Design and Technology
Long Term Plan

Key Stage 2
Design • Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups. • Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design. Make • Select from and use a wider range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing), accurately. • Select from and use a wider range of materials, textiles and ingredients, according to their functional properties and aesthetic qualities. Evaluate • Investigate and analyse a range of existing products. • Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. • Understand how key events and individuals in design and technology have helped shape the world. Technical Knowledge • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand and use mechanical systems in their products (for example gears, pulleys, cams, levers and linkages). • Understand and use electrical systems in their products (for example series circuits incorporating switches, bulbs, buzzers and motors). • Apply their understanding of computing to programme, monitor and control their products. Cooking and nutrition • Understand and apply the principles of a healthy and varied diet. • Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques. • Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

DESIGN AND TECHNOLOGY			
Year	Autumn	Spring	Summer
3	English- Starbird *Structures and Textiles* **Design and make your own bookmark for a member of your class.** Cut materials accurately and safely by selecting appropriate tools. Measure and mark out accurately. Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs). Select appropriate joining techniques.	English *Mechanical Systems* **Design, make and evaluate a pneumatic prop to use alongside your current reading book.** Explore different pneumatic techniques. Discuss the transference of forces. Selecting from and using appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons. Demonstrate a working pneumatic system. Use finishing and decorative techniques suitable for their product.	PSHE/ Science *Cooking and Nutrition* **Design, make and evaluate a healthy snack for a peer.** Understand and apply the principles of a healthy and varied diet. Use an existing recipe to practice food preparation and cooking techniques. Measure and weigh ingredients. Use seasonality to select ingredients. Discuss basic food hygiene skills.
	<u>Design:</u> • Investigate existing products, including drawing them to analyse and understand how they are made. • Begin to understand how to make a design brief. • Develop more than one design.	<u>Evaluate:</u> • Identify strengths and weaknesses of their design ideas. • Talk about how closely their finished product meets their design criteria and meets the need of the user. • Refine work and techniques as work progresses, continually evaluating the product design.	

4	Science - Electricity *Electrical systems* **Design, make and evaluate your own brush monster for a Year 3 pupil.** Discuss the transference of forces to choose appropriate mechanisms for a product. Understand and create a simple circuit to use in their designs. Design innovative, functional, appealing products that are fit for purpose. Ensure products have a high-quality finish, using art skills where appropriate.	History- Romans *Mechanical systems* **Design, make and evaluate a pop-up book inspired by the day in the life of a Roman soldier for a museum to put on display.** Cut slots and internal shapes. Use lolly sticks/cards to make levers and linkages. Use linkages to make movement larger or more varied. Use and explore more complex pop-ups. Measure and mark out to the nearest millimetre. Ensure products have a high-quality finish, using art skills where appropriate.	*Structures and Textiles* **Design, make and evaluate a working bridge in order to support a specific weight and purpose.** Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques. Make products through stages of prototypes, making continual refinements. Investigate how to make structures more stable e.g. by widening the base. Strengthen frames by using diagonal struts.
	<u>Design:</u> • Investigate existing products, including drawing them to analyse and understand how they are made. • Begin to understand how to make a design brief. • Develop more than one design.		<u>Evaluate:</u> • Identify strengths and weaknesses of their design ideas. • Talk about how closely their finished product meets their design criteria and meets the need of the user. • Refine work and techniques as work progresses, continually evaluating the product design.

5	History- Anglo-Saxons *Structures and Textiles* **Design, make and evaluate an Anglo-Saxon village to show what life was like.** Investigate and evaluate a range of existing frame structures. Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. Ensure their products are stable and secure by carefully selecting joining techniques. Use finishing and decorative techniques suitable for the product they are designing and making.	Science- Materials *Structures and Textiles* **Design, make and evaluate a bag for a specific person and purpose.** Use a range of materials and joining techniques based on their suitability and aesthetic qualities. Demonstrate a variety of fastening and joining techniques to join fabrics for different purposes. Cut materials with precision and refine the finish with appropriate tools (textiles). Create a textiles product pattern. Use finishing and decorative techniques suitable for the product they are designing and making.	*Electrical systems* **Design, make and evaluate a robot that can be controlled by a computer programme for a specific purpose.** Understand and use electrical systems in their products including, switches, buzzers and motors. Understand and create a simple circuit to use in their designs. Apply their understanding of computing to program, monitor, and control their products. Join materials using appropriate methods. To create a 2D pattern to create a 3D shape. Use finishing and decorative techniques suitable for their product.
	<u>Design:</u> • Undertake research to inform design process. This may include surveys and interviews. • Create design briefs • Use prototypes, cross-sectional diagrams, computer-aided design and exploded diagrams to represent designs. • Complete research into key events and individuals.	<u>Evaluate:</u> • Consider the views of others when evaluating their own work. • Ensure products have a high-quality finish, using art skills where appropriate. • Justify their decisions about materials and methods of construction. • Make suggestions on how their design/product could be improved.	

6	History- Victorians *Mechanical Systems* **Design, make and evaluate a Victorian Zoetrope for a child to use.** Design and make a Zoetrope based on a cylinder or prism and decide how many viewing slots and animation frames to use. Decide on a theme for the animation and draw an outline for the frames making sure there are the right number of frames, the total length is equal to the perimeter of the Zoetrope and the frame height is not such that it blocks off the viewing slots. Make products through stages of prototypes, making continual refinements. Ensure products have a high-quality finish, using art skills where appropriate.	Science *Electrical Systems* **Design, make and evaluate a working electrical car for TESLA to use as a prototype.** Create circuits using electronics kits that employ a number of components Attach gear wheels to a base / model using an axel. Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques. Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product. Build frameworks using a range of materials. Cut materials with precision and refine the finish with appropriate tools.	History- World War Two *Cooking and Nutrition* **Using only rations from a ration book, design, make and evaluate a meal to present.** Select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically. Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed. Measure ingredients to the nearest gram and millilitre and calculate ratios of ingredients to scale up or down from a recipe. Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk.
	<u>Design:</u> • Undertake research to inform design process. This may include surveys and interviews. • Create design briefs. • Complete step-by-step plans for their designs. • Use prototypes, cross-sectional diagrams, computer-aided design and exploded diagrams to represent designs. • Complete research into key events and individuals.		<u>Evaluate:</u> • Consider the views of others when evaluating their own work. • Ensure products have a high-quality finish, using art skills where appropriate. • Justify their decisions about materials and methods of construction. • Make suggestions on how their design/product could be improved.