Bredbury Green Primary School: Rationale Behind The Design and Technology Curriculum

	What we teach? (Minimum Requirement From NC)	Component Knowledge	Why we teach it now? (Rationale)	Key Vocabulary
Early Years	**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 **Fine Motor Skills** • Use a range of small tools, including scissors, paintbrushes and cutlery • Begin to show accuracy and care when drawing **Links to PSED** • Making healthy choices about food and drink **Article 17, Access to information from the media. Creating with Materials** **What can you make using different colours and materials?** **How did you make your creation, and what did you use?** **Fine Motor Skills** **Can you use scissors or a paintbrush carefully to make your picture?** **How can you be careful when drawing or using small tools?** **Links to PSED – Healthy Choices** **What foods and drinks are healthy for you?** **Why is it good to choose healthy food and drink?**	**Creating with Materials** • know what materials and tools they need to carry out their idea/ design • know how to join materials together to create a structure • know how to safely use scissors • talk and evaluate their designs **Fine Motor Skills** • use the correct grip when using scissors and other small tools • use the correct grip while writing and drawing	**Developing vocabulary in Nursery & Reception** Build, make, join, materials, design, senses, tools, safe, careful, purpose, reason, feeling, texture, see, hear, taste, touch, hygiene, healthy, unhealthy	
Year 1 (when appropriate)	**STEM Science – Visitor to school** **POWER & INFLUENCE** • **Explore and use mechanisms** [for example, **levers**, sliders, wheels and **axles**], in their products. • Explore mechanisms and their effects • Use mechanisms to create a mechanical Ferris wheel • Discuss how ICT has helped to make the product	• Know what a lever is. • Know what a wheel is. • Know what a slider is. • Know what an axle is. • Know what a mechanism is and what it does. • Know what products have mechanisms in them. • Know what a Ferris wheel is. • Know what technology is and how is has been used to make the Ferris Wheel (link to computing unit)	• Builds upon: In reception and nursery pupils learnt how to safely use a variety of materials, tools and techniques. Pupils shared their creations and used a range of small tools including scissors, paintbrushes and cutlery. • Prepares for: In Y2 pupils will develop an understanding of mechanisms, structures and vocabulary. Pupils will build structures, exploring how they can be made stronger, stiffer and more stable. This also links to the study of the local area which explores the changing area e.g. horse and cart to cars and development of technology over time.	Lever Pulley Mechanism Program Speed Rotation

Year 1 **Spring**	**Jamaican food tasting** **SIGNIFICANCE & APPRECIATION** • **Understand where food comes from** • Taste a variety of food typically from Jamaica • Make comparisons to food typically from England • Identify why different types of foods come from different places **Article 24, Health** **Where does this food come from?** **How is this food the same or different from food we usually eat in England?** **Why do different countries have different kinds of food?**	• Understand where Jamaica is and how it is different to England. • Understand where different types of food comes from (on trees, underground, etc) • Know what food we typically eat in England. • Know how to compare food from different places and cultures by discussing taste, texture and how it was grown/made. • Know why different food is grown in different countries.	• Prepares children for Year 2 Healthy eating focus and creation of smoothies, developing vocabulary • Children will use Jamaican knowledge to compare other cultures in Y2-6	Sweet Sour Salty Savoury Recipe Ingredients Exotic Hygiene
Year 1 **Summer**	**Lowry structures** **STRUCTURES & CAUSE AND EFFECT** • **design purposeful, functional**, appealing products **for themselves** and other users based on design criteria • **select from and use** a range of tools and **equipment** to perform practical tasks [for example**, cutting,** shaping, **joining** and finishing] • **select from and use a wide range of materials** and components, including **construction materials**, textiles and ingredients, according to their characteristics • **explore and evaluate a range of existing products** • Research buildings and evaluate existing structures • Design a building to meet design criteria • Consider materials and how to cut and join in different ways	• Know what a structure is. • Know what a building is and famous structures such as the Eiffel Tower, Manchester United football stadium and Morrisons. • Compare how these structures are different in appearance, size and material/design. • Know who Lowry is and why he is famous. • Know Lowry's style of art and design. • Understand what Lowry's buildings look like in his paintings. • Know how to design a building that looks similar to Lowry's work. • Know which materials are suitable for a structure such as cardboard, plastic and other sturdy materials. • Know how to cut and join materials, building on their learning from Reception.	• Builds upon: Reception create rockets and children will continue their understanding of structures through the structures related to Lowry • Prepares for: Year 2 study local area studies of buildings and understanding how to join simple structures will support understanding in Year 3 and 4 curriculum	Sturdy Joint Structure Factory Terrace Material Design
Year 2 **Autumn** **(Forest School Link)**	**Hedgehog microhabitat** **STRUCTURES & INFLUENCE** • 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 [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 their ideas and products against design criteria	Research a range of existing products • Use and ICT device to find existing products. Research and develop design criteria • Use existing products to inform their product designs Design • To draw and label a design to support the making of a product. Create a product (hedgehog home) • To sort materials into natural and man-made. • Choose appropriate materials and tools to make a product suitable for its need and location. Evaluate their product to discuss next steps • Discuss what they liked/did not like about the final product. • Discuss next steps to improve the product for next time.	• Builds upon Year 1 where children design purposeful and functional products by selecting and using a wide range of materials to make a Lowry house. • Prepares for Year 3 where children will design and make a scutum based on a design brief.	*Sturdy* *Joint* *Structure* *Material* *Design* Natural Man-made Research Camouflage Criteria Stability

	• Research, using ICT, hedgehog habitats and compare man-made and natural to create a design according to a set criteria • Create a microhabitat using a range of natural materials • Evaluate their creation and provide next steps			
Year 2 **Summer**	**Healthy eating** **SIGNIFICANCE & POWER** • Use the basic principles of a healthy and varied diet to prepare dishes • select from and use a wide range of materials and components, including construction materials, textiles and **ingredients, according to their characteristics** • Know the principles of a healthy and varied diet • Design a main and desert that reflect a healthy and varied diet • Prepare the main and desert designed for their peers **Article 24, Health** **How do the ingredients we choose help make our dishes healthy? What did you like about your dish and your friends' dishes?**	Know the principles of a healthy and varied diet • To know what foods to eat most of and what to eat little of (linked to Science). Design a main and dessert • To understand the meaning of main meal and a dessert. • To use prior knowledge of healthy foods to design their own menu. • To have an understanding of what ingredients different foods have. Prepare the main and dessert • Use cooking equipment and utensils safely to prepare each meal. • Taste the prepared and cooked meal. **YUMMY!** ☺	• Builds upon Year 1 where children explore food from other cultures and taste. • Prepares for Year 3 where children will create pizzas by applying the principles of healthy and varied document.	*Sweet* *Sour* *Salty* *Savoury* *Recipe* *Ingredients* *Exotic* *Hygiene* Healthy Unhealthy Diet Vegetables Fruit Salty/sweet/sour
Year 2 (when appropriate) **Spring**	**STEM car – visitor to school** **STRUCTURES & CAUSE AND EFFECT** • Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products. • Explore mechanisms and their effects • Use mechanisms to create a mechanical car wheel • Discuss how ICT has helped to make the product	Explore mechanisms and their effects • Discuss the parts of the car being made and what parts help it to move. Use mechanisms to create a mechanical car wheel • Follow instructions to be able to make a mechanical car. Discuss how ICT has helped to make the product • Discuss the effects of the program buttons and how to sequence these. • Identify bugs and discuss how to correct them.	• Builds upon Year 1 where children explored and used levers and axels. • Prepares for Year 3 where children will explore existing products and how they were designed to fit purpose.	*Lever* *Pulley* *Mechanism* *Program* *Speed* *Rotation* Coding Program Structure Mechanism Speed Rotation Debug Movement Wheel
Year 3 **Autumn**	**Healthy eating – creating pizzas** **APPRECIATION & CAUSE AND EFFECT** • Understand and apply the principles of a healthy and varied diet • Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. • Understand and apply the principles of a healthy and varied diet to their own savoury Pizza design • Consider seasonality of ingredients and food groups when designing	Develop awareness of a range of cooking techniques • Select and prepare ingredients • Select appropriate utensils and be able to name these • Demonstrate a range of techniques such as rolling, kneading and proving • Understand the importance of rolling, needing and proving Understand seasonality and healthy diets • Understand that pizza dough is a nutritional food source (carbohydrate). • Identify the four seasons and what vegetables can be grown in each season. Talk about how dairy is not seasonal. • Link to the five food groups and why it is important to have variety to ensure a healthy balanced diet.	• Link to Science Healthy eating and food groups • Link to History – Roman focus in Spring term Y3 • Build upon knowledge from Year 2 on types of food and evaluation • Prepares for baking Egyptian bread in Year 4	*Healthy* *Unhealthy* *Diet* *Vegetables* *Fruit* *Salty/sweet/sour* Savoury Seasonal Food groups Ingredients Evaluation Duration Kneading Weighing Temperature Texture

	• Make and evaluate savoury dish using appropriate vocabulary and considering next steps **Article 24, Health** **How can we choose healthy ingredients to make our pizza?** **Why is it important to think about different food groups and seasonal ingredients?**	<u>Evaluate their product to discuss next steps</u> • Discuss what they liked/did not like about the final product • Discuss any problems they faced and how they overcame these • Know and use the correct vocabulary when describing the baking process		
Year 3 **Spring**	**<u>Roman army – Scutum</u>** **STRUCTURES & POWER** • 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 • select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Research different structures and which ensure strength and stiffness • Design their own Scutum based upon existing criteria and discuss resources they would require • Develop their own Scutum and evaluate, referring to criteria and design **Article 38, War and armed conflict** **How do we make a shield strong and stiff enough to protect someone?** **What can we learn from existing shields to help us design our own?**	Structures: • Build up in layers and levels to ensure stiffness • Add supports to the structure to ensure strength Design structure: • Bos • Colour – yellow and red • Designs showing victory: an eagle with a laurel wreath, winged Victories, and a lion. Resources: • Cardboard • Mod roc • Paint • Duct tape <u>Evaluate their product to discuss next steps</u> • Discuss what they liked/did not like about the final product • Discuss any problems they faced and how they overcame these • Know and use the correct vocabulary when describing the scutum and how it was designed	• Builds upon prior learning in Year 1 of materials and properties • Prepares for: Understanding materials and strength will support learning of Anglo Saxons in Year 4 and Vikings in Year 5.	*Research* *Criteria* *Stability* Strength Stiffen Design Criteria Scutum Structure Bos
Year 3 **Summer** **(Forest School Link)**	**<u>Stone Age Tool Making</u>** **INFLUENCE & SIGNIFICANCE** • understand how key events and individuals in design and technology have helped shape the world • select from and use a wider range of tools and equipment to perform practical tasks • investigate and analyse a range of existing products • Explore and evaluate tools currently available for specific purposes • Compare to tools from Stone Age • Use tools competently and accurately for a specific purpose	Forest school: • Explore the area and look for materials that could be used for making tools • Discuss tools that are currently used (hammer, drill, screwdriver, axe, touch) compare to Stone Age (spear, wood torch with fire, hammer, axes) – look at construction and materials used • Make a Stone Age tool using materials found in the forest (hammer) and evaluate its effectiveness	• Builds upon forces and materials learning in Spring term Y3 • Prepares for building and using functional tools in forest school, namely building Anderson shelters in Year 6	*Structure* *Mechanism* *Rotation* *Movement* *Wheel* Rotation Purpose Outcome Tread Force Material Investigate
Year 4	**<u>Ancient Egyptian- Bake Ancient Egyptian bread</u>**	<u>Develop awareness of a range of cooking techniques</u>	• Builds upon making healthy pizzas in Year 3 and science	Utensils Texture

Spring	**CAUSE AND EFFECT & APPRECIATION** • prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. • 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 • Develop awareness of a range of cooking techniques eg selecting and preparing ingredients, using utensils, being aware of taste, texture and smell to decide how to season dishes season dishes • Understand seasonality and availability of ingredients in order to design their dish • Evaluate their product and use tier 3 vocabulary to discuss next steps	• Select and prepare ingredients • Select appropriate utensils and be able to name these • Demonstrate a range of techniques such as rolling, kneading and proving • Understand the importance of rolling, needing and proving <u>Understand seasonality and availability of ingredients</u> • Understand that bread is a nutritional food source and ingredients are available all year round <u>Evaluate their product to discuss next steps</u> • Discuss what they liked/did not like about the final product • Discuss any problems they faced and how they overcame these • Know and use the correct vocabulary when describing the baking process	knowledge about healthy eating • Prepares for making hummus in Year 5 – food linked with an ancient civilisation	Season Product Ingredients Preparing Evaluate Kneading Weighing Temperature Rise
Year 4 **Summer**	**<u>Thomas Edison – Electrical components</u>** **Make an electrical circuit linked to visit** **POWER & STRUCTURE** • Investigate and analyse a range of existing products • understand how key events and individuals in design and technology have helped shape the world • understand and use electrical systems in their 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 materials and components • • Investigate and analyse a range of existing products • Research and develop design criteria to inform the design	<u>Investigate a range of existing products</u> • Use a variety of sources to research what makes a successful product <u>Research and develop design criteria</u> • Use existing products to inform their product designs <u>Create annotated sketches of their product</u> • Understand and use correct vocabulary within their sketches <u>Create an electrical circuit</u> • Demonstrate an understanding of the role of each component • Understand the impact of adding or taking away different components to the circuit <u>Program, monitor and control their products</u> • Children to collate their understanding to produce a fully functioning product	• Linked to History – Significant individual and event that has had an impact on British history. • Builds upon Year 4 Science – electricity, constructing a simple series of electrical circuits. • Prepares for learning about electricity in Science in UKS2 and making a torch in DT in Y6	Design criteria Product Annotate Components Circuit Investigate Electrical Appliances

	of an innovative functional product • Create annotated sketches of their product • Select from a wider range of components to create their electrical circuit • *Apply their understanding of computing to program, monitor and control their products*			
Year 5 **Spring**	**<u>Ancient Greeks – Hummus</u>** **CAUSE AND EFFECT & APPRECIATION** • Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques • 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 • Research and explore the origin of some UK foods and make links to Ancient Greece • Build a working knowledge of how to produce savoury Greek dishes • Compare impact of different ingredients on the flavour outcomes of the hummus **<u>Article 24, Health</u>** **How can we make a Greek dish safely and successfully?** **What happens to the flavour when we use different ingredients in hummus?**	<u>Investigate a range of existing products</u> • Taste, rate and identify flavours of some Greek dishes (hummus, flatbread, pittas, feta cheese, Greek yoghurt, olive oil) • Understand where some key ingredients come from – yoghurt, feta cheese, olive oil <u>Recipe Exploration</u> • Compare recipes for different variations of hummus / flatbread <u>Prepare and make</u> • Prepare and make a simple hummus • Add additional flavourings according to preference <u>Evaluate</u> • Identify what helped and what hindered when making the hummus	• In History, the children will be learning about the Ancient Greeks. In order to support the children to build connectivity between the ancient civilisation and the children's experience of modern day Greek life, they will have the opportunity to taste and prepare Greek food. • This will build upon their learning from Year 1, where children were tasting Jamaican food. It will also build upon the food technology units taught within KS2. • This will prepare children for the KS3 objective: cook a repertoire of predominantly savoury dishes so that they are able to feed themselves and others a healthy and varied diet	Savoury Techniques Prepare Cook Dishes Pestle Mortar Blend Rise Yeast
Year 5 **Summer**	**<u>Viking Longships</u>** **SIGNIFICANCE & STRUCTURE** • 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 [for example, cutting, shaping, joining and finishing], accurately • understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • evaluate their ideas and products against their own design criteria and consider the views of others to improve their work • Design a Viking Longship through annotated sketches and exploded diagrams • Use knowledge of pulleys and levers from science to	<u>Design</u> • Use annotated sketches and exploded diagrams to design own Viking Longship <u>Skills</u> • Understand how a pulley works and create one • Understand how a lever works and create one • Plan how to use a pulley or a lever to make a moving part as part of the Viking Longship <u>Tool Skills</u> • Use a junior hacksaw to size parts of the Viking Longship <u>Make</u> • Follow steps to make Viking Longship adhering to designs and using taught skills • Adapt designs based upon need <u>Evaluate</u> • Consider any adaptations that were needed and reasons why • Consider top tips for next year's children when making Viking Longships	• Builds upon: Children will have already practised some of the pre-requisite skills associated with carving in Year 4 through their printing of Anglo Saxon brooches in art. • Prepares for KS3 objective: understand and use the properties of materials and the performance of structural elements to achieve functioning solutions	Carving Planning Finishing Joining Shaping Cutting

	create a mechanical element in the design - Utilise tools to make the Viking Longship and evaluate their effectiveness			
Year 6 **Autumn**	**<u>Mexico Farming Process</u>** **SIGNIFICANCE & STRUCTURE** • Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. • Understand that specific ingredients are sourced in specific places and why this impacts upon what can be made. • Compare and contrast ingredients from Mexico and Britain • Recognise and discuss a range of dishes made with these ingredients -	•	• Builds upon: In Geography, children will be learning about the subsistence farming process in Mexico and how this allows Mexico to produce enough to keep its people well fed, based on the farming process in terraces. • Children will understand the difference between what is grown abroad and what can be grown in Britain. This will prepare them for their introduction to rationing and understanding how seasonality, variety and location would have been relevant to the Women's Land Army. • Based on their understanding with regards to subsistence farming in Mexico, children will build a wider awareness of available ingredients, selecting from those that would have been available during WW2. • Prepares for KS3 objective: understand the source, seasonality and characteristics of a broad range of ingredients.	Seasonality Availability Shortage Production Variety Location Preparation
Year 6 **Spring** **(Possible Forest Link)**	**<u>Anderson Shelters</u>** **CAUSE AND EFFECT & INFLUENCE** • 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 • Understand how key events and individuals in design and technology have helped shape the world • Understand how Anderson Shelters were designed in order to build its strength and ability to protect people in WW2 • Explore materials and select the ones most suited to the product • Evaluate final product **<u>Torch Making</u>** **POWER** • Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • Show an awareness of the real life application of	• Explain or demonstrate the words: aesthetic, functional, strengthen, stiffen, reinforce, complex and structures • Understand that if a flat object is folded repeatedly, it creates a concertina. When this concept applies to the Anderson Shelter, the iron is corrugated. This increases strength due to having a larger surface area. • Describe an Anderson Shelter and its function • Create a mock-up of an Anderson Shelter using paper folding techniques to replicate reinforcement and the aesthetic of the original. • Design a real Anderson Shelter, selecting the most suitable materials for this. • Assemble a larger scale version outside. Compare this to the design, using the words aesthetic, functional, strengthen, stiffen, reinforce, complex and structures. • Exposure to Electricity Workshop – Morse Code machine • Show secure understanding of circuits, in line with the Science curriculum • Design a suitable circuit which would allow a torch to work	• Builds upon: In Year 1, the children will have focused on making building using cardboard and this will be the beginning of building their awareness of creating a sturdy structure. They will have also built their own tools in forest school in Y4. • Prepares for KS3 objective: develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations • Builds upon learning in Science in KS2 – light and electricity • Prepares for KS3 objective: select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties	Ingredients Components Aesthetic Functional Strengthen Stiffen Reinforce Complex Structures Protection Properties Circuit Electrical systems Products Series Circuits ergonomic

	electrical systems within the time period of WW2 • Use prior knowledge of electricity to support designs • Evaluate final product **<u>Article 38, War and armed conflict</u>** **How can we design and build electrical systems inspired by WW2, and what can we learn about the role of technology during times of war?**	• Make this using crocodile clips, wires, cells and a bulb with accuracy and confidence • Consider the material for the casing and the need to make the torch ergonomic		
Year 6 **Summer**	**<u>Propaganda Poster</u>** **APPRECIATION** • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design • Show an awareness of the design process behind the production of an effective propaganda poster • Understand how the design process builds and how different elements can communicate ideas • Use computer aided design to support **<u>Article 13, Feedom of expression.</u>** **How can we use the design process and computer tools to create a propaganda poster that shares** ideas clearly?	• Share an understanding of what is meant by propaganda and how it was presented during WW2, using this as a model for the development of ideas within a different context • Understand what is meant by a font and how different fonts can suggest different levels of professionalism, clarity and seriousness • Use the design brief provided in order to generate propaganda which meets the aims of the creator of the brief • Create sketches to show a wide lensed view of how the poster is likely to look as a whole, using minimal detail and annotating for clarity • Use computer aided design to develop a cross-sectional, exploded diagram. Add detail to this section using the iPad.	• Builds upon knowledge gained in art and history to understand the purpose of propaganda • Prepares for KS3 objectives: use research and exploration, such as the study of different cultures, to identify and understand user needs and ♣ develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools	Generate Develop Model Communicate Ideas Annotated Sketches Cross-sectional Exploded diagrams Prototypes Computer aided design