St Augustine's Long Term Plan - Design and Technology Intent

Design and Technology Cycle B

EYFS Prerequisite Skills for Design and Technology from Development Matters and Early Learning Goals

EYFS						
	Advent 1	Advent 2	Lent 1	Lent 2	Pentecost 1	Pentecost 2
F1	Me and My Family	Light and Dark (colours)	People Who Help Us	Growing	Creepy Crawlies and Minibeasts	At the Farm
F2	Myself and My Super Power	Castles and Knights (fairy tales)	Space	Dinosaurs	Transport	Animals

EYFS	Personal, Social and Emotional Development	Physical Development	Understanding the world	Expressive Arts and Design
DM F1	• Select and use activities and resources, with help when needed. This helps them to achieve a goal they have chosen or one which is suggested to them.	• Use large-muscle movements to wave flags and streamers, paint and make marks. • Choose the right resources to carry out their own plan. • Use one-handed tools and equipment, for example, making snips in paper with scissors.	• Explore how things work.	• 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, in order 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. • Create closed shapes with continuous lines, and begin to use these shapes to represent objects.
DM F2		• Progress towards a more fluent style of moving, with developing control and grace. • Develop their small motor skills so that they can use a range of tools competently, safely and confidently. • Use their core muscle strength to achieve a good posture when		• Explore, use and refine a variety of artistic effects to express • their ideas and feelings. • Return to and build on their previous learning, refining ideas • and developing their ability to represent them.

		sitting at a table or sitting on the floor.		• Create collaboratively, sharing ideas, resources and skills.
ELG		**Fine Motor Skills** • Use a range of small tools, including scissors, paintbrushes and cutlery.		**Creating with Materials** • Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. • Share their creations, explaining the process they have used.

Year 1/2 Cycle B	**Advent 1**	**Lent 1**	**Pentecost 1**
Topic	**Mechanisms** **Fairgrounds** **(History-Goose Fair)**	**Structures** **Baby Bears Chair.**	**Textiles** **Puppets**
National Curriculum	**Design** • Design purposeful, functional, appealing products for themselves and other users based on a 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]. **Evaluate** • Explore and evaluate a range of existing products.	**Design** • Design purposeful, functional, appealing products for themselves and other users based on a 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]. **Evaluate** • Explore and evaluate a range of existing products.	**Design** • Design purposeful, functional, appealing products for themselves or 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 wider 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**

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	Technical Knowledge • Explore and use mechanisms (for example, levers, sliders, wheels and axles) in their products. • Build structures, exploring how they can be made stronger, stiffer and more stable.	**Technical Knowledge** • Explore and use mechanisms (for example, levers, sliders, wheels and axles) in their products. • Build structures, exploring how they can be made stronger, stiffer and more stable.	• Explore and evaluate a range of existing products.
Core Knowledge	1. Know about wheel mechanisms (Ref 1) Know the features of a Ferris Wheel. Know how to describe the features of a Ferris Wheel. 2. Know how to design a Ferris wheel (Ref 1) Know how to label their Ferris wheel using key vocabulary. Know how to explain each part of a Ferris wheel's function when creating their design. 3. Know how to select appropriate materials for my wheel (Ref 2). Know that different materials have different properties and are therefore suitable for different uses. Know how to select appropriate materials for each component in their wheel design while justifying their choices. 4. Know how to build a moving wheel (Ref 3). Know how to adapt and explain the adaptation of their design. 5. Know how to build the pod and add decoration (Ref 4).	1. Know the features of structures and the stability of different shapes (Ref 1). Know and identify when a structure is more or less stable than another. Know why different materials are good choices and explain how the stability could be improved. 2. Know that the shape of the structure affects its strength (Ref 2). Know how to make a structure stronger and more stable by considering the size, shape and materials used. 3. **(Lesson 3 and 4)** Know how to make baby bear's chair according to the design criteria (Ref 3). Know how to create joints and structures from paper, card and tape. Know how to create a stable structure with a variety of joining techniques and explain my choice of material. 4. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful (Ref 4). Know how to evaluate my chair. Know how to evaluate the product against a design criteria.	1. Know how to join fabrics together using different methods (Ref 1). Know how to join fabrics together and explain their choice of methods. 2. Know how to use a template to create my design (Ref 2). Know how to use complex shapes to create my design template. 3. Know how to join two fabrics together accurately (Ref 3). Know how to accurately and neatly join their two puppet faces together as one, with even spacing. 4. Know how to embellish my design using joining methods (Ref 4). Know and explain what effect they are trying to achieve with each embellishment. Embellish – Make something more attractive by the addition of decorative features. 5. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate my puppet. Know how to evaluate the product against a design criteria.

	Know and ensure that my pods stay upright when rotating around a fixed point. 6. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate using a word bank. Know how to evaluate the product against design criteria with a sentence finisher.		
Wider Knowledge	• To know that different materials have different properties and are therefore suitable for different uses. • To know the features of a Ferris wheel include the wheel, frame, pods, a base, an axle holder. • To know that it is important to test my design as I go along so that I can solve any problems that may occur.	• To know that shapes and structures with wide, flat bases or legs are the most stable. • To understand that the shape of a structure affects its strength. • To know that materials can be manipulated to improve strength and stiffness. • To know that a structure is something which has been formed or made from parts. • To know that a 'stable' structure is one which is firmly fixed and unlikely to change or move. • To know that a 'strong' structure is one which does not break easily. • To know that a 'stiff' structure or material is one which does not bend easily.	• To know that 'joining technique' means connecting two pieces of material together. • To know that there are various temporary methods of joining fabric by using stapes, glue or pins. • To understand that different techniques for joining materials can be used for different purposes. • To understand that a template (or fabric pattern) is used to cut out the same shape multiple times. • To know that drawing a design idea is useful to see how an idea will look.
Skills	• Design and label a wheel. • Consider the designs of others and make comments about their practicality or appeal.	• Generating and communicating ideas using sketching and modelling.	• Using a template to create a design for a puppet. • Cutting fabric neatly with scissors. • Using joining methods to decorate a puppet. • Sequencing steps for construction.

	• Consider the materials, shape, construction and mechanisms of their wheel. • Label their designs. • Build a stable structure with a rotating wheel. • Test and adapt their designs as necessary. • Follow a design plan to make a completed model of the wheel.	• Learning about different types of structures, found in the natural world and in everyday objects. • Making a structure according to design criteria. • Creating joints and structures from paper/card and tape. Building a strong and stiff structure by folding paper. • Exploring the features of structures. • Comparing the stability of different shapes. • Testing the strength of their own structures. • Identifying the weakest part of a structure. • Evaluating the strength, stiffness and stability of their own structure.	• Reflecting on a finished product, explaining likes and dislikes.
Diversity Links	• Gypsies and Travellers have been part of British society for over 500 years. There are between 250 000 and 300 000 Gypsies, Roma and Travellers in the UK. Not all people from the Gypsy and Traveller community live in caravans. Many live in permanent housing or on private campsites with long-stay permission. Traditional skills are passed down through generations. As in other communities, languages and beliefs are also handed down through families. Travelling communities have often been treated unfairly because some people do not understand Gypsy, Roma and		Designs in fabrics and clothing designs is influenced by the culture they are made in. Indian culture and clothing is different to African culture and clothing.

	Traveller traditional ways of life. People often do not like where sites are built, and can call nasty names at people from the Travelling communities. • The Appleby Horse Fair, also known as Appleby New Fair, is "an annual gathering of Gypsies and Travellers in the town of Appleby-in-Westmorland in Cumbria, England."[1] The horse fair is held each year in early June, attracting roughly 10,000 Gypsies and Travellers, about 1,000 caravans, several hundred horse-drawn vehicles, and about 30,000 visitors. The Gypsy and Traveller attendees include British Romanichal, Irish Travellers, Scottish Gypsy and Traveller groups, Kale (Welsh Romanies) and more.		
Vocabulary	design, wheel, pods, axle holder, design criteria, ferris wheel, axle, frame, mechanism	design criteria, man-made, natural, properties, structure, stable, shape, model, test.	decorate, design, fabric, glue, model, hand puppet, safety pin, staple, stencil, template, embellish.

Year 3/4 Cycle B	**Advent 1**	**Lent 1**	**Pentecost 1**
Topic	**Cooking and Nutrition** **Eating Seasonally**	**Electrical Systems** **Torches**	**Structures** **Constructing a castle**
National Curriculum	**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.	**Design** • Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose,	**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,

	• Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	aimed at particular individuals or groups. **Make** • 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** • 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. • Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors].	textiles and ingredients according to their characteristics. **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. **Evaluate** • Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
Core Knowledge	1. Know that climate affects food growth (Ref 1). Know that each country has its own climate. Know that not all fruits and vegetables can be grown in the UK. 2. Know and understand the advantages of eating seasonal foods grown in the UK (Ref 2).	1. Know how to analyse and evaluate different electrical products (Ref 2). Know how a circuit works within a torch. Know which features are good and bad about different torches and which features are appealing to the user. 2. Know how to design a torch to fit a set of specific user needs (Ref 3).	1. Know and identify different features of castles (Ref 1). Know and recognise how multiple shapes (2D and 3D) are combined to form a strong and stable structure. Know and explain which of the 3D shapes help to make the castle strong. 2. Know how to design a castle (Ref 2). Know how to design a castle with key features which appeal to a given person and purpose.

	Know that seasonal fruits and vegetables are those that grow in a given season and taste best then. Know that eating seasonal fruit and vegetables has a positive effect on the environment. 3. Know how to prepare and cook a fruit crumble using a range of cooking techniques (Ref 2). Know how to choose a fruit that is currently in season to make a simple fruit crumble. Know how to check quantities and work out if the ingredients used are in season. 4. Know how to create a recipe that is healthy and nutritious using seasonal vegetables and fruits (Ref 3). Know how to design their own tart recipe using seasonal ingredients. Know how to design their own tart recipe using seasonal ingredients considering the taste, texture, smell and appearance of the dish. 5. Know how to safely follow a recipe when making a tart (Ref 4). Know the basic rules of food contamination. Know how to store and clean a knife safely. Know how to work independently to follow the recipes, ensuring all ingredients, where applicable, are measured accurately.	Know how to design a torch which satisfies both the design and success criteria. 3. **(Lesson 3 and 4)** Know how to make a torch using the design criteria (Ref 4). Know how to make a torch using my design, with a working circuit and a switch. Know how to create a torch with special features to suit a specific user. 4. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate my torch. Know how to evaluate the product against a design criteria.	3. Know how to construct 3D nets (Ref 3). Know how to create more complex structural nets. 4. (Lesson 4 and 5) Know how to construct my final product (Ref 4). Know how to construct my final product to build a complex structure from simple geometric shapes. 5. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate my torch. Know how to evaluate the product against a design criteria.

	6. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate using a word bank. Know how to evaluate the product against design criteria with a sentence finisher.		
Wider Knowledge	• To know that not all fruits and vegetables can be grown in the UK. • To know that climate affects food growth. • To know that vegetables and fruit grow in certain seasons. • To know that cooking instructions are known as a 'recipe'. • To know that imported food is food that has been brought into the country.	• 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.	• To understand that wide and flat based objects are more stable. • To understand the importance of strength and stiffness in structures. • To know the following features of a castle: flags, towers, battlements, turrets, curtain walls, moat, drawbridge and gatehouse – and their purpose. • To know that a façade is the front of a structure. • To understand that a castle needed to be strong and stable to withstand enemy attack.
Skills	• Creating a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish. • Knowing how to prepare themselves and a workspace to cook safely in learning the basic rules to avoid contamination. • Following the instructions within a recipe.	• Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas. • Making a torch with a working electrical circuit and switch. • Using appropriate equipment to cut and attach materials. • Assembling a torch according to the design and success criteria. • Evaluating electrical products.	• Designing a castle with key features to appeal to a specific person/purpose. • Drawing and labelling a castle design using 2D shapes. • Designing and/or decorating a castle tower on CAD software. • Constructing a range of 3D geometric shapes using nets. • Creating special features for individual designs. • Making facades from a range of recycled materials.

	• Establish an design criteria to help test and review dishes. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Describing the benefits of seasonal fruits and vegetables and the impact on the environment. • Suggesting points for improvement when making a seasonal tart.	Testing and evaluating the success of a final product.	• Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison, to the original design. • Suggesting points for modification of the individual designs.
Diversity Links	Climate change affects us all. As the Earth warms, it's getting more unpredictable and extreme weather. Big storms and heavy rainfall cause flooding. Record high temperatures trigger droughts and wildfires. Melting ice caps make sea levels rise. Even the seasons are changing and wildlife is getting confused by warmer winters and earlier springs.	Lewis Latimer was a Black American inventor and designer who is most well known for his invention of the carbon filament, something which made lightbulbs more useful and meant that they were then used in public places and homes a lot more. He worked with Thomas Edison to improve his lightbulbs.	• Santiago Calatrava Valls is a Spanish Swiss architect, structural engineer, sculptor and painter, particularly known for his bridges supported by single leaning pylons and his railway stations, stadiums and museums.
Vocabulary	Climate, imported, natural, reared, seasonal, diet, ingredients, processed, recipe, seasons, sugar.	Battery, Bulb, Buzzer, Cell, Component, Conductor, Copper, Design criteria, Electrical item, Electricity, Electronic item, Function, Insulator, Series circuit, Switch, Test, Torch, Wire.	2D, 3D, castle, design, key features, net, scoring, shape, stable, stiff, strong, tab.

Year 5/6 Cycle B	**Advent 1**	**Lent 1**	**Pentecost 1**
Topic	Structures Bridges	Mechanical Systems Pop up book	**Cooking and Nutrition** **Come Dine with me**
National Curriculum	**Design** • Generate, develop, model and communicate their ideas through discussion and prototypes. **Make**	**Design** • Design appealing products that are fit for purpose, aimed at particular individuals or groups.	**Make** • Select from and use a wider range of materials and components, including

	• Select from and use a wider range of materials, components and construction materials according to their functional properties and aesthetics. **Evaluate** • Investigate and analyse a range of existing products. **Technical** • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures.	**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. **Technical knowledge** • Understand and use mechanical systems in their products [for example, pulleys, levers and linkages].	construction materials, textiles and ingredients, according to their qualities. **Cooking and nutrition** • Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.
Core Knowledge	1. Know how to reinforce a beam (structure) to improve its strength (Ref 1). Know the difference between a stronger and weaker structure. Know different ways to reinforce structures. 2. Know how to build a spaghetti truss bridge (Ref 2). Know how to build a sophisticated bridge from more accurate equilateral triangles which are securely constructed and assembled. 3. Know how to build a wooden truss bridge (Ref 3) (Lesson 3 and 4).	1. Know how to design a pop-up book (Ref 1). Know how to produce a suitable plan for each page and name each type of mechanism. Know how to design different mechanisms and structures on each page. 2. Know how to follow a design brief to make my pop-up book (Ref 2). Know how to make more complex mechanisms as detailed in my design. 3. Know how to use layers and spacers to cover the working of mechanisms (Ref 3).	1. Know and explain the use of complementary flavours. Know and suggest other foods that might enhance or balance one another. 2. Know how to research and design a three-course meal. Know to design a three – course meal and justify their choices. 3. (Lesson 3, 4 and 5: Starter, Main, Dessert) Know how to apply culinary skills and knowledge to create my meal. Know how to follow a recipe, using the correct quantities of each ingredient and adapting the recipe.

	Know how to cut the required beams to the correct size, using the *Truss bridge cutting mat* as a visual reference. Know how to plan and cut the required beams to the correct size, using a ruler and square to measure accurately. 5. Know how to complete and reinforce my truss bridge (Ref 4). Know how to identify points of weakness. Know how to reinforce weak areas following the testing. 6. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate my bridge. Know how to evaluate the product against a design criteria.	Know how to develop the quality of my book by using a range of mechanisms, layers and spacers. 4. Know how to complete the surface decoration of my pop-up book (Ref 4). Know how to complete the surface decoration of my pop-up book and create a back cover. 5. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate my pop up book. Know how to evaluate the product against a design criteria.	4. Know how to explore and evaluate my finished product. KSH – Kind, specific, helpful. Know how to evaluate my recipe. Know how to evaluate the product against a design criteria.
Wider Knowledge	• To understand some different ways to reinforce structures. • To understand how triangles can be used to reinforce bridges. • To know that properties are words that describe the form and function of materials. • To understand why material selection is important based on their properties. • To understand the material (functional and aesthetic) properties of wood.	• To know that mechanisms control movement. • To understand that mechanisms can be used to change one kind of motion into another. • To understand how to use sliders, pivots and folds to create paper-based mechanisms. • To know that a design brief is a description of what I am going to design and make. • To know that designers often want to hide mechanisms to make a product more aesthetically pleasing.	• That 'flavour' is how a food or drink tastes. • That many countries have 'national dishes' which are recipes associated with that country. • That 'processed food' means food that has been put through multiple changes in a factory. • That it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. • What happens to a certain food before it appears on the supermarket shelf (farm to fork).
Skills	• Designing a stable structure that is able to support weight.	• Designing a pop-up book which uses a mixture of structures and mechanisms.	• Writing a recipe, explaining the key steps, method and ingredients.

	• Creating a frame structure with focus on triangulation. • Making a range of different shaped beam bridges. • Using triangles to create truss bridges that span a given distance and support a load. • Building a wooden bridge structure. • Independently measuring and marking wood 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 appropriate materials is an important part of the design process. • Understanding basic wood functional properties. • 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.	• Naming each mechanism, input and output accurately. • Storyboarding ideas for a book. • Following a design brief to make a pop up book, neatly and with focus on accuracy. • Making mechanisms and/or structures using sliders, pivots and folds to produce movement. • Using layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result. • Evaluating the work of others and receiving feedback on own work. • Suggesting points for improvement.	• Including facts and drawings from research undertaken. • Following a recipe, including using the correct quantities of each ingredient. • Adapting a recipe based on research. • Working to a given timescale. • Working safely and hygienically with independence. • Evaluating a recipe, considering: taste, smell, texture and origin of the food group. • Taste testing and scoring final products. • Suggesting and writing up points of improvements in productions. • Evaluating health and safety in production to minimise cross contamination.
Diversity Links	What were bridges used for in ancient Greece? They are everyday ways of connecting places and people that have existed since humans have needed to cross a body of water, a ravine, or a valley. In Ancient Greece, it is thought that wooden bridges and constructions of overlapping stones through which water could flow, were commonplace.	Malorie Blackman is an English children's author. She writes young adult and children's novels, short stories, and picture books. She was named the United Kingdom's Children's Laureate in 2013.	Know that our foods come from different parts of world.

	https://kids.kiddle.co/Bridge		
Vocabulary	Beam bridge, arch bridge, truss bridge, strength, techniques, corrugation, lamination, stiffness, technique, corrugation, lamination, stiffness, rigid, factors, stability, visual appeal, aesthetics, joints, mark out, hardwood, softwood, wood file/rasp, sandpaper/glasspaper, bench hook/vice, tenon saw/coping saw, assemble, material properties, reinforce, wood sourcing, evaluate, quality of finish, accuracy.	Aesthetic, Computer-aided design (CAD), Caption, Design, Design brief, Design criteria, Exploded-diagram, Function, Input, Linkage, Mechanism, Motion, Output, Pivot, Prototype, Slider, Structure, Template	balance, bitter, bridge method, complement, cross-contamination, enhance, equipment, farm to fork, flavours, ingredients, method, research, pairing, recipe, preparation, salty, sour, storyboard, sweet, cookbook.