas for development and its strengths?

Key Vocabulary:
Gear, pulley, wheel, axle, turn/ rotation, ratio, force, speed, lift, mechanisms, gear teeth.

Key Designers/ Architects/ Inventors:
Andrew Smith Hallidie, Renzo Piano

Castle View Primary School Design & Technology Curriculum

Year 6 – Food – Celebrating Culture and Seasonality

Prior learning- To explain how different food and drink provide the nutrients our bodies need to stay healthy and active; To understand seasonality and the advantages of eating seasonal and locally produced food; To know that recipes can be adapted to change the appearance, taste and texture; To know and follow a range of safety and food hygiene procedures.

National Curriculum Objectives:

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.

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

Cooking and Nutrition

-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

Key Unit Objectives:

Celebrating Culture and Seasonality

To understand where food comes from, describing the process of 'farm to fork' .
To understand the environmental impact on future products and cost of production.
To know that a recipe can be adapted by adding or substituting one or more ingredients.
To know and name safety and food hygiene procedures and follow these strictly.

Research

To explore some existing products- does the product have any other purpose? How environmentally friendly is the product? How much does it cost to buy?
To research how much it costs to make the product and to sell the product.
To research and find out about famous inventors and designers.

Design

To use research using surveys to develop a design specification for a product.
To develop a simple design specification to guide the development of their ideas.
To generate and develop innovative ideas and share and clarify these through discussion and annotated sketches and pictorial representations.

Make

To formulate a step by-step plan to guide making, listing tools, equipment, materials etc
To competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials.
To demonstrate problem solving skills when encountering a mistake or problem.

Evaluate

To continually evaluate and modify to match the initial design specification.
To critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.
To test the system to demonstrate its effectiveness for the intended user and purpose.

Assessment Questions:

What does the phrase 'farm to fork' mean? Give me one example of a food and explain the journey it takes from the farm to your plate? What is meant by the term "environmental impact? Why might someone adapt a recipe? Give two reasons. Can you name some safety and food hygiene procedures that you followed? Can you tell me how your product meets your design specification? Does it meet the needs of your intended user? Can you identify some areas for development and its strengths?

Key Vocabulary:

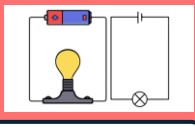
Farm to fork, producer, consumer, harvest, transportation, carbon footprint, seasonal, waste, local produce, organic, substitute, alternative, ingredient, flavour, allergy, intolerance.

Key Chefs:

Mary Berry , Wolfgang Puck

Castle View Primary School Design & Technology Curriculum

Year 6 – Electrical Systems -More complex circuits and switches



Prior learning- To know and understand what an electrical circuit is; To know and understand what a bulb, buzzer and switch is and their functions; To construct a simple series circuit to generate static electricity; To know how to make simple secure connections.

National Curriculum Objectives:
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.

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
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Key Unit Objectives:

More complex circuits and switches
To know how to construct a simple series circuit confidently (building on Y4).
To know different switch types e.g. push to break, push to make, reed and toggle switch.
To know how to test components and assess faults in a series circuit.
To know that mechanical and electrical systems have an input, process and output.

Research
To explore some existing products- does the product have any other purpose? How environmentally friendly is the product? How much does it cost to buy?
To research how much it costs to make the product and to sell the product.
To research and find out about famous inventors and designers.

Design
To use research using surveys to develop a design specification for a product.
To develop a simple design specification to guide the development of their ideas.
To generate and develop innovative ideas and share and clarify these through discussion and annotated sketches and pictorial representations.

Make
To formulate a step by-step plan to guide making, listing tools, equipment, materials etc
To competently select from and use appropriate tools to accurately measure, mark, cut and assemble materials.
To demonstrate problem solving skills when encountering a mistake or problem.

Evaluate
To continually evaluate and modify to match the initial design specification.
To critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests.
To test the system to demonstrate its effectiveness for the intended user and purpose.

Assessment Questions:
Can you tell me how you constructed your circuit? Can you name and describe at least two types of switches? If your circuit doesn't work, how can you find out where the fault is? Can you give an example of a product that uses input, process and output? Can you tell me how your product meets your design specification? Does it meet the needs of your intended user? Can you identify some areas for development and its strengths?

Key vocabulary:
simple series circuit, switch types, push to break, push to make, reed and toggle switch, test components, faults, test, mechanical, electrical, input, process, output.

Key Designers/ Architects/ Inventors:
Richard Rogers