





Cowling Community Primary School

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Design Technology Long Term Plan

Curricular Goal			
Provide opportunities to design, make, evaluate, use technical knowledge and learn about cooking and nutrition, sewing and textiles, and mechanisms and structures. Ensure and develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.			
Components: Sewing and Textiles Year B			
EYFS	KS1	LKS2	UKS2
<p>Children will design an item of clothing to keep teddy warm, cut fabric, join fabric together and decorate.</p> <ol style="list-style-type: none"> 1. Explore different materials freely, to develop their ideas about how to use them and what to make. 2. Develop their own ideas and then decide which materials to use to express them. 3. Join different materials and explore different textures. 4. Return to and build on their previous learning, refining ideas and developing their ability to represent them 5. Create collaboratively sharing ideas, resources and skills. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> ● To investigate a range of puppets and their features. ● To be able to work with fabric to create a hand puppet. ● To develop and practise sewing skills. ● To be able to design a hand puppet. ● To be able to follow a design to make a puppet. ● To be able to evaluate a finished product. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> ● To investigate and analyse different types of cushions. ● To explore different ways to join fabric using sewing skills. ● To explore different ways to decorate fabric using sewing skills. ● To explore different ways to create fastenings. ● To design a cushion cover. ● To make and evaluate a cushion cover. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> ● To investigate a range of pencil cases. ● To practise and compare sewing stitches.(tacking). ● To investigate ways of opening and closing pencil cases. ● To be able to sew embellishments to a piece of fabric. ● To be able to design a pencil case. ● To be able to make and evaluate a pencil case based on a design.
	<p>Puppets</p> <ol style="list-style-type: none"> 1. Children to discuss and explore a range of puppets, their features, what materials are used and what they are used for. They will have the opportunity to choose their favourite puppet, draw and label it. 2. Children will explore different ways of joining fabrics together, including glueing, pinning and stapling and then evaluate the different methods. 3. Children will learn running stitch to use when creating a puppet. They will practise these skills before making their actual puppet. 4. Children use the skills they have acquired to design their own hand puppet. They will recap the possible techniques to use and share their ideas to help create their designs. 5. Using the technical skills they have 	<p>Cushions (PlanBee)</p> <ol style="list-style-type: none"> 1. Children will learn about the history of the product that they will be making in this unit. As a class they will begin to analyse a range of cushions based on their functional and aesthetic features. In their independent activities, children will either further analyse a cushion, or match up different products to people, depending on the user's needs. 2. Children will investigate how to join two pieces of fabric together. They will learn about the right and wrong sides of fabric, and how to secure their first and last stitches with a knot. In their independent activities, children will explore a range of either hidden or visible stitches, and discuss which would be the most suitable when making their cushion cover. 	<p>Pencil cases</p> <ol style="list-style-type: none"> 1. Children will study and describe a variety of pencil cases, identifying their fastenings and how materials have been joined. 2. Children will recap about a variety of hand-sewing stitches, then either practise joining pieces of scrap material using different hand-sewing stitches, or practise stitches using a template. (Sewing machine). 3. Children will learn how zips, buttons, poppers and toggles may be used to fasten pencil cases. They may then either practise sewing buttons and buttonholes, or sewing and attaching toggles and loops. 4. Children will consider ways in which sewing patterns, and fastening of other materials and embellishments by sewing may make a product design more attractive. They will then practise



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developed, Sew their fabric together using a simple running stitch. Children follow their designs to create their hand puppet. They should think about the appropriate materials to use and to work safely and carefully

6. Decorating the puppet. Carefully selecting a variety of materials, children decorate their puppets in keeping with their chosen design.
7. Children to share and demonstrate their puppets. They will then evaluate their own puppets.

Skills:

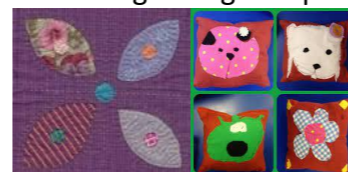
- Glueing, pinning and stapling
- Running stitch
- Using scissors to cut around a template
- Decorating their puppet using glue with beads, buttons etc.

Knowledge:

- 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 staples, glue or pins.
- To understand that different techniques for joining materials can be used for different purposes.
- To know that sewing is a method of joining fabric
- To know that different stitches can be used when sewing.
- To understand the importance of tying a knot after sewing the final stitch.
- 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.

Children will review their sewing skills and learn two new techniques: cross stitch and applique.

3. Children will recap on the meaning of 'aesthetic features', and then discuss the different ways in which cushions can be made visually appealing. They will explore how the use of adornments and the skills of embroidery and appliqué can be used to decorate a cushion cover in the independent activity.
4. Children will explore the different fastenings that could be used for cushion covers, and discuss them in terms of secureness, durability and aesthetics. They will explore how to create some of these fastenings in their independent activities.
5. Children will use their knowledge of joining techniques, decorative sewing skills and fastenings to design their own cushion cover. They will be encouraged to think through the different steps of the making process, and plan ahead for any of the aspects that they might find challenging. They will need to ensure that it satisfies the design criteria.
6. Children will make their cushion cover. Assembling the cushion; children complete their cushions, sewing the edges, stuffing them and using decorative pieces of material (applique). They will be encouraged to regularly check their design, and make changes to it if necessary. Once completed, children will evaluate their finished product by answering a range of questions.



Skills:

- Cross stitch and Applique
- Cutting accurately with textile scissors
- Attaching decorative pieces in different ways.
- Making their own template.

decorative sewing methods.

5. Children will draw and annotate a design for a pencil case, taking into consideration some given limitations, and thinking about how it may be decorated.
6. Children create a template to cut their material.
7. Children assemble their product using their existing knowledge, skills and understanding, thinking about the aesthetics and quality finish of their product.
8. Children will evaluate their product against the original design criteria and assess how they feel that they did with their final outcome.



Skills:

- Cross stitch
- Using a sewing machine
- Making their own templates
- Attaching fastenings such as a zip, velcro, toggle or button.
- Sewing on embellishments using a learnt stitch.

Knowledge:

- To understand that it is important to design a pencil case with the client/ target customer in mind.
- To know that using a template helps to accurately mark out a design on fabric.
- To understand the importance of consistently sized stitches.
- To know how to use a sewing machine.



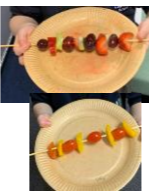
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		<p>Knowledge:</p> <ul style="list-style-type: none"> ● To know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric to larger pieces. ● To know that when two edges of fabric have been joined together it is 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. ● To know that creating a mock up (prototype) of their design is useful for checking ideas and proportions. 	
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Provide opportunities to design, make, evaluate, use technical knowledge and learn about cooking and nutrition, sewing and textiles, and mechanisms and structures. Ensure and develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.			
Component: Food and Nutrition Year A			
EYFS	KS1	LKS2	UKS2
<p>Snack</p> <ol style="list-style-type: none"> 1. Children understand the importance of hand washing before eating. 2. Adults to model, leading to independence, preparation of food by peeling oranges, bananas etc, pulling apart orange segments, opening milk cartons. 3. Adults discuss with children where fruit and vegetables come from, how it grows and why it is important. 4. Children are encouraged to 	<p>Learning objectives:</p> <ul style="list-style-type: none"> ● To make a healthy picnic product - that is colourful and appealing to eat. ● Taste and evaluate a variety of fruits and vegetables. ● To explore what makes a balanced diet and taste test combinations of different food groups. ● Be able to name and sort foods into the five groups from the Eatwell Guide. They should know that a healthy diet comprises food and drinks from each of the food groups. ● Know that food ingredients can be combined according to their sensory characteristics - appearance, taste (flavour), texture (mouth feel) and smell (aroma). <div style="text-align: right;">  </div>	<p>Learning objectives:</p> <ul style="list-style-type: none"> ● To read packaging to find out the main ingredients used and discuss with the children their possible function. ● That biscuits/cookies come in many forms <i>eg sweet and savoury</i>, with a variety of shapes, textures and finishes. ● Select food ingredients with appropriate qualities to achieve the desired outcome, fair trade where possible. ● To read scales accurately - using grams. ● Make accurately and safely with regard to the quality of the end product. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> ● To research soups from other countries and cultures. ● To carry out sensory evaluations of a range of soups and to record their evaluations using a table or chart. ● To know that climate and conditions affect when and where food is produced. ● To be able to use a range of cooking techniques such as peeling, grating, chopping and slicing vegetables safely and hygienically. ● To be able to follow a recipe for making soup. ● To create design criteria for their own soup. ● To use results of their research when developing design ideas. ● To prepare and cook their own soup.



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<p>pour their own drinks.</p> <p>5. Develop an understanding of food hygiene by cleaning their cups and eating space</p> <p>Baking</p>	<ul style="list-style-type: none"> Know that everyone should eat at least five portions of fruit and vegetables every day. A portion is what fits into the palm of a hand. Variety is important and different types of fruit and vegetables count. 	<ul style="list-style-type: none"> Revisiting learning from KS1 that there are five main food groups in the Eatwell Guide. 	<ul style="list-style-type: none"> To evaluate their soup against the design criteria.
<p>Children learn to follow a recipe book including collecting the equipment and ingredients they will need, (throughout the year adults to model then allow full independence), skills::</p> <ol style="list-style-type: none"> Scooping Weighing Cracking Beating / Whisking Pouring Dividing 	<p>Teddy Bears Picnic – Fruit/Veg skewers</p> <p>Children learn how to identify fruits and vegetables and then design and make a fruit or vegetable kebab.</p> <ol style="list-style-type: none"> This unit begins with a letter from Paddington Bear inviting the children to prepare some food for a picnic. The children learn about where food comes from; farmed, grown or caught. Children explore the Eatwell plate and place ingredients in the correct categories. They make Frittata or Rainbow cakes with the ingredients to learn about different ways of preparing food. The children discuss what it means to eat healthy food and choose 5 fruits and vegetables they would take on a picnic. Children make a shopping list of their ingredients and then assemble their skewers in an attractive way. Children learn how to assemble ingredients to prepare food, using simple tools to cut, peel or grate safely and hygienically. Follow health and safety rules. Children evaluate ideas and finished products against design criteria, including intended user and purpose. <p>SKILLS:</p> <ul style="list-style-type: none"> Measure and weigh food items – non statutory measures e.g. spoons, cups Develop a food vocabulary using taste, smell, texture and touch, describe the ingredients used. Include washing, peeling, juicing, grating and cutting (Cutting with scissors – snip herbs). (adult supervision). 	<p>Willy Wonka’s Fair Trade cookies.</p> <p>Research fair trade products and design and make creative cookies. Children adapt a recipe by adding or altering the ingredients and then work in groups to create a final design that falls within a design brief.</p> <ol style="list-style-type: none"> Make a list of different types of biscuits/cookies and discuss their similarities and differences. Provide a variety of biscuits/cookies, some fair trade products where appropriate e.g. <i>sweet, savoury, plain, flavoured, sandwiched, enrobed</i> and discuss with the children <i>appearance, shape, cost, flavour, texture</i>. Record as a profile for each biscuit/cookie. Read packaging to find out the main ingredients used and discuss with the children their possible function. Discuss the importance of FairTrade and how it improves the lives of farmers and workers. Children watch a modelled recipe and discuss how the recipe can be adapted. Children work in groups to draw up a simple design specification. They select a final idea and to plan out the main stages of making and to list the ingredients and equipment. Children evaluate their products against the design specification and record improvements they might make. <p>SKILLS:</p> <ul style="list-style-type: none"> Using a peeler Follow a simple recipe Rubbing together butter and flour Slice, grate, mix and bake Weigh out ingredients using scales Make healthy eating choices from an understanding of a balanced diet. 	<p>Making soup.</p> <p>Read the letter from the school cook asking for their help to design a range of healthy soups for lunchtimes.</p> <ul style="list-style-type: none"> Working in groups to establish favourite soups, ingredients, where the ingredients are from and where in the world the recipe was designed. Research soups from around the world. Teacher to model for the children how to evaluate a soup using sensory descriptors for appearance, aroma (smell), taste, texture (mouth feel). Children to evaluate a variety of soups and grade. Research seasonal food and the benefits of consuming seasonal food. Use Eat the seasons and Eatwell plate to focus on seasonal food. Use the Food fact of life website. Look at different techniques for preparing vegetables to make a chunky vegetable soup. Peel Chop Slice Grate Dice Cube Bridge hold Fry Simmer. Design the soup using information they have gathered, using a set design criteria. In their group, make the soup working collaboratively to prepare the ingredients. Use an evaluation sheet to evaluate all soups and feed back to the class. <p>Skills:</p> <ul style="list-style-type: none"> Using a sharp kitchen knife. Peel, chop slice, grate, dice, cube, bridge hold, fry and Simmer. <p>Knowledge:</p> <ul style="list-style-type: none"> To know what seasonal food is. To Know how to prepare food. 



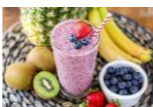
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	<p>Knowledge:</p> <ul style="list-style-type: none"> To know that 'diet' means the food and drink that a person or animal usually eats. To understand what makes a balanced diet. To know where to find the nutritional information on packaging. To know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar. To understand that I should eat a range of different foods from each food group, and roughly how much of each food group. 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 I should only have a maximum of five teaspoons of sugar a day to stay healthy. To know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'. 	<ul style="list-style-type: none"> Know which food is healthy and which is not. <p>Knowledge:</p> <ul style="list-style-type: none"> To know what a fair Trade product is and who it benefits. To know how to adapt a recipe using their choice of ingredients. To know how to prepare certain foods. To know how to explain what they like and dislike about their finished product To know that the amount of an ingredient in a recipe is known as the 'quantity.' To know that it is important to use oven gloves when removing hot food from an oven. To know the following cooking techniques: sieving, creaming, rubbing method, cooling. To understand the importance of budgeting while planning ingredients for biscuits. 	<ul style="list-style-type: none"> To Know where in the world certain foods originate. To know that 'flavour' is how a food or drink tastes. To know that many countries have 'national dishes' which are recipes associated with that country. To know that 'processed food' means food that has been put through multiple changes in a factory. To understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides. To understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).
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Component: Food and Nutrition Year B

<p>Snack</p> <ol style="list-style-type: none"> Children understand the importance of hand washing before eating. Adults to model, leading to independence, preparation of food by peeling oranges, bananas etc, pulling apart orange segments, opening milk cartons. Adults discuss with children where fruit and vegetables come from, how it grows and why it is important. Children are encouraged to pour their own drinks. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> To make a healthy drinks product - that is appealing to drink. Taste and evaluate a variety of fruits. To explore what makes a balanced diet and taste test combinations of different food groups. Be able to name and sort foods into the five groups from the Eatwell Guide. They should know that a healthy diet comprises food and drinks from each of the food groups. Know that food ingredients can be combined according to their sensory characteristics - appearance, taste (flavour), texture (mouth feel) and smell (aroma). Know that everyone should eat at least five portions of fruit and vegetables every day. A 	<p>Learning objectives:</p> <ul style="list-style-type: none"> Learn that there is a wide variety of different salads which can be assembled from many different ingredients and that many salads originate from different countries. That foods can be sorted into 5 groups and that a healthy diet is based on a balance and variety of these foods in the proportions shown on the Eatwell Guide. How to investigate and evaluate food products using sensory vocabulary. How to investigate and research work to develop criteria for their salad. How to use their knowledge of the Eatwell Guide when planning which ingredients to select giving consideration to how combinations will taste. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> To investigate and evaluate bolognese sauce products according to their characteristics. Explore where each ingredient for a traditional spaghetti Bolognese comes from and the origins of the dish. Know that the Eatwell Guide shows us the proportions of different food groups we should eat. To consider taste, texture, appearance and aroma, and think about how the ingredients would contribute to a healthy and varied diet by making selections from the food groups illustrated in the Eatwell Guide. How to find out which different ingredients are needed to make bolognese sauce and how ingredients can be altered and mixed to create
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<p>10. Develop an understanding of food hygiene by cleaning their cups and eating space</p> <p>Baking</p> <p>Children learn to follow a recipe book including collecting the equipment and ingredients they will need, (throughout the year adults to model then allow full independence), skills::</p> <ol style="list-style-type: none"> 7. Scooping 8. Weighing 9. Cracking 10. Beating / Whisking 11. Pouring 12. Dividing 	<p>portion is what fits into the palm of a hand. Variety is important and different types of fruit and vegetables count.</p>	<ul style="list-style-type: none"> ● That it is important to present food in an appetising way and apply this to their work. ● How to plan the steps needed to prepare their salads ● How to use equipment safely and accurately. ● How to talk about what they have done, explaining their decisions. ● How to evaluate their work against the criteria they set. ● How to evaluate the work of others in a positive and fair way. 	<p>different effects.</p> <ul style="list-style-type: none"> ● How to make a sauce from a plan we have designed. ● How to work safely and hygienically. ● How to evaluate a finished product. ● Learn about a famous Italian chef.
	<p>Fruit Smoothies</p> <ol style="list-style-type: none"> 1. Children talk about how fruit comes from different places around the world. 2. Children record information in a sensory chart. 3. Evaluate existing fruit drinks and discuss preferences. 4. Children talk about the need for a healthy diet and the important contribution of fruit.(The Eatwell Plate). 5. Children learn how to assemble ingredients to prepare food, using simple tools to cut, peel or grate safely and hygienically. 6. Follow health and safety rules. 7. Children evaluate ideas and finished products against design criteria, including intended user and purpose. <p>SKILLS:</p> <ul style="list-style-type: none"> ● Cutting with scissors – snip herbs ● Measure and weigh food items – non statutory measures e.g. spoons, cups ● Develop a food vocabulary using taste, smell, texture and touch, describe the ingredients used. 	<p>Making a Salad</p> <ul style="list-style-type: none"> ● Children will say what they think of when you say ‘salad’. They will talk about what ingredients they have seen in salads, what sorts of salads they have eaten and what they like or dislike about salads. ● Children will look at a selection of bought salads and talk about the countries from which these salads originate. ● Children will look at the size of the sections and what this means; taking one salad and sorting its components into the Eatwell Guide.groups. They will discuss which food groups are included in this salad and what could be added so it covers more of the food groups. ● The children will try an ingredients tasting session and evaluate. ● Children will use the internet to find recipes for salads, local restaurant menus that contain salads or salads traditionally associated with specific countries, e.g. Italy, Greece. ● Children will think about the considerations that need to be made, e.g. attractive presentation (colourful ingredients), if the salad is for a 	<p>Make spaghetti bolognese</p> <p>From farm to fork - What could be healthier?</p> <ol style="list-style-type: none"> 1. Children learn how beef, the main ingredient of a bolognese sauce, is farmed and are made aware of key welfare issues surrounding the rearing of cattle. (Discuss a vegetarian option). 2. Children taste test bolognese sauces to compare their nutritional values. 3. They research variants of the recipes and work in small groups to decide on ingredients to make their own healthy sauce. 4. Children work in their groups to make their own sauce using the ingredients and methods that they have decided on. 5. They design packaging that promotes it as a healthy and ethical choice. 6. Children evaluate their products against the design specification and record improvements they might make. <p>SKILLS:</p> <ul style="list-style-type: none"> ● Planning and preparing a meal. ● Understand the difference between a sweet and savoury dish



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	<p>Knowledge:</p> <ul style="list-style-type: none"> • Understanding the difference between fruits and vegetables. • To understand that some foods typically known as vegetables are actually fruits (e.g. cucumber). • To know that a blender is a machine which mixes ingredients together into a smooth liquid. • To know that a fruit has seeds and a vegetable does not. • To know that fruits grow on trees or vines. • To know that vegetables can grow either above or below ground. • To know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber). 	<p>vegetarian, a person with a food intolerance, to be eaten as a side dish or as a main meal.</p> <ul style="list-style-type: none"> • Children will need to think about the purpose of their salad and develop a criteria for their designs, e.g. an Italian salad, a vegetarian salad or salad for a lunchbox. • Children will write, type or draw a recipe for their salad, including an ingredient list (including quantities), an equipment list, and a sequenced method. • Children will evaluate their work against the original criteria also considering the presentation and taste. <p>SKILLS:</p> <ul style="list-style-type: none"> • Planning and preparing a salad.. • Demonstrate how to peel, grate and cut ingredients safely with the equipment, e.g. using a fork to secure items before they are cut, ensuring fingers are out of the way as food is being sliced. <p>Knowledge:</p> <ul style="list-style-type: none"> • 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 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. • 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 safety rules for using, storing and cleaning a knife safely. 	<ul style="list-style-type: none"> • Explain how food ingredients should be stored and give reasons. • Whisking, using a balloon whisk or handheld mixer (if relevant) • Using heat on the hob and oven. • Budgeting and food waste. <p>Knowledge:</p> <ul style="list-style-type: none"> • To understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key welfare issues. • To know that I can adapt a recipe to make it healthier by substituting ingredients. • To know that I can use a nutritional calculator to see how healthy a food option is. • To understand that 'cross-contamination' means bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.
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		<ul style="list-style-type: none"> To know that similar coloured fruits and vegetables often have similar nutritional benefits. 	
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Provide opportunities to design, make, evaluate, use technical knowledge and learn about cooking and nutrition, sewing and textiles, and mechanisms and structures. Ensure and develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.			
Component: Mechanisms Year A			
EYFS	KS1	LKS2	UKS2
<p>Through continuous provision children have the opportunity to build upon knowledge and skills involving mechanical processes.</p> <ol style="list-style-type: none"> 1. Offer opportunities to encounter and revisit key materials, e.g. drawing media, paper, paint, cardboard and clay in order to continue to develop expertise as tools for expression and communication. 2. Provide a range of joining materials (e.g. stapler, masking tape, glue, string, thread, split pins, treasury tags, card strips) to support children working in both 2D 	<p>Learning objectives:</p> <ul style="list-style-type: none"> Examine a range of moving vehicles and identify the purpose, suitability, appearance and function and how they work. To investigate and understand how wheels and axles are assembled and how they work. To create a moving vehicle. Identify the suitability of materials ensuring they are fit for purpose. Create a design specification for their own vehicle - use annotated drawings and communicate ideas. Verbally plan a sequence of actions. How to select from and use appropriate tools with help. To test and evaluate the vehicle thinking about purpose and suitability. Suggest improvements during and after the design and making process. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> Learn about Leonardo Da Vinci. Understand the term levers and linkages . How to Investigate and analyse books and, where available, other products with lever and linkage mechanisms. How to use prototypes to develop and share ideas. Understand and use lever and linkage mechanisms. Distinguish between fixed and loose pivots. How to generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user. How to use annotated sketches and prototypes to develop, model and communicate ideas. How to plan a sequence of actions to make a product. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> Learn how STEM can help solve global issues and achieve the UN Global Goals. Learn how to generate ideas through research and develop and communicate a simple design specification. How to generate innovative ideas by carrying out research using web -based resources. Understand how key individuals in design and technology have helped shape the world - Archimedes and Isambard Kingdom Brunel. Research and develop design criteria to inform the design of innovative and functional products that are fit for purpose, aimed at a particular group. Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams and prototypes. Evaluate their ideas and products against their own



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<p>and 3D.</p> <ol style="list-style-type: none"> 3. Supply open-ended props and materials that can easily be transformed in play 4. Introduce the design sheets to help children think about their design process including the elements of design, make and evaluate. 		<ul style="list-style-type: none"> ● How to order the main stages of making. ● How to select from and use appropriate tools with some accuracy to cut, shape and join paper and card. ● How to select from and use finishing techniques suitable for the product they are creating. ● How to evaluate their own products and ideas against criteria and user needs, as they design and make. 	<p>design criteria and consider the views of others to improve their work.</p> <ul style="list-style-type: none"> ● Test products and critically evaluate the quality of their design, manufacture, functionality and fitness for purpose. ● Understand that mechanical systems have an input, process and an output. ● Understand how pulleys can be used to speed up, slow down or change the direction of movement. ● Know and use technical vocabulary relevant to the project.
<p>Design and make a moon buggy using a variety of materials.</p> <p>Build rockets/boats using construction materials.</p>	<p>Mechanisms – wheels and axles A small scale wheeled vehicle that will help the duck around the farm - Farmer Duck Martin Waddell</p> <ul style="list-style-type: none"> ● Children discuss the different features of the vehicles ● Children identify the different parts of vehicles – wheel, axle, chassis, body, cab. ● Children make simple freehand drawings of vehicles and label parts appropriately. ● Children investigate toy vehicles, using ramps to investigate how they move down a slope and to explore the function of the wheels and axles. ● Children to practise joining wheels and axles to allow movement. ● Children could try out different ways of making axle holders e.g., punching holes in cards or boxes, using large drinking straws. ● Children design a vehicle for a person they know. What features would they incorporate into their design? Draw and label a picture of the design. ● Children will think about the order they will do things. ● Children evaluate their design criteria. 	<p>Mechanisms - Pop up books Design a book about robots to inform older ks2 children about the invention of robots - working in groups.</p> <ul style="list-style-type: none"> ● Children will learn what is meant by the term levers and linkages. ● They will look at the historical context of the use of levers and linkages. ● Children will make a fact file based on the inventor Leonardo da Vinci. ● Children will look at a variety of books with moving parts and questions will develop children’s understanding. ● Children will look at a range of lever and linkage mechanisms. ● Children will be shown the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques. ● Children will produce a range of different lever and linkage mechanisms using existing templates. ● Children will the purpose of their book in a design brief. ● Children will develop their knowledge and skills by undertaking a mini design and make 	<p>Mechanisms - Can you design and make a model to transport tomatoes down the mountainside in Nepal?</p> <ul style="list-style-type: none"> ● Children will be Introduced to the challenge explaining that they will be using their STEM skills to try and solve a problem faced by communities in a country in a different part of the world. ● They will learn about Nepal and Identify challenges in Nepal. ● Children will look at Archimedes, and the early users of the pulley system. How did the early systems influence the lives of people living then? ● Children will draw diagrams to show the different types of pulley systems and understand how they work. ● Children will develop, model and communicate their ideas in small groups and design a pulley system. ● Children will plan the steps needed to fulfil their design brief and will make their pulley system and test it. ● Children will present their model to the rest of the class reflecting on how well they worked together and problems they solved. ● They will evaluate their product under the key Headings: user, purpose, innovation, authenticity, functionality and



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	<ul style="list-style-type: none"> Children reflect on their design and test it. Children evaluate their work against a criteria. Children consider the needs of the end user in mind.  <p>Skills:</p> <ul style="list-style-type: none"> measuring and cutting accurately Communicating ideas Selecting suitable tools and materials Demonstrate and range of joining techniques Improving and evaluating designs <p>Sticky knowledge:</p> <ul style="list-style-type: none"> Know different parts of a vehicle and label. Know what a wheel and axle does and how to make one. Know how to draw, label and order their own design, Know how they could test their product in order to evaluate if they have been successful. 	<p>activity using one of their lever/linkage templates to create a prototype.</p> <ul style="list-style-type: none"> Children will evaluate their prototypes and using annotated sketches continue to develop, model and communicate their ideas. The children will consider the main stages in making before assembling high quality products, drawing on the knowledge, understanding and skills learnt. Children demonstrate their models– a short video could be made to illustrate the movement. Children will evaluate the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.  <p>Skills:</p> <ul style="list-style-type: none"> Cutting and assembling accurately. Creating different movements (up, down, along and around) Making functional components using layers and spacers to construct pages Selecting appropriate equipment and materials. <p>Sticky knowledge:</p> <ul style="list-style-type: none"> Know what a lever and linkage is and give examples. Know why Leonardo De Vinci is historically important. Know how to make moving parts in a book and what they could use to make them move. Know how to annotate sketches and the importance of working in ordered stages. 	<p>design decisions</p>  <p>Skills:</p> <ul style="list-style-type: none"> Select and use a wide range of tools and equipment to perform practical tasks accurately. Select from and use a wide range of materials and components according to their functional properties. <p>Sticky knowledge:</p> <ul style="list-style-type: none"> Know where in the world Nepal is and the challenges facing members of their community. Know who Archimedes is and why he is important. Know what a pulley system is. Know how to draw labelled diagrams to develop their ideas. Know the importance of planning the steps needed and adapting it. Know how to carry out a test.
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Curricular Goal
 Provide opportunities to design, make, evaluate, use technical knowledge and learn about cooking and nutrition, sewing and textiles, and mechanisms and structures. Ensure and develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.

Components: Structures **Year A**

EYFS	KS1	LKS2	UKS2
<p>Through continuous provision children have the opportunity to build upon knowledge and skills involving structures.</p> <p>3D structures from around the world in hot countries</p> <ul style="list-style-type: none"> Experiment with different ways of joining. <p>Build and construct with a wide range of objects, selecting appropriate resources. Handle equipment and tools effectively. Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p>		<p>Learning objectives:</p> <ul style="list-style-type: none"> About key structures in design and technology. Understand the term shell structure and use shell structures. How to use models, kits and drawings to formulate design ideas. How to investigate and analyse books, videos and products with shell structures. Know what a net of a shape is and know the skills and techniques needed to score, cut out and assemble using pre-drawn nets. Use different ways of stiffening and strengthening their shell structures. Use computer-aided design (CAD) software to design the net, text and graphics for their products according to purposes. How to use research information to inform decisions. Use annotated sketches and prototypes to develop, model and communicate ideas. How to select from and use appropriate tools with some accuracy to cut and join materials and components. How to evaluate their own products and ideas against criteria and user needs, as they design and make. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> To understand the term frame structure. To investigate the purpose and appearance of bird houses. To investigate the materials and features of bird houses and how to draw diagrams. To investigate and practise woodwork skills. To be able to design a birdhouse for a specific bird. To be able to make a bird house by following a plan. To evaluate, make predictions and promote a completed bird house.
		<p>A biscuit holder Shell Structures</p> <ul style="list-style-type: none"> Children will look at St Peter's Basilica in Vatican City, Italy and Michelangelo– Write a fact file including relevant facts about the 	<p>Building a birdhouse.. Frame Structures</p> <ol style="list-style-type: none"> 1. Children will look at the Eiffel Tower in Paris, France and learn about Gustave Eiffel - frame structures.







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		<p>architecture of the Dome.</p> <ul style="list-style-type: none">• Children will investigate a collection of different shell structures including packaging.• Children will take a small package apart identifying and discussing parts of a net including the tabs.• Children will evaluate existing products to determine which designs children think are the most effective.• Children will discuss graphics including colours/ impact of style/logo/size of font.• Children will practise making nets out of card, joining flat faces with masking tape to create 3-D shapes and experiment with assembling in nets in numerous ways.• Children will practise constructing a simple box and will be shown how a window could be cut out and acetate sheet added.• Children will practise stiffening and strengthening their shell structures and to carry out tests to find out where their structures might need to be strengthened or stiffened.• Children will discuss and explore the graphics techniques and media that could be used to achieve the desired appearance of their products.• Children will develop a design brief within a context which is authentic and meaningful and to use annotated sketches and prototypes to develop, model and communicate their ideas for the product• Children will identify the main stages of making and the appropriate tools and skills they will need. They will work with accuracy, using computer-aided design (CAD) where appropriate.• Children will evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the	<ol style="list-style-type: none">2. Children will look at a variety of different bird houses and discuss the differences in appearance, their functions and what types of birds they attract.3. Children will discuss and explore different materials used to build bird houses and any additional features that have been added to them. They will be challenged to draw 3-D diagrams or exploded diagrams of different bird houses and discuss why creating a plan beforehand is important.4. Children will explore and explain the various different woodwork equipment needed to build their bird houses. They will then practise these skills to help learn techniques before building their actual bird house.5. Children write a detailed plan and design a birdhouse with a specific bird in mind. They will need to find information for the bird's requirements, decide on materials to use and equipment, think how to decorate it and any additional features as well as consider safety precautions.6. Children will learn to reinforce square frameworks using diagonals to help develop an understanding of using triangulation to add strength to a structure.7. Children will discuss a design brief and produce a detailed, step-by-step plan, listing tools and materials.8. Referring to previously created designs, children will make their bird houses. They will need to collect the materials and tools they will need and work safely and carefully when constructing their bird house.9. Children will evaluate their own design process and finished product, drawing on their design specification, and thinking about the intended purpose and user.
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		<p>design criteria previously agreed.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Skills:</p> <ul style="list-style-type: none"> ● Making nets out of cards, joining flat faces with masking tape to create 3-D shapes. ● Stiffening and strengthening shell structures. ● Score, cut out and assemble using pre-drawn nets. ● Use annotated sketches and prototypes to develop, model and communicate ideas. ● Using computer-aided design (CAD). <p>Knowledge:</p> <ul style="list-style-type: none"> ● Know about St Peter's Basilica in Vatican City, Italy and Michelangelo. ● Know what a shell structure is. ● Know what a net is. ● Know how graphics are used to enhance a product. ● To understand the importance of strength and stiffness in structures. ● To know that a 'free-standing' structure is one which can stand on its own. <p>Additional:</p> <ul style="list-style-type: none"> ● 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 	<div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>Skills:</p> <ul style="list-style-type: none"> ● Make annotated drawings of a range of portable and permanent frame structures. ● Use plastic strips and paper fasteners to build 2-D frameworks. ● Reinforcing square frameworks using diagonals. ● Joining framework materials together accurately. ● Using newspaper rolls, masking tape or paper straws with pipe cleaners to build 3-D frameworks such as cubes, cuboids and pyramids. <p>Knowledge:</p> <ul style="list-style-type: none"> ● To learn about the Eiffel Tower in Paris, France and Gustave Eiffel. ● To know what a frame structure is. ● To understand some different ways to reinforce structures. ● To understand how triangles can be used to reinforce structures.. ● To know that properties are words that describe the form and function of materials. ● To understand why material selection is important based on properties. ● To understand the material (functional and aesthetic) properties of wood. <p>Additional:</p> <ul style="list-style-type: none"> ● To understand what a 'footprint plan' is. ● To understand that in the real world, design can impact users in positive and negative ways. ● To know that a prototype is a cheap model to test a design idea.
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		<p>purpose.</p> <ul style="list-style-type: none"> To understand that the target audience means the person or group of people a product is designed for. 	
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Design Technology Long Term Plan

Curricular Goal Provide opportunities to design, make, evaluate, use technical knowledge and learn about cooking and nutrition, sewing and textiles, and mechanisms and structures. Ensure and develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.			
Components: Structures Year B			
EYFS	KS1	LKS2	UKS2
	Learning objectives:	:	



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	<ul style="list-style-type: none">• Understand what a freestanding structure is.• Look at and explore free standing structures.• investigate and analyse books, videos and products with free standing structures and those in their own environment.• How to make structures stronger.• How to test different methods of enabling structures to remain stable.• How to use pictures and words to convey what they want to design/make.• How to explore ideas by rearranging materials.• How to select appropriate techniques explaining First...Next....Last.• How to select materials from a limited range that will meet the design criteria.• How to select and name the tools needed to work the materials.• How to say what they like and do not like about items they have made and attempt to say why.• How to discuss how closely their finished product meets their design criteria and how well it meets the needs of the user.		
	<p>Building a playground Freestanding Structures</p> <ul style="list-style-type: none">• Children will look at the Clifton suspension bridge in Bristol and draw a picture of the bridge and write a short fact file about Isambard Kingdom Brunel.• Children will go on a walk and look at photographs of the local area to explore structures.• The children will draw and photograph the structures they have been exploring and label with the correct technical vocabulary in relation to the structure, materials used and shapes.• Children will see how measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools is done.		



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- Children will build and explore a variety of freestanding structures using construction kits, such as wooden blocks, interconnecting plastic bricks and those that make frameworks.
- Children will fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joins. They will think about how folding materials can make them stronger, stiffer, stand up and be more stable.
- Children will decide what the purpose of their product is and decide some simple design criterias.
- As a whole class, they will plan the order in which the structures will be made.
- Children will evaluate their developing ideas and final products against original design criteria.



Skills:

- Observational drawing with some detail.
- Measuring, marking out, cutting, shaping and joining with support using rulers, scissors, glue, sellotape, masking tape and string.
- Improving and evaluating the product.

Sticky knowledge:

- Know who Isambard Kingdom Brunel is.
- Know how to label parts of playground structures.
- Know how they could make a free standing structure stronger, stiffer, stand up and be more stable.



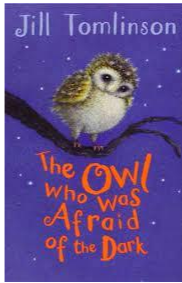
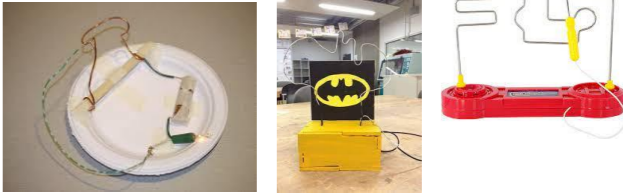
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	<ul style="list-style-type: none"> • Know how to draw, label and order their own design, • Know how they could test their product in order to evaluate if they have been successful. 		
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Curricular Goal			
Provide opportunities to design, make, evaluate, use technical knowledge and learn about cooking and nutrition, sewing and textiles, and mechanisms and structures. Ensure and develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.			
Components: Electrical Systems Year B			
EYFS	KS1	LKS2	UKS2
		<p>Learning objectives:</p> <ul style="list-style-type: none"> • To identify the features of nightlights and investigate their uses. • To investigate how to make an electrical circuit using different materials for switches. • To investigate casings for a night light. • To design a torch for a particular purpose - to plan and sketch a nightlight design in response to the design brief. To include circuit and materials needed. • To be able to make a nightlight using card tube, small boxes, base board, papier-mâché, wire e.g. To include working a circuit inside the nightlight and to modify as required - to meet the design criteria. • To learn how to control devices by turning them on and off according to a sequence of instructions. • To be able to honestly evaluate the final product and to suggest alternative solutions where necessary. 	<p>Learning objectives:</p> <ul style="list-style-type: none"> • To investigate what alarm systems are used for and how different types of switches are activated. • To investigate how to create circuits with a variety of different switches. • To be able to design a steady hand game for a particular purpose. • To be able to create an alarm system based on a design. • To evaluate a finished product.

		<p>Making a night light. Electrical systems.</p>  <ul style="list-style-type: none"> • The children will have the context of the story, “The Owl Who Was Afraid Of The Dark” by Jill Tomlinson, to consider the need for a night light to aid sleep. Hence the design problem of designing and producing a night light for either a peer or a younger child. • The children will independently research a variety of night lights, identifying features and considering their uses. They then either draw and label a diagram of a night light to show its components, or examine and compare a variety of different night lights. They will also have the opportunity to download pictures and designs of night lights to assist in their planning. • Children will consider what components are necessary in the electrical circuit for a night light, and will explore how to make a simple circuit. They will then make and test a variety of switch designs using a range of common objects and materials. Remind them about the dangers of mains electricity. Ensure they avoid making short circuits. Children to write instructions for how to make their switches. • Children will consider what makes a good casing and what materials they may be made from. They may then either investigate using found objects to house a simple circuit, or make 3-D shapes using nets which may be used as casings. • Children will discuss what the terms 'client', 'design brief' and 'design criteria' mean, before looking at and discussing an example of a client's design brief. In their independent 	<p>Making a ‘steady hand game’. Electrical systems.</p>  <ul style="list-style-type: none"> • Children will look at a variety of alarm systems and consider their uses. They may then either discuss and agree upon appropriate alarms for a range of scenarios, or answer questions about a variety of alarm systems. • Children will consider ways in which different switches may be used to control an electrical circuit. They may then either investigate creating working circuits with a variety of switches, or try to create circuits according to given diagrams. • Children will draw and annotate an alarm system design for a ‘steady hand game’. • Referring to previously created designs, children will make models of their own design. • Children will evaluate their own design process and finished product according to a number of given, and agreed upon, criteria. They may either do this individually or in small groups. <p>Skills:</p> <ul style="list-style-type: none"> • To build on knowledge from LKS2 of how to make manually controlled simple series circuits with batteries, bulbs, buzzers, motors and different types of switches. (toggle, push to make, push to break, tilt, reed) • To be able to correct faults in increasingly more complex circuits. • To be able to make a variety of home-made switches using classroom materials (push to make, push to break, tilt) • To be able to join electrical components to ensure secure connections. <p>Knowledge:</p>
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activities, children will choose a client and design a night light for them, thinking about the specific design criteria. The children design and create a sequence of instructions to get the desired outcome. The children can devise more complex instructions depending on their confidence.

- The children make the shade of the nightlight using a variety of materials depending upon their design, papier-mâché, wire, card, cellophane, crepe paper etc. The children will decorate their nightlights accordingly. Children then follow their designs to make their torch for their client, ensuring that they meet the design criteria.
- Children will first discuss the importance of evaluating a finished product, before assessing their client's completed night lights against the design criteria and answering further evaluative questions.



Skills:

- To be able to make a simple circuit, incorporating a battery, light bulb, simple on/off switches and connecting wires.
- To know how to find a fault in a simple circuit.
- Cut, shape, join and finish with some accuracy.

Knowledge:

- To understand that an electrical system is a group of parts (components) that work

- To know that series circuits only have one direction for the electricity to flow.
- To know when there is a break in a series circuit, all components turn off.
- To know that batteries contain acid, which can be dangerous if they leak.
- To know the names of the components in a basic series circuit, including a buzzer.



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		<p>together to transport electricity around a circuit.</p> <ul style="list-style-type: none">● To understand common features of an electric product (switch, battery or plug, dials, buttons etc.).● 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.● To know the features of a night light: case, contacts, batteries, switch, reflector, lamp, lens.● To know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison.	
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