Firs Primary School Subject Curriculum and Progression: Design and Technology

	EYFS	Year 1/2	Year 3/4	Year 5/6
National Curriculum/EYFS Curriculum	**Physical Development ELG** (Fine Motor Skills ELG) Children at the expected level of development will: • Hold a pencil effectively in preparation for fluent writing – using the tripod grip in almost all cases • Use a range of small tools, including scissors, paint brushes and cutlery • Begin to show accuracy and care when drawing. **Expressive Arts and Design ELG** (Creating with Materials ELG) 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	Pupils should be taught to: • 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 • select from and use a range of tools and equipment to perform practical tasks [e.g. 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 • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria • build structures, exploring how they can be made stronger, stiffer and more stable • explore and use mechanisms [e.g. levers, sliders, wheels and axles], in their products • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from	Pupils should be taught to: • 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 • select from and use a wider range of tools and equipment to perform practical tasks [e.g. 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 • 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 • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • understand and use electrical systems in their products [e.g. series circuits incorporating switches, bulbs, buzzers and motors] • apply their understanding of computing to program, monitor and control their products • 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* • <u>understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</u>	

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Key Learning By Topic				
		Enchanted Woodland Children will make a moving picture linked to an aspect of their topic or key text, which incorporates either a lever or slider. • explore and use mechanisms [levers and/or sliders], in their products • select from and use a range of tools and equipment to perform practical tasks [e.g. cutting, shaping, joining and finishing] **Moon Zoom** Children will learn how to make a moving vehicle incorporating wheels and axels. • explore and use mechanisms [wheels and axles], in their products • select from and use a range of tools and equipment to perform practical tasks [e.g. cutting, shaping, joining and finishing] • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology • select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics **Muck, Mess and Mixtures** Children will explore foods from around the world, identifying their countries of origin. They will learn how to sort the foods into food types, and identify which foods are healthy/unhealthy. They will learn to prepare a number of simple healthy dishes from different cultures. • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from • select from and use a wide range of ingredients, according to their characteristics **Street Detective** Children will explore existing road and street signs, identifying their purpose and evaluating their effectiveness. They will then design their own street signs to encourage people to look after the local environment (incorporating the use of ICT). • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria	**I am Warrior (double DT unit)** Children will research, design and make Roman or Celtic shields, evaluating their finished product against the design criteria. They will also follow a simple Roman recipe to make bread, soup or porridge • investigate and analyse a range of existing products • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design • select from and use a wider range of tools and equipment to perform practical tasks [e.g. cutting, shaping, joining and finishing], accurately • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • *prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques* **Playlist** Making instruments: research, develop, design, make and evaluate. • 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 • select from and use a wider range of tools and equipment to perform practical tasks [e.g. 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 • 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 **Tremors** Children will design and build either a model volcano that lights up, or a building that vibrates/shakes as if in an earthquake. • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design • select from and use a wider range of materials and components, including construction materials,	**Frozen Kingdom** Children will work in groups to build large scale shelters (using the outdoor environment if possible) generate, develop, model and communicate their ideas through discussion, • select from and use a wider range of tools and equipment to perform practical tasks [e.g. 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 • apply their understanding of how to strengthen, stiffen and reinforce more complex structures **Bloodheart** Children will investigate and analyse a range of existing food and drinks packaging, considering materials, sustainability, attractiveness and information provided on the label. They will develop design criteria and then design their own packaging for an imaginary food product, using computer aided design techniques. They will evaluate their final design against the design criteria given. • 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 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 **Darwin's Delights** Children will design, build and evaluate mechanical animal models based on the Nuffield DT project. • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design • select from and use a wider range of tools and equipment to perform practical tasks [e.g. 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

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		Land Ahoy Children will investigate a range of materials, exploring their characteristics. They will select the most suitable materials with which to make a model boat; designing, building, testing and evaluating their boat. • generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology • select from and use a range of tools and equipment to perform practical tasks [e.g. 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 **Bright Lights, Big City** Children will learn where bread fits within the healthy food wheel. They will learn about different types of bread and which are most/least healthy. They will learn to make bread using a simple recipe/ • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from **Superheroes** Children will learn about the healthy food wheel/pyramid. They will learn where meat comes from, matching meat products to the animals they come from. They will learn how to make healthy snacks using fresh, unprocessed ingredients. • use the basic principles of a healthy and varied diet to prepare dishes • understand where food comes from • select from and use a wide range of ingredients, according to their characteristics **Scented Garden** Children will explore a range of commercially available bug hotels and use these to establish design criteria for their own bug hotel. They will collect a range of natural and recycled materials and use these to make their own • explore and evaluate a range of existing products • evaluate their ideas and products against design criteria • select from and use a range of tools and equipment to perform practical tasks [e.g. 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 • build structures, exploring how they can be made stronger, stiffer and more stable	textiles and ingredients, according to their functional properties and aesthetic qualities • understand and use electrical systems in their products [e.g. series circuits incorporating switches, bulbs, buzzers and motors] **Burps, Bottoms, Bile** Children will learn about healthy and unhealthy food groups. They will learn about where different meats, fruits and vegetables come from, examining the difference between intensively reared meats and sustainable, organic and/or free-range farming methods. They will learn that fresh food is healthier than processed foods and will examine the sugar content of a range of popular drinks and snacks. They will learn how to make healthy snacks, with no added sugar. • *prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques* • <u>understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</u> • 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 • understand and apply the principles of a healthy and varied diet **Mighty Metals** Children will learn how to build and program a simple robot using a robotics kit. • 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 • apply their understanding of computing to program, monitor and control their products **Blue Abyss** Children will learn about Cornelius Drebbel and the invention of the Submarine, looking at the changes and improvements to Drebbel's initial design over time by other inventors/engineers, and the impact that his invention has had on the world in different contexts e.g. the use of submarines in war, science and conservation. • understand how key events and individuals in design and technology have helped shape the world	functional properties and aesthetic qualities • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work **Off With Her Head** Children will prepare and cook a Tudor stew using seasonal vegetables • 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* • <u>understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed</u> • 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 **Pharohs** Understand and use electrical systems in products made: design and make a board game including lights, switches, buzzers or motors. • understand and use electrical systems in their products [e.g. series circuits incorporating switches, bulbs, buzzers and motors] • investigate and analyse a range of existing products • 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 • select from and use a wider range of tools and equipment to perform practical tasks [e.g. 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 their ideas and products against their own design criteria and consider the views of others to improve their work

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		Towers, Turrets and Tunnels Children will explore a variety of materials and construction techniques in order to design and build either a tower or bridge to solve a problem e.g. a bridge to reach between two tables for a model car to drive over, or a high tower to keep the treasure safe. • build structures, exploring how they can be made stronger, stiffer and more stable • evaluate their ideas and products against design criteria • select from and use a range of tools and equipment to perform practical tasks [e.g. 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		**Time Traveller (cross-curricular unit with art and design)** Children will design a house based on a great architect's design style (e.g. arts and crafts, brutalist, art deco etc), specifying materials in the design and examining cost effectiveness. They will build a model of their design either practically or using computer aided design. They will learn about how architectural styles have developed in response to changes in society over time understand how key events and individuals in design and technology have helped shape the world • generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design • select from and use a wider range of tools and equipment to perform practical tasks [e.g. 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 • 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

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Progression in Skills

Design			
	• State the purpose of the design and the intended user • Explore materials, make templates and mock ups e.g. moving picture / lighthouse • Generate own ideas for design by drawing on own experiences or from reading	• Gather information about the needs and wants of particular individuals and groups • Develop their own design criteria and use these to inform their ideas • Research designs • Share and clarify ideas through discussion • Model their ideas using prototypes and pattern pieces • Use annotated sketches, cross-sectional drawings and diagrams • Use computer-aided design	• Carry out research, using surveys, interviews, questionnaires and web-based resources • Identify the needs, wants, preferences and values of particular individuals and groups • Develop a simple design specification to guide their thinking • Recognise when their products have to fulfil conflicting requirements • Generate innovative ideas, drawing on research Make design decisions, taking account of constraints such as time, resources and cost • Develop prototypes
Make			
	• Select from a range of tools and equipment explaining their choices • Select from a range of materials and components according to their characteristics • Follow procedures for safety • Use and make own templates • Measure, mark out, cut out and shape materials and components • Assemble, join and combine materials and components Use simple fixing materials e.g. temporary – paper clips, tape and permanent – glue, staples • Use finishing techniques, including those from art and design	• Select tools and equipment suitable for the task • Explain their choice of tools and equipment in relation to the skills and techniques they will be using • Select materials and components suitable for the task • Explain their choice of materials and components according to functional properties and aesthetic qualities Order the main stages of making • Produce detailed lists of tools, equipment and materials that they need • Follow procedures for safety • Use a wider range of materials and components, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components	
		• Measure, mark out, cut and shape materials and components with some accuracy • Assemble, join and combine materials and components with some accuracy apply a range of finishing techniques, include those from art and design, with some accuracy	• Accurately measure to nearest mm, mark out, cut and shape materials and components • Accurately assemble, join and combine materials/ components • Accurately apply a range of finishing techniques, including those from art and design • Use techniques that involve a number of steps Demonstrate resourcefulness, e.g. make refinements
Evaluate			
	• Talk about their design ideas and what they are making • Make simple judgements about their products and ideas against design criteria • Suggest how their products could be improved Evaluating products and components used • Investigate - what products are, who they are for, how they are made and what materials are used	• Identify the strengths and weaknesses of their ideas and products • Consider the views of others, including intended users, to improve their work • Refer back to their design criteria as they design and make • Use their design criteria to evaluate their completed products • Investigate - how well products have been designed, how well products have been made, why materials have been chosen, what methods of construction have been used, how well products work, how well products achieve their purposes and how well products meet user needs and wants • Identify great designers and their work and use research of designers to influence work	
		• Identify the strengths and weaknesses of their ideas and products • Consider the views of others, including intended users, to improve their work • Investigate - who designed and made the products, where products were designed and made, when products were designed and made and whether products can be recycled or reused •	• Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • Compare their ideas and products to their original design specification • Investigate - how much products cost to make, how innovative products are and how sustainable the materials in products are

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<tr><td></td><td colspan="3">Technical Knowledge</td></tr>
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Understand about the simple working characteristics of materials and components
Understand about the movement of simple mechanisms including levers, sliders (Year 1) wheels and axles (Year 2)
Understand that food ingredients should be combined according to their sensory characteristics
Know the correct technical vocabulary for the projects they are undertaking
Understand how freestanding structures can be made stronger, stiffer and more stable

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Understand how to use learning from science and maths to help design and make products that work
Know that materials have both functional properties and aesthetic qualities
Know that materials can be combined and mixed to create more useful characteristics
Know that mechanical and electrical systems have an input, process and output
Use the correct technical vocabulary for the projects they are undertaking

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Understand how levers and linkages or pneumatic systems create movement
Understand how simple electrical circuits and components can be used to create functional products
Understand how to program a computer to control their products
Know how to make strong, stiff shell structures
Know that a single fabric shape can be used to make a 3D textiles product
Know that food ingredients can be fresh, pre-cooked and processed

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Understand how cams, pulleys and gears create movement
Understand how more complex electrical circuits and components can be used to create functional products
Understand how to program a computer to monitor changes in the environment / control their products
Know how to reinforce/strengthen a 3D framework
Know that a 3D textiles product can be made from a combination of fabric shapes
Know that a recipe can be adapted a by adding or substituting one or more ingredients

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<tr><td></td><td colspan="3">Cooking and Nutrition</td></tr>
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Know where food comes from
Use appropriate equipment to weigh and measure ingredients
Prepare simple dishes safely and hygienically, without using a heat source
Use techniques such as cutting
Name and sort foods into the five groups of the ‘eat well’ plate
Know that everyone should eat at least five portions of fruit and vegetables every day

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Know that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world
Know that seasons may affect the food available
Understand how food is processed into ingredients that can be eaten or used in cooking
How to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source
How to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking

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Know that a healthy diet is made up from a variety and balance of different foods and drinks, as depicted in the ‘eat well’ plate
Know that to be active and healthy, food is needed to provide energy for the body
Measure using grams
Follow a recipe

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Know that recipes can be adapted to change the appearance, taste, texture and aroma
Know that different foods contain different substances - nutrients, water and fibre - that are needed for health
Understand the need for correct storage
Measure accurately
Work out ratios in recipes

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Vocabulary (Tier 2 and 3)		**Enchanted Woodland** mechanisms levers sliders tools cutting joining glue tape shaping finishing scissors movement evaluate **Moon Zoom** wheels axels measure saw scissors cut join glue tape faster slower design materials wood card plastic elastic band characteristics evaluate **Muck, Mess and Mixtures** healthy balanced varied diet location origin healthy unhealthy cultures traditions/traditional ingredients measure taste sweet salty sour sort	**I am Warrior (double DT unit)** research design make evaluate strengths weaknesses design criteria pattern colour material wood card metal plastic strong weight recipe savoury measure weigh hygiene peeling chopping slicing grating mixing spreading kneading ingredients baking **Playlist** design make evaluate research design criteria materials purpose sketch materials aesthetic functional improve strengths weaknesses users instrument noise sound **Tremors** design make construct	**Frozen Kingdom** design criteria communicate discuss tools equipment cutting joining materials functional strengthen stiffen reinforce structure weatherproof waterproof water resistant insulating shelter **Bloodheart** investigate analyse research packaging materials sustainability aesthetic appeal/appealing design criteria design evaluate computer aided design information labelling sustainable recyclable cost effective **Darwin's Delights** design construct evaluate design criteria diagram gears pulleys cams levers

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		hygiene **Street Detective** road sign street sign warning information persuasion design environment purpose audience effectiveness design attractive bright template evaluate **Land Ahoy** materials plastic paper fabric card metal wood heavy light float sink waterproof water resistant dissolve evaluate characteristics **Bright Lights, Big City** bread healthy unhealthy grain flour recipe mix stir measure weigh ingredients	materials components electrical circuit wires batteries cells bulbs buzzer motor light shake vibrate **Burps, Bottoms, Bile** healthy unhealthy varied diet food wheel/pyramid sweet savoury sour seasonal grown reared caught processed fresh pre-prepared intensive farming factory farming sustainable farming/fishing organic free range ingredients weigh measure hygiene peeling chopping slicing grating mixing spreading kneading baking recipe grams tea spoon table spoon	linkage stiffen reinforce materials aesthetic function joining mechanical prototype **Off With Her Head** locally produced chicken/vegetable/beef stock ingredients weigh measure hygiene peeling chopping slicing grating mixing grams taste colour texture hygiene healthy varied diet savoury sweet sour **Pharohs** electrical circuit wires switches buzzers motors bulbs batteries cells parallel circuit series circuit user purpose aesthetic design design criteria make evaluate strengths

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		bake temperature oven safety hygiene whisk dough knead wholemeal white **Superheroes** meat fruit vegetables farming fresh chicken pork beef fish eggs sheep cows pigs healthy unhealthy balanced varied diet sugar grain ingredients characteristics recipe measure weigh mix **Scented Garden** design evaluate natural recycled materials join build stick cut glue	**Mighty Metals** computing program monitor control functional robot components debug **Blue Abyss** submarine inventor/invention uses science war navy conservation prototype dive weights engineer submerge surface power	weaknesses components diagram prototype existing products research functional **Time Traveller (cross-curricular unit with art and design)** architect/architecture style movement research investigate analyse design build evaluate design criteria design floorplan strengthen stiffen reinforce Art-deco Brutalist Gothic Contemporary Tudor Victorian Classical Sustainable Materials

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		tape plastic wood sticks stones leaves bug hotel characteristics **Towers, Turrets and Tunnels** build stiffer stronger stable evaluate design tall long cutting joining bridge tower bricks construct characteristics		