## Design and Technology at Spring Bank Primary School

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## Design and Technology at Spring Bank Primary School

At Spring Bank Primary School, Design and Technology is purposeful, creative and engaging for our children. We offer pupils opportunities to apply and build their imaginative and technical knowledge by designing and making products in a variety of contexts as well as ensuring it is inclusive for all of our pupils. Design and Technology is taught for three half terms per year, alternating with Art and Design.

DT units are categorised into the following areas in KS1 and KS2: Structures, mechanisms, food technology, textiles and electrical systems (only taught in upper KS2). Within the EYFS, DT comes within the 'PSED and Expressive Arts and Design' area of development.

The units are centered on the 'Design, Make, Evaluate' cycle:
Design: Children explore, develop and share their ideas. They discuss and break down a design criteria or design brief and think about what they want to create and achieve. Children plan and design based on testing, prototypes and applying their developing technical knowledge.

Make: Children build their design by making choices linked to materials, product function and final outcomes. Children revisit and refine their skills; measure, cut, join \& assemble.

Evaluate: Children critically evaluate their product by questioning and testing. What makes their product successful and how could it be improved? This is an important step - children reflect and learn from the process.

## Overview of Units

An overview of units is provided for teachers to understand the progress of units throughout the school. The units are broken down into: structures, mechanisms, food technology, textiles and electrical systems and digital world.

|  | Reception | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Autumn Term |  |  | Mechanics - making a moving vehicle wheels and axles |  |  |  |  |
|  | Mechanisms making vehicles | Free standing structures. E.g. a toy garage. |  | Shell structures - e.g. a sandwich box. | Electrical control design a Christmas card that has a simple circuit and is controlled by a switch. | Mechanical systems - CAM mechanisms linked to Space. | Electrical Systems Monitoring and Control - alarm. |
| Spring Term | Nutrition - Design and make a pizza |  | Nutrition - healthy sandwiches and sorting foods into the five groups and five portions of fruit \& veg. | Mechanical systems levers and linkages flags. |  |  |  |
|  | Castles | Designing a moving picture - sliders and levers. |  |  | Nutrition - Design and make a salsa. | Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed. Cook savoury meals using local or Fair Trade produce. | Design and evaluate a carnival costume combining different fabric shapes. |
| Summer Term | Free Standing structures - design a barn for animals on the farm. | Nutrition - designing a fruit salad. |  |  |  |  |  |
|  | Textiles - sew two prepared fabric pieces together butterflies. |  | Textiles - seaside designs, beach bags etc. | Nutrition - grow it/eat it food projects. | Textiles project Combining shapes to make a pin cushion or money wallet. | Bridge structures bridge architects. | Digital World - <br> Navigating the world |

## Design and Technology Age Related Expectations - Knowledge and design skills

This document lays out an overview of the Design and Technology that is taught across school from Reception to Year 6. This includes the EYFS statutory framework for 'Expressive Arts and Design' and the knowledge and design skills from the National Curriculum that must be taught in KS1 and KS2. The programmes of study have been broken down into key knowledge, to support the teaching and learning of each topic. Key vocabulary, for each topic, that will be taught and used by the children in their learning is in bold.

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

The knowledge below has been written in the following order:
Structures
Mechanisms
Food technology
Textiles
Electrical systems
Digital World

## Structures

## Reception - Constructing farm sets

## Early Learning Goal:

Creating with Materials
Children at the expected level of development will:

- 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
- Make use of props and materials when role playing characters in narratives and stories


## Supporting Materials from EYFS Development Matters:

- Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park
- Explore different materials freely, to develop their ideas about how to use them and what to make
- Develop their own ideas and then decide which materials to use to express them
- Join different materials and explore different textures
- Return to and build on their previous learning, refining ideas and developing their ability to represent them
- Create collaboratively, sharing ideas, resources and skills


## Knowledge and design skills:

- We can build models using lots of different resources
- Blocks and resources that have a flat face are best for stacking
- We can design things before we make them
- Certain resources can look like different parts of a structure. E.g. a rectangle block being a door, a square block being a window, a circle being a pond


## Reception - Castles

## Early Learning Goal:

## Creating with Materials

Children at the expected level of development will:

- 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
- Make use of props and materials when role playing characters in narratives and stories


## Supporting Materials from EYFS Development Matters:

- Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park
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- Join different materials and explore different textures
- Return to and build on their previous learning, refining ideas and developing their ability to represent them
- Create collaboratively, sharing ideas, resources and skills


## Knowledge and design skills:

- We can recycle and use junk modelling materials to make something
- We can see 2 D and 3 D shapes with the resources we are using
- How to attach different parts together: e.g. gluing and sticking, stapling, tape
- Some materials can be moulded into objects. E.g. manipulating tin foil so it looks like a sword


## Year 1-Playground

## National Curriculum:

Pupils 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

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


## Knowledge:

- A freestanding structure is a structure that stands on its own foundation or base without attachment to anything else.
- Shapes and structures with wide, flat bases or legs are the most stable.
- The shape of a structure affects its strength.
- Materials can be manipulated to improve strength and stiffness.
- A structure is something which has been formed or made from parts.
- A 'stable' structure is one which is firmly fixed and unlikely to change or move.


## In this topic children will:

Design, make and evaluate playgrounds or toy garages as part of their toys topic. They will learn how to build the structure and explore how it can be made stronger stiffer and more stable.

## DESIGN

- Learning the importance of a clear design criteria.
- Including individual preferences and requirements in a design
- Generating and communicating ideas using sketching and modelling.
- Learning about different types of structures, found in the natural world and in everyday objects.
- A 'strong' structure is one which does not break easily.
- A 'stiff' structure or material is one which does not bend easily.
- Different materials can be added to help reinforce structures
- There are different ways you can assemble frame structures. They could be made from materials such as wood, cardboard, paper, metal or plastic.
- Different materials can be added to help reinforce structures.
- Some frame structures are used to protect things - a roof can be a frame structure - or to hold things, such as a milk carton or egg box.
- Making stable structures from card, tape and glue
- Learning how to turn 2D nets into 3D structures.
- Making a structure according to design criteria.
- Creating joints and structures from paper/card and tape. Building a strong and stiff structure by folding paper.


## EVALUATE

- Evaluating a windmill according to the design criteria
- testing whether the structure is strong and stable and altering it if it isn't.
- Suggest points for improvements.


## Year 3-Boxes

## 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


## In this topic children will:

Study a range of shell structures and explore how to make 3D shapes from 2D nets. They will design, make and evaluate their own boxes using computer assisted design to support the design process.

- 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


## Knowledge:

- A shell structure is a hollow structure made from a thin outer layer.
- To know that a paper net is a flat 2D shape that can become a 3D shape once assembled.
- To know that a design specification is a list of success criteria for a product
- To know that aesthetics are how a product looks.
- To know that a product's function means its purpose and that it has to be suitable for what it contains.
- To understand that the target audience means the person or group of people a product is designed for
- Graphic Designers use computer assisted design (CAD) to design packaging.
- Complex structures can be stiffened and reinforced using different materials and techniques.
- To know what materials are suitable and which are not for making boxes.


## Year 5-Bridges

## 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,

## In this topic children will:

Learn about three different types of bridge and the materials used to build them. Using readily-available materials such as card, paper or art straws, children will explore ways in which forces act on bridge structures, how they are constructed and

## 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


## Knowledge:

- A bridge is a structure built to carry a load.
- Building pillars allowed bridge builders to span bigger gaps
- To understand some different ways to reinforce structures using beams
- To understand how trusses can be used to reinforce bridges
- Lattice truss, warren truss and pratt truss are different types of trusses used.
- To understand why material selection is important based on properties wood is strong and flexible but would rot in water.
- To understand the difference between arch, truss and suspension bridges.
- Architects produce prototype bridges when designing new products
how they are strengthened. They will work as a team to design, make and evaluate different bridges before designing and making their own prototype.


## DESIGN

- Designing a stable structure that is able to support weight.
- Creating a frame structure with a focus on triangulation


## MAKE

- Making a range of different shaped beam bridges.
- Using triangles to create truss bridges that span a given distance and support a load.
- Independently measuring and marking materials accurately.
- Selecting appropriate tools and equipment for particular tasks.
- Using the correct techniques to saw safely.
- Identifying where a structure needs reinforcement and using card corners for support.
- Explaining why selecting appropriating materials is an important part of the design process.


## EVALUATE

- Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary.
- Suggesting points for improvements for own bridges and those designed by others.


## MECHANISMS

## Reception - Junk modelling transport vehicles

## Early Learning Goal:

## Creating with Materials

Children at the expected level of development will:

- 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
- Make use of props and materials when role playing characters in narratives and stories


## Supporting Materials from EYFS Development Matters:

- Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park
- Explore different materials freely, to develop their ideas about how to use them and what to make
- Develop their own ideas and then decide which materials to use to express them
- Join different materials and explore different textures
- Return to and build on their previous learning, refining ideas and developing their ability to represent them
- Create collaboratively, sharing ideas, resources and skills


## Knowledge and design skills:

- We can recycle and use junk modelling materials to make something
- We can see 2D and 3D shapes with the resources we are using
- How to attach different parts together: e.g. gluing and sticking, stapling, tape


## Year 1-Designing a moving picture

## 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

## In this topic children will:

Investigate different sliders and levers in moving pictures and learn how to create their own mechanisms. Using the skills that they have learnt design, create and evaluate a moving picture.
example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].
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


## 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.


## Knowledge:

## Sliders and levers can be used to create movement in a picture.

- To know that a mechanism is the parts of an object that move together.
-To know that a slider mechanism moves an object from side to side.


## DESIGN

- Explaining how to adapt mechanisms, using bridges or guides to control the movement.
- To know that a slider mechanism has a slider, slots, guides and an object
. Know that the parts that move in a picture are usually characters or objects, not the background.
- To know that guides are bits of card that purposefully restrict the movement of the slider.
- To know that in Design and Technology we call a plan a design.


## MAKE

- Following a design to create moving models that use levers and sliders.
- Fasten card and split pins together to make levers and sliders
- Use scissors safely


## EVALUATE

- Testing a finished product, seeing whether it moves as planned and if not, explaining why and how it can be fixed.
- Reviewing the success of a product by testing it with its intended audience.


## Year 2 - Making a moving vehicle

## National Curriculum

## 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


## In this topic children will:

Learn how to create a rotating axle and evaluate a range of moving vehicles to come up with a design for their own vehicle. Children will use the materials available to create a functioning moving vehicle.

## Knowledge:

To know that wheels need to be round to rotate and move.

- To understand that for a wheel to move it must be attached to a rotating axle.
- To know that an axle moves within an axle holder which is fixed to the vehicle or toy.
- To know that the frame of a vehicle (chassis) needs to be balanced.


## DESIGN

- Designing a vehicle that includes wheels, axles and axle holders, that when combined, will allow the wheels to move.
- Creating clearly labelled drawings that illustrate movement


## MAKE

- Use dowling, a range of wheels, plastic tubing and foam stops to make a rotating axle
- Use scissors and glue safely.
- Combine a range of materials to make a finished design.
- Adapt mechanisms, when they they do not work as they should. to fit their vehicle design and to improve how they work after testing their vehicle.


## EVALUATE

- Testing wheel and axle mechanisms, identifying what stops the wheels from turning, and recognising that a wheel needs an axle in order to move.


## Year 3 - Weather posters

## 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


## In this topic children will:

Investigate levers and linkages and apply their learning to designing a weather poster. They will use readily available materials to create and evaluate their own designs with a working linkage mechanism.

- 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]


## Knowledge:

- To know that mechanisms are a collection of moving parts that work together to produce movement.
- To know that there is always an input and output in a mechanism.
- To know that an input is the energy that is used to start something working.
- To know that an output is the movement that happens as a result of the
- To know that a lever is something that turns on a pivot.
- To know that a linkage mechanism is made up of a series of levers.


## DESIGN

- Designing a
- Developing design criteria from a design brief.
- Generating ideas using thumbnail sketches and exploded diagrams.
- Learn that different types of drawings are used in design to explain ideas clearly.


## MAKE

- Making linkages using card for levers and split pins for pivots.
- Experimenting with linkages adjusting the widths, lengths and thicknesses of card used. •
- Cutting and assembling components neatly.


## EVALUATE

- Using the views of others to improve designs.
- Testing and modifying the outcome, suggesting improvements.
- Understanding the purpose of exploded-diagrams through the eyes of a designer and their client.


## Year 5-Automata Toys

## 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

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


## Knowledge

- To know that an automata is a hand powered mechanical toy.


## In this topic children will:

Investigate automata toys with moving cam mechanisms. 0

- Investigating different types of cam mechanisms
- Identify the purpose and functions of cam mechanisms
- Investigating ways of strengthening structures for a moving toy
- Design and plan a moving toy using the topic theme Space for inspiration
- Follow a plan to make a moving toy with a cam mechanism
- Evaluate their own moving toy


## DESIGN

- Experimenting with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement.
- To understand that the mechanism in an automata uses a system of cams, axles and followers.
- To understand that different shaped cams produce different outputs.
- A cam mechanism is made up of 3 components: cam, slider and follower
- To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.
- To know that a cross-sectional diagram shows the inner workings of a product.
- Understanding how linkages change the direction of a force.
- Making things move at the same time.
- Understanding and drawing cross-sectional diagrams to show the innerworkings of the design.


## MAKE

- Measuring, marking and checking the accuracy of the dowel pieces required.
- Measuring, marking and cutting components accurately using a ruler and scissors.
- Assembling components accurately to make a stable frame.
- Selecting appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.


## EVALUATE

- Evaluating the work of others and receiving feedback on own work.
- Applying points of improvement to their toys.
- Describing changes they would make/do if they were to do the project again.


## Cooking and Nutrition

## Reception - Design and make a pizza

## Early Learning Goal:

## Managing Self

Children at the expected level of development will:

- Understand the importance of healthy food choices

Creating with Materials
Children at the expected level of development will:

- 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


## Knowledge and design skills:

- We can design things before we make them
- Know that we can categorise food by whether it is healthy or unhealthy
- Know that some food can be unhealthy if we consume too much of it
- Know that pizzas are an Italian food


## Supporting Materials from EYFS Development Matters:

- Make healthy choices about food, drink, activity and toothbrushing
- Know and talk about the different factors that support their overall health and wellbeing
- Explore different materials, using all their senses to investigate them
- Create collaboratively, sharing ideas, resources and skills


## - Start to know that there are different categories of food

- We can evaluate things after we have made them, and decide what to change next time


## Year 1 - Fruit Salads

## National Curriculum:

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.


## Knowledge:

- Know that fruit and vegetables are grown from plants
- Know that fruits have seeds and vegetables do not and that fruits grow on trees or vines.
- To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).
- These foods help to keep us healthy and we should have at least 5 portions of these a day as part of a balanced diet.
- A recipe is a set of instructions which tell you how to make a dish
- The ingredients are the fruits which are put together to make a salad.


## In this topic children will:

Begin to learn about healthy foods and how we prepare them. The children will design, make and evaluate their own fruit salads.

## DESIGN

- Create a recipe for a healthy fruit salad or smoothie, considering the taste, texture, smell and appearance


## MAKE

- Wash hands and tie long hair back
- Ensure the food area is clean
- Prepare the fruit in the following ways:

Wash - wash the fruit with water if the skin is being eaten
Peel - take the outside skin off
Grate - use a grater to create small strips
Cut - use a knife to make the food smaller

- When cutting food we use 2 different methods to keep our fingers safe:

Bridge - make a bridge with thumb and finger to hold the food. Hold the other fingers up high. The knife travels through the bridge onto the top of the food Claw - put thumb against palm and push the tips of the fingers into the food. Lean your fingers slightly over the nails so that we don't catch the tip of the fingers.

## EVALUATE

- Tasting and evaluating different food combinations.
- Describing appearance, smell and taste.


## New skills:

- Using a bridge knife technique
- Using a claw knife technique
- Using measuring equipment such as spoons and cups
- Using balance scales
- Beating ingredients together
- Prepare ingredients correctly - e.g. washing and peeling


## Food hygiene and safety:

- I can get ready to cook with some help:
- Tie back long hair
- Roll up long sleeves
- Remove any jewellery, including watches
- Put on an apron
- Wash my hands
- I can give some examples of foods which should be kept in the fridge, freezer or cupboard.


## Year 2 - Healthy sandwiches

## National Curriculum:

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.


## Knowledge:

- To know that 'diet' means the food and drink that a person or animal usually eats.
- To understand what makes a balanced diet.
- To know where to find the nutritional information on packaging.
- To know that nutrients are substances in food that all living things need to make energy, grow and develop.
- To know that 'ingredients' means the items in a mixture or recipe.
- To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.
- There are 5 food groups (fruits and vegetables, carbohydrates, fats and oils, dairy, proteins)
- A healthy diet can be achieved by eating the right balance of foods from each of these food groups
- Our food comes from plants or animals. Food needs to be farmed and produced


## In this topic children will:

Use their knowledge of the 5 food groups to design a 'super healthy' sandwich. Children will design their sandwich, choose their ingredients and follow the method to make their sandwich. Children will learn about food hygiene and food safety then use this knowledge when preparing their sandwiches.

## DESIGN

- Design a healthy sandwich/wrap based on a food combination that works well together.


## MAKE

- Slicing food safely using the bridge or claw grip.
- Constructing a sandwich/wrap that meets a design brief.


## EVALUATE

- Describing the taste, texture and smell of fruit and vegetables.
- Taste testing food combinations and final products.
- Describing the information that should be included on a label.
- Evaluating which grip was most effective


## New skills:

- Grating soft foods such as cheese
- Arranging ingredients/toppings
- Spreading with a table knife, e.g. butter
- Garnishing and decorating


## Consolidated skills:

- Using a bridge knife technique
- Using a claw knife technique
- Prepare ingredients correctly - e.g. washing and peeling


## Food hygiene and safety:

- I can get ready to cook with some help:
- Tie back long hair
- Roll up long sleeves
- Remove any jewellery, including watches
- Put on an apron
- Wash my hands
- I can give some examples of foods which should be kept in the fridge, freezer or cupboard.


## Year 3 - Grow it, Eat it!

## National Curriculum:

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


## In this topic children will:

Learn how to follow a recipe to cook and adapt a savoury recipe such as herby scones, savoury tart, savoury muffin using herbs grown in Science. They will learn new cooking techniques to make the dish and will evaluate their finished dish.

## Knowledge:

- To know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.
- To understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.
- To know that similar coloured fruits and vegetables often have similar nutritional benefits
- To know that cooking instructions are known as a 'recipe
- know that the amount of an ingredient in a recipe is known as the 'quantity.'.
- To know safety rules for using, storing and cleaning a knife safely.
- To know the following cooking techniques: sieving, creaming, rubbing method, cooling.


## New skills:

- Tearing, snipping and chopping herbs
- Using a jug to measure liquids
- Use digital scales
- Sieving flour
- Cracking an egg
- Beating an egg
- Adding liquid to flour
- Dividing mixture into tins
- Kneading dough
- Spooning ingredients into different containers


## Consolidated skills:

- Using a bridge knife technique
- Using a claw knife technique
- Using measuring equipment such as spoons and cups
- Prepare ingredients correctly - e.g. washing and peeling


## DESIGN

- Create a healthy and nutritious recipe for a savoury tart/scones/savoury muffin using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.


## MAKE

- Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.
- Following the instructions within a recipe.
- Cooking safely, following basic hygiene rules.
- Adapt a recipe to improve it or change it to meet new criteria


## EVALUATE

- Establish and using design criteria to help test and review dishes.
- Describe the benefits of seasonal fruits and vegetables and the impact on the environment.
- Suggest points for improvement when making a seasonal dish.


## Food hygiene and safety:

- I can get myself ready to cook and remember what I need to do:
- Tie back long hair
- Roll up long sleeves
- Remove any jewellery, including watches
- Put on an apron
- Wash my hands
- I know that there are storage instructions on most food packaging and I can identify and use these.
- I know that different food should be stored in different places in the fridge to keep it at its best and prevent cross contamination.
- I know that leftover food must be covered and stored correctly and eaten in an appropriate time frame.
- I can explain that foods not stored correctly can spoil and decay due to the action of micro-organisms, insects and other pests.


## Year 4-Salsa

## National Curriculum:

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


## Knowledge:

- know that the amount of an ingredient in a recipe is known as the 'quantity.'
- To know the following cooking techniques: mixing, seasoning, crushing


## New skills:

- Peeling soft vegetables
- Crushing garlic
- Seasoning to taste
- Spooning ingredients using 2 spoons


## In this topic children will:

Learn how to follow a recipe to cook and adapt a salsa recipe. They will learn new cooking techniques to make the dish and will evaluate their finished dish.

## DESIGN

- Designing a salsa, drawing upon previous taste testing judgement


## MAKE

- Cut and prepare vegetables safely.
- Use equipment safely, including knives,
- Know how to avoid cross-contamination.
- Follow a step by step method carefully to make a recipe.
- Follow a recipe, including using the correct quantities of each ingredient.
-Adapt a recipe based on research.


## EVALUATE

- Evaluate a recipe, considering: taste, smell, texture and appearance.

Evaluate and compare a range of food products.

- Suggest modifications to a recipe

Food hygiene and safety:

## Consolidated skills:

- Using a bridge knife technique
- Using a claw knife technique
- Tearing, snipping and chopping herbs
- Using measuring equipment such as spoons and cups
- Beating ingredients together
- Use digital scales
- Prepare ingredients correctly - e.g. washing and peeling
- Spooning ingredients into different containers
- I can get myself ready to cook and remember what I need to do:
- Tie back long hair
- Roll up long sleeves
- Remove any jewellery, including watches
- Put on an apron
- Wash my hands
- I know that there are storage instructions on most food packaging and I can identify and use these.
- I know that different food should be stored in different places in the fridge to keep it at its best and prevent cross contamination.
- I know that leftover food must be covered and stored correctly and eaten in an appropriate time frame.

I can explain that foods not stored correctly can spoil and decay due to the action of micro-organisms, insects and other pests.

## Year 5 - Food for Thought

## National Curriculum:

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


## In this topic children will:

Learn about which foods are in season in the UK. They will design their own dish based on a recipe using seasonal foods. They will prepare the meal using a range of cooking techniques and evaluate it.

## Knowledge:

- To know that not all fruits and vegetables can be grown in the UK.
- To know that climate affects food growth.
- To know that vegetables and fruit grow in certain seasons.
- To know that imported food is food which has been brought into the country.
- To know that exported food is food which has been sent to another country.
- To understand that imported foods travel from far away and this can negatively impact the environment.
- Food can be grown, reared, caught and processed


## New skills:

- Grating harder foods such as a carrot
- Peeling potatoes
- Using cooking equipment such as pans and hobs with adult supervision


## DESIGN

- Adapt a traditional recipe, understanding that the nutritional value of a recipe alters if you remove, substitute or add additional ingredients.
- Write an amended method for a recipe to incorporate the relevant changes to ingredients.
- Write a recipe, explaining the key steps, method and ingredients


## MAKE

- Cut and prepare vegetables safely.
- Use equipment safely, including knives, hot pans and hobs.
- Know how to avoid cross-contamination.
- Follow a step by step method carefully to make a recipe, including using the correct quantities of each ingredient.
- Adapt a recipe based on research.
- Work to a given timescale.
- Working safely and hygienically with independence.


## EVALUATE

- Evaluate a recipe, considering: taste, smell, texture and origin of the food group.
- Taste test and score final products.
- Suggest and write up points of improvements when scoring others' dishes, and when evaluating their own throughout the planning, preparation and cooking process.
- Evaluate health and safety in production to minimise cross contamination.


## Food hygiene and safety:

- I can get myself ready to cook and talk about and demonstrate what I should do during and after I cook:
- Tie back long hair
- Roll up long sleeves
- Remove any jewellery, including watches
- Put on an apron
- Wash my hands
- Keep my work space tidy
- Avoid touching my face and hair
- Wash up the equipment


## Consolidated skills:

- Using a bridge knife technique
- Using a claw knife technique
- Tearing, snipping and chopping herbs
- Peeling soft vegetables
- Grating soft foods
- Kneading to make a dough
- Using measuring equipment such as spoons and cups
- Adding ingredients/toppings
- Crushing garlic
- Prepare ingredients correctly - e.g. washing and peeling
- Clean the surfaces
- I know that there are date marks ('use by' and 'best before') on foods and I can identify and use these.
- I know that different food should be stored in different places in the fridge to keep it at its best and prevent cross contamination.
- I know that leftover food must be covered and stored correctly and eaten in an appropriate time frame.
- I can explain that foods not stored correctly can spoil and decay due to the action of micro-organisms, insects and other pests.


## Textiles

## Reception - Butterflies

## Early Learning Goal:

## Creating with Materials

Children at the expected level of development will:

- 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
- Make use of props and materials when role playing characters in narratives and stories


## Supporting Materials from EYFS Development Matters:

- Explore different materials freely, to develop their ideas about how to use them and what to make
- Develop their own ideas and then decide which materials to use to express them
- Join different materials and explore different textures
- Return to and build on their previous learning, refining ideas and developing their ability to represent them
- Explore, use and refine a variety of artistic effects to express their ideas and feelings
- Create collaboratively, sharing ideas, resources and skills


## Knowledge and design skills:

- We can design things before we make them
- Know how to thread a needle
- Know how to sew through the holes in materials to sew to pieces of fabric together
- We can evaluate things after we have made them, and decide what to change next time


## Year 2 - Beach bag

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]. 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


## Knowledge:

- To know that sewing is a method of joining fabric.
- Canvas is a material that can be used to create a bag
- Bags can be made using canvas sheets. These are sewn together using a running stitch
-     - To understand the importance of tying a knot after sewing the final stitch.
- To know that a thimble can be used to protect fingers when sewing.
- Existing products are decorated in a variety of ways. One of these ways is using applique
- Handles can be attached to the bag using a running stitch
- All of the stitches must be secure in order for the bag to function well

Evaluate existing products to create a beach bag. Children will learn how to sew using a running stitch and will piece two canvas pieces of fabric together to make a bag. This bag will then be decorated using fabric crayons or fabric paints.

## DESIGN

- State what product they are designing and making.
- Say whether their bag is for themselves or other users.
- Describe what the bag is for.
- Say how the bag will work.
- Say how they will make their bag suitable for the intended user.
- Create an appealing design to go onto a beach bag.

MAKE

- Plan by pinning two pieces of fabric together and saying what needs to happen next.
- Select from needles and embroidery thread to sew and know why they are sewing using canvas.
- Use a running stitch to sew, with evenly spaced, neat, even stitches to join fabric
- Thread a needle with some support
- Follow safety procedures when sewing with a needle.
- Measure, mark out and cut out the handles for the bag.
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- Using finishing techniques with fabric pens or paints.


## EVALUATE

- Talk about their design ideas and what they are making.
- Evaluate the quality of the stitching on others' work.
- Discuss as a class the success of their stitching against the design criteria.
- Identify aspects of their peers' work that they particularly like and explain why.
- Suggest how their bag could be improved


## Year 4 - Cushions

## 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


## In this topic children will:

Evaluate a range of cushions and design their own. They will learn the skill of applique to decorate their cushions and then produce and evaluate their own designs.

## Knowledge:

- To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces.
- To know that when two edges of fabric have been joined together it is called a seam.
- To know that it is important to leave space on the fabric for the seam.
- To understand that some products are turned inside out after sewing so the stitching is hidden


## DESIGN

- Gather information about the needs and wants of particular individuals and groups when designing a cushion
- Design and make a template from an existing cushion and applying individual design criteria.
- Make design decisions which take into account the availability of resources.


## MAKE

- Order the stages of making a cushion.
- Follow design criteria to create a cushion
- Select and cut fabrics with ease using fabric scissors.
- Thread needles and tie knots with greater independence
- Sew a seam with wrong sides facing and turn out when finished
- Decorate fabric using appliqué.
- Complete design ideas with stuffing


## EVALUATE

- Investigate and analyse a range of cushions - where and when they were made and whether they can be recycled or reused.
- Testing and evaluate an end product against the original design criteria.
- Decide how many of the criteria should be met for the product to be considered successful.
- Suggest modifications for improvement.


## Year 6 - Carnival costume

## 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


## In this topic children will:

Learn about the history of Carnival and the different costume designs which make up the carnival tradition in other cultures. They will design and make their own carnival costumes for an intended user and will present and evaluate their designs.

- 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


## Knowledge:

To understand that it is important to design costumes with the client/ target customer in mind.

- To know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.
- To understand the importance of consistently sized stitches.


## DESIGN

- Carry out a survey using web based resources of popular carnival costumes in the Leeds Carnival.
- Use that information to identify the needs, wants, preferences and values of a particular individual or group.
- Design a carnival costume in accordance to a specification linked to the design criteria that also considers time, resources and costs.
- Annotate designs, to explain their decisions.


## MAKE

- Produce an appropriate list of tools, equipment and materials that they need to make their carnival costume.
- Create a step-by-step plan as a guide to making their costume.
- Use a template when cutting fabric to ensure they achieve the correct shape.
- Use pins effectively to secure a template to fabric without creases or bulges.
- Measure, mark and cut fabric accurately, in accordance with their design.
- Learn how to use different decorative stitches.
- Sew a strong running stitch, making small, neat stitches and following the edge.
- Sew accurately with evenly spaced, neat stitches.
- Tie strong knots.
- Decorate the costume, attaching features (such as feathers and sequins) using thread.
- Finish the costume with a secure fastening (such as buttons).


## EVALUATE

- Critically evaluate and reflect on the quality of their work throughout the design, make and evaluate process.
- Evaluate their ideas and costume against the original design criteria.
- Investigate and analyse a range of carnival costumes - including the cost to make, the sustainability of the products and what impact the products have beyond their intended purpose.
- Investigate and analyse a range of cushions - where and when they were made and whether they can be recycled or reused.


## Electrical Systems (KS2 Only)

## Year 4 - Design a Christmas card

## 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


## In this topic children will:

Evaluate existing products and use their knowledge and understanding gained in Science to design, make and evaluate a light-up Christmas card which is controlled by a switch.

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


## Knowledge:

To understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit.

- To understand that an electric product uses an electrical system to work


## (function).

- To know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits.
- To understand that electrical conductors are materials which electricity can pass through.
- To understand that electrical insulators are materials which electricity cannot pass through.
- To know that a battery contains stored electricity that can be used to power products.
- To know that an electrical circuit must be complete for electricity to flow.
- To know that a switch can be used to complete and break an electrical circuit.


## DESIGN

- Design a light-up Christmas card through a drawn and labelled diagram
- Explore and evaluate existing designs
- Engage in product research for the target audience
- Generate their own ideas for an intended audience using research
- Draw detailed diagrams of how their design and circuit will look together.


## MAKE

- Select and use appropriate tools and materials
- Create an electrical system in their product which must include: a switch, bulb, to create a working circuit
- Use appropriate well-chosen materials
- Use appropriate tools effectively


## EVALUATE

- Learning to give and accept constructive criticism on own work and the work of others.
- Testing the success of initial ideas against the design criteria and justifying opinions.
- Revisiting the requirements of the client to review developing design ideas and check that they fulfil their needs.


## Year 6 - Monitoring and control - Alarms

## 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].

## In this topic children will:

- Drawing on science understanding to explore a range of electrical systems that could be used to control their products, including a simple series circuit where a single output device is controlled, a series circuit where two output devices are controlled by one switch and, where appropriate, parallel circuits where two output devices are controlled independently by two separate switches. They will practise


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


## Knowledge:

- Understand the use of computer control systems in products.
- Apply their understanding of computing to program, monitor and control their products.
- Know and use technical vocabulary relevant to the project.
methods for making secure electrical connections e.g. using wire strippers, twist and tape connections, screw connections, crocodile clips and connecting blocks. They will write and modify computer control programs that include inputs, outputs and decision making and test out the programs using electrical components connected to microcontrollers, interface boxes or standalone boxes.


## DESIGN

- Develop a design specification for a functional product that responds automatically to changes in the environment.
- Generate, develop and communicate ideas through discussion, annotated sketches and pictorial representations of electrical circuits or circuit diagrams.
- Formulate a step by step plan to guide making listing tools, equipment, materials and components.
- Competently select and accurately assemble materials, and securely connect electrical components to produce a reliable, functional product.
- Create and modify a computer control program to enable their electrical product to respond to changes in the environment.


## EVALUATE

- Continually evaluate and modify the working features of the product to match the initial design specification.
- Test the system to demonstrate its effectiveness for the intended user and purpose.


## Digital World (KS2 only)

## Year 6 - Navigating the World

## 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


## In this topic children will:

Children learn how to create design criteria to fulfil a client's brief. They learn how to program a navigation tool, combining multiple functions to fulfil the brief and pitch their design to their client.

- 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]
- apply their understanding of computing to program, monitor and control their products.


## Knowledge:

- To know that accelerometers can detect movement.
- To understand that sensors can be useful in products as they mean the product can function without human input.
- To know that designers write design briefs and develop design criteria to enable them to fulfil a client's request.
- To know that 'multifunctional' means an object or product has more than one function.
- To know that magnetometers are devices that measure the Earth's magnetic field to determine which direction you are facing.


## DESIGN

- Write a design brief from information submitted by a client.
- Develop design criteria to fulfil the client's request.
- Consider and suggesting additional functions for my navigation tool.
- Develop a product idea through annotated sketches.
- Place and manoeuvre 3D objects, using CAD.
- Change the properties of, or combining one or more 3D objects, using CAD


## MAKE

- Consider materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo).
- Explain material choices and why they were chosen as part of a product concept.
- Program an N,E, S, W cardinal compass.


## EVALUATE

- Explain how my program fits the design criteria and how it would be useful as part of a navigation tool.
- Developing an awareness of sustainable design.
- Identify key industries that utilise 3D CAD modelling and explaining why. •
- Describe how the product concept fits the client's request and how it will benefit the customers.
- Explain the key functions in my program, including any additions.

|  | Explain how my program fits the design criteria and how it would be useful <br> as part of a navigation tool. <br> Explain the key functions and features of my navigation tool to the client as <br> part of a product concept pitch. <br> Demonstrate a functional program as part of a product concept pitch. |
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## Leading Designers

Each year group has a designer that they will introduce to the children each year.

| Year Group | Unit | Name | Job Role | Description |
| :--- | :--- | :--- | :--- | :--- |
| Reception | Nutrition (Spring) | Gino D'Acampo | Chef | Gino D'Acampo is an Italian chef who <br> is best known for food-focused <br> television shows and cookbooks. |
| Year 1 | Structures (Autumn) | Ole Kirk Kristiansen | Carpenter | Ole Kirk Kristiansen was a Danish <br> carpenter. In 1932, he founded the <br> construction toy company, 'Lego'. |
| Year 2 | Mechanisms (Autumn) | Hideo Shima | Mechanical <br> Engineer | Hideo Shima was a Japanese engineer <br> and the driving force behind the <br> building of the first bullet train. |
| Year 3 | Structures (Autumn) |  | Graphic <br> Designer | TB to look at. |
| Year 4 | Textiles (Summer) | Orla Kiely | Textile artist | Orla Kiely is an Irish fashion designer <br> who has designed hats, handbags and <br> a variety of other items including <br> kitchenware. |


| Year 5 | Structures (Summer) | Isambard Kingdom <br> Brunel | Civil Engineer | Isambard Kingdom Brunel is a British <br> civil engineer who is most famous for <br> designing bridges, railway and ships - <br> including the design and construction <br> of the Thames Tunnel. |
| :--- | :--- | :--- | :--- | :--- |
| Year 6 | Textiles (Spring) | Hughbon Condor | Costume <br> Designer | Hughbon Condor is a carnival <br> costume designer who has been <br> closely associated with the Leeds <br> West Carnival for many years. |

