Design and Technology at Falconhurst School

Intent for our Designers

At Falconhurst, we are the designers of the future! We want to inspire a love of design technology into our children. We are committed to providing an exciting, engaging and ambitious curriculum, providing a wide range of activities and opportunities to all of our children. In our school, the pupils use their creativity and imagination to design and make products to solve real and relevant problems in a range of contexts. The children acquire a broad range of subject knowledge and draw on the disciplines such as mathematics, science, engineering, computing and art to further stregnthen their understanding. Pupils learn, and are encouraged to take risks, so as to become resourceful, innovative, enterprising and capable designers.

Characteristics of a Designer

- Significant levels of originality and the willingness to take creative risks to produce innovative ideas and prototypes
- An excellent attitude to learning and independent working
- The ability to use time efficiently and work constructively and productively with others
- The ability to carry out thorough research, show initiative and ask questions to develop an exceptionally detailed knowledge of users' needs
- The ability to act as responsible designers and makers, working ethically, using finite materials carefully and working safely
- A thorough knowledge of which tools, equipment and materials to use to make their products
- The ability to apply mathematical knowledge
- The ability to manage risks exceptionally well to manufacture products safely and hygienically
- A passion for the subject and knowledge of up-to-date technological innovations in materials, products and systems.

Implementation of Design and Technology

Our pupils are expected to organise their knowledge, skills and understanding around the following learning hooks (key concepts).

1. Mastering Practical Skills
2. Design, Make, Evaluate and Improve
3. Take inspiration from design throughout history

These key concepts (learning hooks for children), underpin the learning in each milestone. This enables pupils to reinforce and build upon prior learning, make connections to new learning and develop subject specific language.

The vertical accumulation of knowledge and skills typically expected from Years 1 to 6 is mapped below

Essential EYFS curriculum	Essential National Curriculum Opportunities Key Stage 2
Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment.	

• Use a range of small tools, including scissors, paintbrushes and cutlery • 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.	**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, such as 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** · 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, such as gears, pulleys, cams, levers and linkages. · understand and use electrical systems in their products, such as 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.
Essential National Curriculum Opportunities Key Stage 1	
Design • 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. **Make** • select from and use a range of tools and equipment to perform practical tasks such as 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** • explore and evaluate a range of existing products. • evaluate their ideas and products against design criteria. **Technical knowledge** • build structures, exploring how they can be made stronger, stiffer and more stable. • explore and use mechanisms, such as levers, sliders, wheels and axles, in their products. **Cooking and nutrition** • use the basic principles of a healthy and varied diet to prepare dishes. • Understand where food comes from.	

Essential Learning Objectives		EYFS	Milestone 1 End of Year 2	Milestone 2 End of Year 4	Milestone 3 End of Year 6
To master practical skills	Food	Safely use a range of equipment to prepare food. Cut and slice ingredients Share creations	Use the basic principles of a healthy and varied diet to prepare dishes. Understand where food comes from. Cut, peel or grate ingredients safely and hygienically Measure or weigh using measuring cups or electronic scales Assemble or cook ingredients	Understand and apply the principles of a healthy and varied diet. Prepare ingredients hygienically using appropriate utensils. Measure ingredients to the nearest gram accurately. Follow a recipe. Assemble or cook ingredients (controlling the temperature of the oven or hob, if cooking).	Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed. Demonstrate a range of baking and cooking techniques, preparing and cooking a variety of predominantly savoury dishes. Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms). Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. Create and refine recipes, including ingredients, methods, cooking times and temperatures.
	Materials	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.	Cut materials safely using tools provided. Measure and mark out to the nearest cm Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling) Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen)	Cut materials accurately and safely by selecting appropriate tools. Measure and mark out to the nearest mm 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.	Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or a more precise scissor cut after roughly cutting out a shape). Show an understanding of the qualities of materials to choose appropriate tools to cut and shape (such as the nature of fabric may require sharper scissors than would be used to cut paper
	Textiles	. Select tools and techniques needed to shape, assemble and join materials Manipulate materials to achieve a planned effeft	Shape textiles using templates. Join textiles using running stitch. Colour and decorate textiles using a number of techniques (such as dyeing, adding sequins or printing).	Understand the need for a seam allowance. Join textiles with appropriate stitching. Select the most appropriate techniques to decorate textiles.	Join textiles using a combination of stitching techniques, taking into account their functional and aesthetic qualities. Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles. Create objects (e.g. a cushion) that employ a seam allowance.

	Electricals and Electronics		Diagnose faults in battery operated devices (such as low battery, water damage or battery terminal damage).	Use electrical systems in products, such as series and/or parallel circuits.	Understand and use electrical systems in products, incorporating a range of components such as buzzers and motors.
	Computing		Model designs using software.	Control and monitor models using software designed for this purpose.	Write code to control and monitor models or products.
	Construction	Constuct with purpose in mind, using a variety of resources. Select tools and techniques needed to shape, assemble and join materials	Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen products, make them stiffer or more stable.	Choose suitable techniques to construct products or to repair items. Strengthen materials using suitable techniques.	Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filling and sanding). Apply understanding of how to strengthen, stiffen and reinforce more complex structures.
	Mechanics		Create products using levers, sliders, wheels and axles, and winding mechanisms.	Use scientific knowledge (e.g. of forces) to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears).	Understand and use mechanical systems in their products, such as gears, pulleys, cams, levers and linkages. Convert rotary motion to linear using cams Use innovative combinations of electronics (or computing) and mechanics in product designs.
	To design and make, taking inspiration from design throughout history.		Design products with a clear purpose and an intended user. Use software to design. Develop their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology. Make products, refining the design as work progresses. Select from and use a range of tools and equipment to perform practical tasks such as 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.	Design functional, appealing products based on design criteria that are fit for purpose and designed with the user in mind. Identify some of the great designers to generate ideas for designs. Develop ideas through the use of discussion, annotated sketches and computer-aided design. Improve upon existing designs, giving reasons for choices. Make products by working efficiently and carefully selecting materials.	Investigate and analyse a range of existing products. Evaluate ideas and products against own design criteria and consider the views of others to improve work. Understand how key events and individuals in design and technology have helped shape the world. Make products through stages of prototypes, making continual refinements. Ensure products have a high quality finish, using art skills where appropriate.

	To Evaluate	Explore objects and designs to identify likes and dislikes. Suggest improvements to existing designs. Explore and evaluate a range of existing products (including identifying how they have been created). Evaluate their ideas and products against design criteria.	Refine product and techniques as work progresses, continually evaluating the product design.	Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose and designed with the user in mind, improving upon existing products where appropriate. Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices. Develop ideas through the use of, e.g., discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design, deciding on the most appropriate way to represent designs.