Design and Technology Skills Progression

Design and Technology Curriculum Aims & Rationale

Intent

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

At Sacred Heart RC School the intention is to prepare children for an ever changing world by giving them a range of transferable skills. Our design and technology curriculum is integral to this, encouraging children to become creative problem-solvers and to work independently and as part of an effective team. Through the study of design and technology, children combine practical skills with an understanding of aesthetic, historical, social and environmental problems, in order to design and make a product. Learning from past designs, innovating and evaluating are all key components of the design process and allow children to adapt and improve their product - key skills which they need throughout their life. Design and Technology helps all children to become discriminating and informed consumers and potential innovators. Our curriculum aims to equip pupils with practical skills in woodwork, electronics, mechanics and textiles so that children can develop independence in their every day life, supporting their development as independent and self-sufficient individuals.

Teaching children about nutrition, healthy life styles and cooking is of great importance and particular relevance in a climate of growing obesity. For this reason, pupils will study a food and nutrition unit every year. By instilling a love of cooking in pupils, we will further foster independence, creativity and an understanding of the importance of a healthy lifestyle. Learning how to cook is a crucial life skill that enables pupils to feed themselves and others affordably and well, now and in later life.

Implementation

At Sacred Heart Primary School our design and technology curriculum is built around essential knowledge, and key skills and is taught as a discrete subject within a thematic curriculum. Skills are broken down into yearly outcomes and show clear continuity and progress. All teaching of design and technology follows the design, make and evaluate cycle and design and technology projects all have a design purpose with a relevant context. In KS1 pupils are taught how to design, make and evaluate, but also to gain specific technical knowledge and skills such as using mechanisms (levers, slides, wheels) and sewing techniques. In KS2 pupils will also design, make and evaluate products, but their technical knowledge and skills will develop and build on existing skills to strengthen and reinforce more complex structures, use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages), understand and use electrical systems in their products and apply their understanding of computing to design, program and control their products.

Cooking and nutrition in KS1 focuses on the basic principles of a healthy, varied diet. Children learn to prepare and cook predominately savoury dishes, learning safe cutting techniques and the importance of food hygiene. In KS2 pupils further build upon the skills they learnt in KS1, designing, making and evaluating more complex dishes and learning about seasonality. Children are given plenty of opportunity to apply the cooking skills they've learned in design and

technology in other subjects, for example creating fruit skewers in P.E. and a Christmas Dinner for the homeless shelter as part of our social action work.

Impact
Children will develop a range of transferable skills through their Design and Technology lessons and as a result will become more creative, responsible and confident individuals. Through carefully planned and implemented learning activities the pupils develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world. They gain a firm foundation of knowledge and skills to see them equipped to take on further learning when they leave Key Stage 2.

Design and Technology Skills Progression

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Design, make, evaluate and improve	- Explore objects to identify how they have been created. - Design a product for a purpose.	- Explore objects to identify how they have been created. - Design a product for a purpose. - Refine designs as work progresses	- Design with purpose • Refine work and techniques as work progresses, continually evaluating the product design. • Use software to design and represent product designs.	- Design with purpose by identifying opportunities to design. - Make products by working efficiently (such as by carefully selecting materials). - Refine work and techniques as work progresses, continually evaluating the product design. - Use software to design and represent product designs.	- Combine elements of design from a range of designs giving reasons for choices - Ensure products have a high quality finish, using art skills where appropriate. - Use prototypes, cross-sectional diagrams and computer aided designs to represent designs.	- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose. - Create innovative designs that improve upon existing products •Evaluate the design of products so as to suggest improvements to the user experience

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Food	▪ To cut and grate ingredients safely and hygienically ▪ Assemble or cook ingredients.	▪ Cut, peel or grate ingredients safely and hygienically. ▪ Measure or weigh using measuring cups or electronic scales. ▪ Assemble or cook ingredients.	▪ 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)	▪ 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)	▪ Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. ▪ Demonstrate a range of baking and cooking techniques. ▪ Create and refine recipes, including ingredients, methods, cooking times and temperatures	▪ Measure accurately and calculate ratios of ingredients to scale up or down from a recipe. ▪ Demonstrate a range of baking and cooking techniques. ▪ Create and refine recipes, including ingredients, methods, cooking times and temperatures

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Textiles		• 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 with a combination of stitching techniques (such as back stitch for seams and running stitch to attach decoration). ▪ Use the qualities of materials to create suitable visual and tactile effects in the decoration of textiles	
Materials, Construction and	• Uses various construction materials. • Create a product with movable levers • Use Materials to	▪ Create products using levers, wheels and winding mechanisms. ▪ Use materials to practise drilling, screwing, gluing and nailing materials to make and strengthen	• To make a product using mechanical components • Measure and mark out using units of measure	▪ Cut materials accurately ▪ Measure and mark out using units of measure ▪ Use appropriate cutting techniques ▪ Use appropriate joining	▪ 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	▪ Know how to reinforce and strengthen a 3D framework. ▪ Cut materials with precision and refine the finish with appropriate tools (such as sanding

Mechanics	practise gluing and nailing materials to make and strengthen • Cut materials safely using tools provided. • 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).	products. ▪ Cut materials safely using tools provided. ▪ Measure and mark out to the nearest centimetre. ▪ Demonstrate a range of joining techniques (such as gluing, hinges or combining materials to strengthen).	• Use scientific knowledge of forces to choose appropriate mechanisms for a product (such as levers, winding mechanisms, pulleys and gears)	technique ▪ Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as winding mechanisms). ▪ Choose suitable techniques to construct products or to repair items. ▪ Make products by working efficiently	shape). ▪ Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filling and sanding). ▪ Convert rotary motion to linear using cams. ▪ Use innovative combinations of electronics (or computing) and mechanics in product designs.	wood after cutting or 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). ▪ practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding ▪ Test and evaluate product
Electricals and Electronics				▪ create series and parallel circuits		• Create circuits using electronics kits that employ a number of components

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing	▪	▪	▪ Control and create models using software designed for this purpose	▪ Control and monitor models using software designed for this purpose.	▪ Make products through stages of prototypes, making continual refinements through digital technology ▪ Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. ▪ Write code to control and monitor models or products.	▪ Write code to control and monitor models or products.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Communicate technologically	- Design a product with a clear purpose - Refine designs as work progresses. - Evaluate their products against design criteria - Suggest improvements and evaluate designs	- Design a product with a clear purpose - Refine designs as work progresses. - Evaluate their products against design criteria	- Design with purpose by identifying opportunities to design - Make products by working efficiently - Refine work and techniques as work progresses, continually evaluating the product design. - Improve upon existing designs giving reasons for choices	- Design with purpose by identifying opportunities to design. - Make products by working efficiently - Refine work and techniques as work progresses, continually evaluating the product design.	- Make products through stages of prototypes, making continual refinements through digital technology - Use prototypes, cross-sectional diagrams and computer aided designs to represent designs. - Write code to control and monitor models or products.	- Plan the order of their work, choosing appropriate techniques - Identify the strengths and areas for development in their ideas and products - Evaluate their products, identifying strengths and areas for development, and carrying out appropriate tests. - Design with the user in mind motivated by the service a product will offer - Ensure products have a high-quality finish, using art skills where appropriate - Use prototypes, cross sectional diagrams and computer aided design to represent designs