



## Clipston Endowed VC Primary School – The Big Picture – Design Technology

<b>Our Over-arching Intent</b>	That every child flourishes and enjoys learning through access to a rich, rounded, connected, coherent and progressive curriculum		
<b>Aims of our Curriculum – by the end of their time with us at Clipston we aim...</b>	To develop successful, engaged learners who enjoy learning and who are knowledgeable and skilled, make progress and achieve	To develop confident, articulate individuals, who can lead safe, healthy and fulfilling lives in the communities in which they live now and in the future.	To develop responsible, happy citizens of the world who have the capacity to make positive contributions to society.
<b>Core School Value</b>	<b>“Be Kind ~ Be Your Best ~ Be Happy”</b>		
<b>The Intrinsic Core of DT – our Intent – what we seek to achieve for our children as designers of technology.</b>	<b>To develop the creative and practical expertise needed to design high-quality prototypes and products for a wide range of users.</b>	<b>To develop the technical and practical expertise needed to make high-quality prototypes and products for a wide range of users.</b>	<b>To critique, evaluate and test their ideas and products and the work of others.</b>
<b>We will develop the knowledge and skills that children need to succeed</b>	<b>Develop children’s vocabulary acquisition and oracy skills so that they can articulate their thoughts both verbally and in written form, in order to communicate effectively in a range of situations.</b>		<b>Provide opportunities for children to be exposed to a wide variety of cultures, topics, themes and points of view to counter-balance the lack of diversity in our local demographic at our largely white British school, in order to prepare them for life in modern Britain.</b>

### How we organise learning in DT, through the development of Big Ideas

<b>Explore and Investigate Whole School Big Ideas</b>	<b>Structures</b>	<b>Mechanisms</b>	<b>Electrical Systems (KS2 only)</b>
	Materials have both functional and aesthetic properties and these are important to consider when designing and making a product: <ul style="list-style-type: none"> <li>Build structures, exploring how they can be made stronger, stiffer and more stable.</li> <li>Recognise areas of weakness through trial and error.</li> <li>Understand material selection and learn methods to reinforce structures.</li> </ul>	Natural movements can be mimicked using mechanisms with our designs: <ul style="list-style-type: none"> <li>Introduce and explore simple mechanisms, such as sliders, wheels and axles in their designs.</li> <li>Recognise where mechanisms such as these exist in toys and other familiar products.</li> <li>Extend pupils understanding of individual mechanisms, to form part of a functional system, for example: Automata that use a combination of cams, followers, axles/shaft, cranks and toppers.</li> </ul>	Operational series circuits, circuit components, circuit diagrams and symbols can be combined to create various electrical products: <ul style="list-style-type: none"> <li>Create functional electrical products that use series circuits, incorporating different components such as bulbs, LEDs, switches, buzzers and motors.</li> <li>Consider how the materials used in these products can: protect the circuitry; reflect light; conduct electricity; and insulate.</li> </ul>
	<b>Textiles</b>	<b>Cooking and Nutrition</b>	<b>Digital World (KS2 only)</b>
	Fabric techniques can be functional or decorative and these are important to consider when designing and making a product: <ul style="list-style-type: none"> <li>Explore different methods of joining fabrics including running stitch, cross stitch, blanket stitch and appliqué.</li> <li>Experiment to determine the pros and cons of each technique.</li> <li>Understand that fabric can be layered for effect, recognising the appearance and technique for different stitch and fastening types, including their: strength, appropriate use, and design.</li> </ul>	Understand and apply the principles of nutrition and learn how to cook. <ul style="list-style-type: none"> <li>Learn about the basic rules of a healthy and varied diet to create dishes.</li> <li>Understand where food comes from, for example plants and animals.</li> <li>Understand and apply the principles of a healthy and varied diet to prepare and cook a variety of dishes using a range of cooking techniques and methods.</li> <li>Understand what is meant by seasonal foods.</li> <li>Know where and how ingredients are sourced.</li> </ul>	Monitor and control functions can be programmed into products using 2D and 3D CAD (computer-aided design) software. <ul style="list-style-type: none"> <li>Learn how to develop an electronic product with processing capabilities.</li> <li>Apply Computing principles to program functions within a product including to control and monitor it.</li> <li>Understand how the history and evolution of product design lead to the on-going Digital revolution and the impact it is having in the world today.</li> </ul>

The Big Ideas are developed through the understanding of Key Themes or Schema, developed from EYFS to Year 6

<b>Explore and Investigate Key Themes (Schema)</b>	<b>Design</b>	<b>Make</b>	<b>Evaluate</b>	<b>Technical Knowledge</b>
	Research products and user requirements. Use design criteria (e.g. tailoring to an audience/user). Generate ideas (e.g. annotated sketches, cross-section diagrams). Develop ideas (e.g. templates, pattern pieces). Use models and prototypes (both virtual and physical) to inform design. Create innovative, fit-for-purpose and functional product solutions to design problems.	Select and use appropriate tools and equipment. Understand and select materials and components (including ingredients) based on their aesthetic and functional properties. Carry out practical tasks with increasing accuracy and precision. Understand the importance of, and follow the health and safety rules.	Explore existing products. Evaluate against a list of design criteria. Evaluate, investigate and analyse existing products. Evaluate their own and others’ ideas. Understand how key events and individuals have helped to shape the world of D&T. Consider feedback to make improvements.	Each stage of the design process (design, make, evaluate) is underpinned by technical knowledge which encompasses the contextual, historical and technical understanding, required for each strand.

### Implementation: How do we deliver our Curriculum? (Year A – 2021/22 Year B – 2022/23)

<b>Early Years</b>	Children’s development will be supported as they make sense of their physical world and their community through a variety of activities and experiences that reflect upon the Characteristics of Effective Teaching and Learning, including opportunities to explore, observe and find out about people, places, technology and the environment. A full outline of the EYFS specifically linked to DT can be found in our DT Overview and End Points document.		
<b>Progression</b>	<b>Progression in Learning from Reception to Year 6 is outlined in our D&amp;T Overview and End Points document</b>		
<b>Key Stage 1 – Year 1 &amp; Year 2</b>			
<b>Big Ideas – Planned Progression of Components for Key Stage One</b>	<b>Design</b>	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.	
	<b>Make</b>	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.	
	<b>Evaluate</b>	Explore and evaluate a range of existing products. Evaluate their ideas and products against design criteria.	

	<b>Technical Knowledge</b>	Build structures, exploring how they can be made stronger, stiffer and more stable. Explore and use mechanisms (for example, levers, sliders, wheels and axles) in their products.	
Key Stage One Disciplinary Knowledge – In the context of...	<b>Year A</b>		
	<b>Structures: Constructing a Windmill</b> <ul style="list-style-type: none"> <li>- Design, decorate and build a windmill for their mouse client to live in.</li> <li>- Develop understanding of different types of windmill, how they work and their key features.</li> </ul> <b>Mechanisms: Making a Moving Monster</b> <ul style="list-style-type: none"> <li>- Learn the terms; pivot, lever and linkage.</li> <li>- Design a monster that will move using a linkage mechanism.</li> <li>- Practise making linkages of different types and varying the materials used, to bring monsters to life with the gift of movement.</li> </ul> <b>Textiles: Pouches</b> <ul style="list-style-type: none"> <li>- Introduce running stitch and use to join fabrics.</li> <li>- Decorate a pouch using fabric glue or stitching.</li> </ul>	<b>Year B</b> <b>Mechanisms: Wheels and Axles</b> <ul style="list-style-type: none"> <li>- Understand how wheels move and what stops them from turning.</li> <li>- Design and build a moving vehicle.</li> </ul> <b>Food and Nutrition: A Balanced Diet</b> <ul style="list-style-type: none"> <li>- Explore what makes a balanced diet and learn about the term 'hidden sugars'.</li> <li>- Taste test food combinations of different food groups.</li> <li>- Make a wrap that includes a healthy mix of protein, vegetables and dairy.</li> </ul> <b>Mechanisms: Fairground Wheel</b> <ul style="list-style-type: none"> <li>- Design and create their own Ferris wheels, considering how the different components fit together so that their wheels rotate and their structures stand freely.</li> <li>- Select appropriate materials and develop their cutting and joining skills to create a final product.</li> </ul>	
<b>Lower Key Stage 2 – Year 3 &amp; Year 4</b>			
Big Ideas – Planned Progression of Components for Lower Key Stage Two	<b>Design</b>	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.	
	<b>Make</b>	Select from and use a growing range of tools and equipment to perform practical tasks, for example, cutting, shaping, joining and finishing, with increasing accuracy. Select from and use a growing range of materials and components, including construction materials, textiles and ingredients, beginning to consider their functional properties and aesthetic qualities.	
	<b>Evaluate</b>	Investigate and analyse a range of existing products. Evaluate their ideas and products against their own design criteria. Understand how key events and individuals in design and technology have helped shape the world.	
	<b>Technical Knowledge</b>	Apply their understanding of how to strengthen, stiffen and reinforce more complex structures. Begin to understand and use mechanical systems in their products, for example, gears, pulleys, cams, levers and linkages. Begin to understand and use electrical systems in their products, for example, series circuits and bulbs. Begin to apply their understanding of computing to program, monitor and control their products.	
Lower Key Stage Two Disciplinary Knowledge – In the context of...	<b>Year A</b>		
	<b>Electrical Systems: Electric Posters</b> <ul style="list-style-type: none"> <li>- Introduce various forms of 'Information design'.</li> <li>- Develop a museum display poster incorporating a simple circuit component.</li> </ul> <b>Mechanisms: Pneumatic Toys</b> <ul style="list-style-type: none"> <li>- Design and create a toy with a pneumatic system, learning how trapped air can be used to create a product with moving parts.</li> <li>- Introduce thumbnail sketches and exploded diagrams.</li> </ul> <b>Food and Nutrition: Eating Seasonally</b> <ul style="list-style-type: none"> <li>- Understand the advantages of eating seasonal food grown in the UK.</li> <li>- Create a recipe that is healthy and nutritious using seasonal vegetables.</li> <li>- Safely follow a recipe when cooking.</li> </ul>	<b>Year B</b> <b>Structures: Constructing a Castle</b> <ul style="list-style-type: none"> <li>- Combine multiple shapes (2D and 3D) to form a strong and stable structure.</li> <li>- Construct 3D shapes from nets.</li> <li>- Design and construct a castle then evaluate the final product.</li> </ul> <b>Textiles: Cushions</b> <ul style="list-style-type: none"> <li>- Introduce cross stitch and appliqué.</li> <li>- Apply this knowledge to the design, decoration and assembly of their own cushions.</li> </ul> <b>Digital World: Electronic Charm</b> <ul style="list-style-type: none"> <li>- Design, code, make and promote a Micro:bit electronic charm to use in low-light conditions, developing their understanding of programming to monitor and control their products.</li> </ul>	
<b>Upper Key Stage 2 – Year 5 &amp; Year 6</b>			
Big Ideas – Planned Progression of Components for Upper Key Stage Two	<b>Design</b>	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.	
	<b>Make</b>	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 and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.	
	<b>Evaluate</b>	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.	
	<b>Technical Knowledge</b>	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 program, monitor and control their products.	
Upper Key Stage Two Disciplinary Knowledge – In the context of...	<b>Year A</b>		
	<b>Mechanisms: Automata Toys</b> <ul style="list-style-type: none"> <li>- Use woodworking materials and skills to construct a window display using an automata mechanism.</li> <li>- Measure and cut materials, assemble the frame, choose cams, design the characters that sit on the followers, and finish with a foreground and background.</li> </ul> <b>Textiles: Stuffed Toys</b> <ul style="list-style-type: none"> <li>- Create own stuffed toy to bring drawings to life.</li> <li>- Apply skills they have learned in previous textile topics and introduce blanket stitch.</li> </ul> <b>Food and Nutrition: African Adventure</b> <ul style="list-style-type: none"> <li>- Focusing on nutrition and what constitutes a healthy, balanced diet, research and modify a traditional African recipe to make it healthier.</li> <li>- Cook their new and improved versions (ensuring appropriate food hygiene and health and safety standards), conduct taste-tests and score their food.</li> </ul>	<b>Year B</b> <b>Structures: Bridges</b> <ul style="list-style-type: none"> <li>- Develop understanding of secure structures and introduce to skills for measuring, sawing and joining wood accurately.</li> <li>- Learn about different types of bridges and explore how the strength of structures can be affected by the shapes used.</li> <li>- Create own wooden bridge and test its durability.</li> </ul> <b>Electrical Systems: Steady-hand Game</b> <ul style="list-style-type: none"> <li>- Use understanding of electrical systems and design, to design and create a steady hand game.</li> <li>- Use nets to create bases and their knowledge of electrical circuits to build a circuit with a buzzer which closes when the handle makes contact with the wire frame.</li> </ul> <b>Digital World: Monitoring Devices</b> <ul style="list-style-type: none"> <li>- Apply computing knowledge and understanding to program a Micro: bit animal monitoring device that will support animal care and alert their owners when the temperature is not optimal using sound and an LED.</li> <li>- Develop 3D CAD skills by learning how to navigate the Tinkercad interface and essential tools to combine multiple objects.</li> </ul>	
Impact	<b>Most children achieve the End Point Milestones for Design and Technology</b>		
	<b>Children become...</b>	successful, engaged learners who enjoy learning and who are knowledgeable and skilled, make progress and achieve.	confident, articulate individuals, who can lead safe, healthy and fulfilling lives in the communities in which they live now and in the future.