Barlow Hall - Design and Technology Overview – Scope and sequence

Barlow Hall's rationale behind the DT curriculum design:

Through our Design and Technology curriculum we will provide children with the knowledge and skills needed for a rapidly changing world. We want to equip our children with the skills to be able to use their creativity and imagination to solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. We aim to provide our pupils with opportunities that inspire them to think and work independently, collaboratively and innovatively whilst developing their technical understanding and skills.

Through our Design Technology curriculum, children are given opportunities to carry out research, evaluate the effectiveness of products, develop and present their ideas, make new products and to evaluate and improve their own work. Our curriculum is designed to enable children to become resilient, resourceful, innovative and enterprising citizens. They will be encouraged to think about important issues such as sustainability in order to understand both the positive and negative global impact design has on the world.

How we teach DT
We use Kapow Primary's Design Technology scheme of work and this is aligned with the national curriculum. The scheme of work is organised into key areas and these are revisited across each key stage. Links are also planned across the curriculum.
Key areas:
⋆ Cooking and nutrition
⋆ Textiles
⋆ Structures
⋆ Mechanical systems/ mechanisms
⋆ Electrical systems

Design Process
The Design and technology National Curriculum outlines the three main stages of the design process: design, make and evaluate. Each Kapow Primary unit follows these stages, to form a full project. Each stage of the design process is underpinned by technical knowledge which encompasses the contextual, historical and technical understanding, required for each strand.

A spiral curriculum
The scheme of work has been designed as a spiral curriculum with the following key principles in mind:
✓ Cyclical: Pupils return to the key areas again and again during their time in primary school.
✓ Increasing depth: Each time a key area is revisited it is covered with greater complexity.
✓ Prior knowledge: Upon returning to each key area, prior knowledge is utilised so pupils can build upon previous foundations, rather than starting again.

In the Early Years
Child-led learning is integral to the Early Years curriculum, and rightly so. Supporting children in following and exploring their own interests allows for a greater depth of learning and understanding and much higher levels of wellbeing and engagement. Adults in the classroom can model how to use Design and technology to aid children in their pursuits and scaffold the learning so that they can reach a deeper level of understanding.

	Autumn		Spring		Summer	
Nursery	Junk modelling To explore and investigate the tools in the junk modelling area.		To develop scissor skills.		To investigate cutting different materials.	
Reception	Structures - Junk Modelling Design	Hibernation Boxes	Structures - Junk Modelling – Boats Design	Food- making soup	Textiles- Book marks	Cooking and Nutrition – Designing & Making a rainbow salad of healthy food choices.
Year 1	**<u>Structure – Constructing a Windmill</u>** To learn the importance of clear design criteria To make stable structures from card, tape and glue. To learn how to turn 2D nets into 3D structures To follow instructions to cut and assemble the supporting structure of a windmill To make functioning turbines and axles which are assembled into a main supporting structure.		**<u>Textiles - Puppets</u>** Join fabrics together using pins, staples or glue. Design a puppet and use a template. – Join their two puppets' faces together as one. Decorate a puppet to match their design		**<u>Cooking and Nutrition - Smoothies</u>** To design a smoothie carton packaging by-hand. To chop fruit and vegetables safely to make a smoothie. To describe appearance, smell and taste. To know that a blender is a machine which mixes ingredients together into a smooth liquid.	
Year 2	**<u>Structures -Baby Bear's Chair</u>** Identify man-made and natural structures. Identify stable and unstable structural shapes. Contribute to discussions. Identify features that make a chair stable. Work independently to make a stable structure, following a demonstration. Explain how their ideas would be suitable for Baby Bear. Produce a model that supports a teddy, using the appropriate materials and construction techniques. Explain how they made their model strong, stiff and stable		**<u>Mechanisms/Mechanical systems – Fairground Wheel</u>** Design and label a wheel. Consider the designs of others and make comments about their practicality or appeal. Consider the materials, shape, construction and mechanisms of their wheel. Label their designs. Build a stable structure with a rotating wheel. Test and adapt their designs as necessary. Follow a design plan to make a completed model of the wheel.		**<u>Mechanisms/Mechanical Systems Nutrition – Making a Moving Monster</u>** Designing a moving monster for a specific audience in accordance with a design criteria. **Design** • Creating a class design criteria for a moving monster. • Designing a moving monster for a specific audience in accordance with a design criteria. **Make** • To chop foods safely to make a wrap. • To construct a wrap that meets a design brief. • To grate foods to make a wrap.	

			• To snip smaller foods instead of cutting. **Evaluate** • To describe the taste, texture and smell of fruit and vegetables. • To taste test food combinations and final products. • To describe the information that should be included on a label. •To evaluate food by giving a score.
Year 3	**Cooking and Nutrition – Eating Seasonally** Different countries based on their climates. Understand that seasonal fruits and vegetables grow in a given season. Understand that eating seasonal fruit and vegetables positively affects the environment. Design a tart recipe using seasonal ingredients	**Structures – Constructing a Castle** Designing a castle with key features to appeal to a specific person/purpose. Designing and/or decorating a castle tower on CAD software. Making facades from a range of recycled materials. Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design. Suggesting points for modification of the individual designs.	**Digital World – Wearable Technology** To draw and manipulate 2D shapes, using computer-aided design to produce a point of sale badge. To develop design ideas through annotated sketches to create a product concept. To write a program to control (button press) and/or monitor (sense light) that will initiate flashing LED algorithm. To analyse and evaluate wearable technology To use feedback from peers to improve design.
Year 4	**Structures -Pavilions** Produce a range of freestanding frame structures of different shapes and sizes. Design a pavilion that is strong, stable and aesthetically pleasing. Select appropriate materials and construction techniques to create a stable, free-standing frame structure Select appropriate materials and techniques to add cladding to their pavilion.	**Electrical Systems - Torches** Identify electrical products and explain why they are useful. Help to make a working switch. Identify the features of a torch and how it works. Describe what makes a torch successful. Create suitable designs that fit the success criteria and their own design criteria. Create a functioning torch with a switch according to their design criteria	**Mechanical systems – Making a sling shot car** Work independently to produce an accurate, functioning car chassis. Design a shape that is suitable for the project. Attempt to reduce air resistance through the design of the shape. Produce panels that will fit the chassis and can be assembled effectively using the tabs they have designed. Construct car bodies effectively. Conduct a trial accurately and draw conclusions and improvements from the results
Year 5	**Electrical systems - Doodlers** Developing design criteria that clarifies	**Mechanical System – Pop-up book** Produce a suitable plan for each page of their book.	**Cooking and Nutrition – Developing a recipe** To adapt a traditional recipe, understanding that

	the target user. Making a functional series circuit, incorporating a motor. Carry out a product analysis to look at the purpose of a product along with its strengths and weaknesses. Determining which parts of a product affect its function and which parts affect its form.	Produce the structure of the book. Assemble the components necessary for all their structures/mechanisms. Hide the mechanical elements with more layers using spacers where needed. Use a range of mechanisms and structures to illustrate their story and make it interactive for the users. Use appropriate materials and captions to illustrate the story.	the nutritional value of a recipe alters if you remove, substitute or add additional ingredients. To design appealing packaging to reflect a recipe. To use equipment safely, including knives, hot pans and hobs. To follow a step by step method carefully to make a recipe. To identify and describe healthy benefits of food groups. To know that nutritional information is found on food packaging.
Year 6	**<u>Textiles - Waistcoats</u>** **Design** Annotating designs, to explain their decisions. Using a template when cutting fabric to ensure they achieve the correct shape. Using pins effectively to secure a template to fabric without creases or bulges. Marking and cutting fabric accurately, in accordance with their design. Sewing a strong running stitch, making small, neat stitches and following the edge. Sewing accurately with evenly spaced, neat stitches.	**<u>Structure – Playgrounds</u>** Create five apparatus designs, applying the design criteria to their work. Make suitable changes to their work after peer evaluation. Make roughly three different structures from their plans using the materials available. Complete their structures, improving the quality of their rough versions and applying some cladding to a few areas. Secure their apparatus to a base. Make a range of landscape features using a variety of materials, which will enhance their apparatus. .	**<u>Digital World – Navigating the World</u>** **Design** Considering and suggesting additional functions for my navigation tool Developing a product idea through annotated sketches Placing and manoeuvring 3D objects, using CAD Changing the properties of, or combine one or more 3D objects, using CAD Considering materials and their functional properties, especially those that are sustainable and recyclable (for example, cork and bamboo) Explaining how my program fits the design criteria and how it would be useful as part of a navigation tool