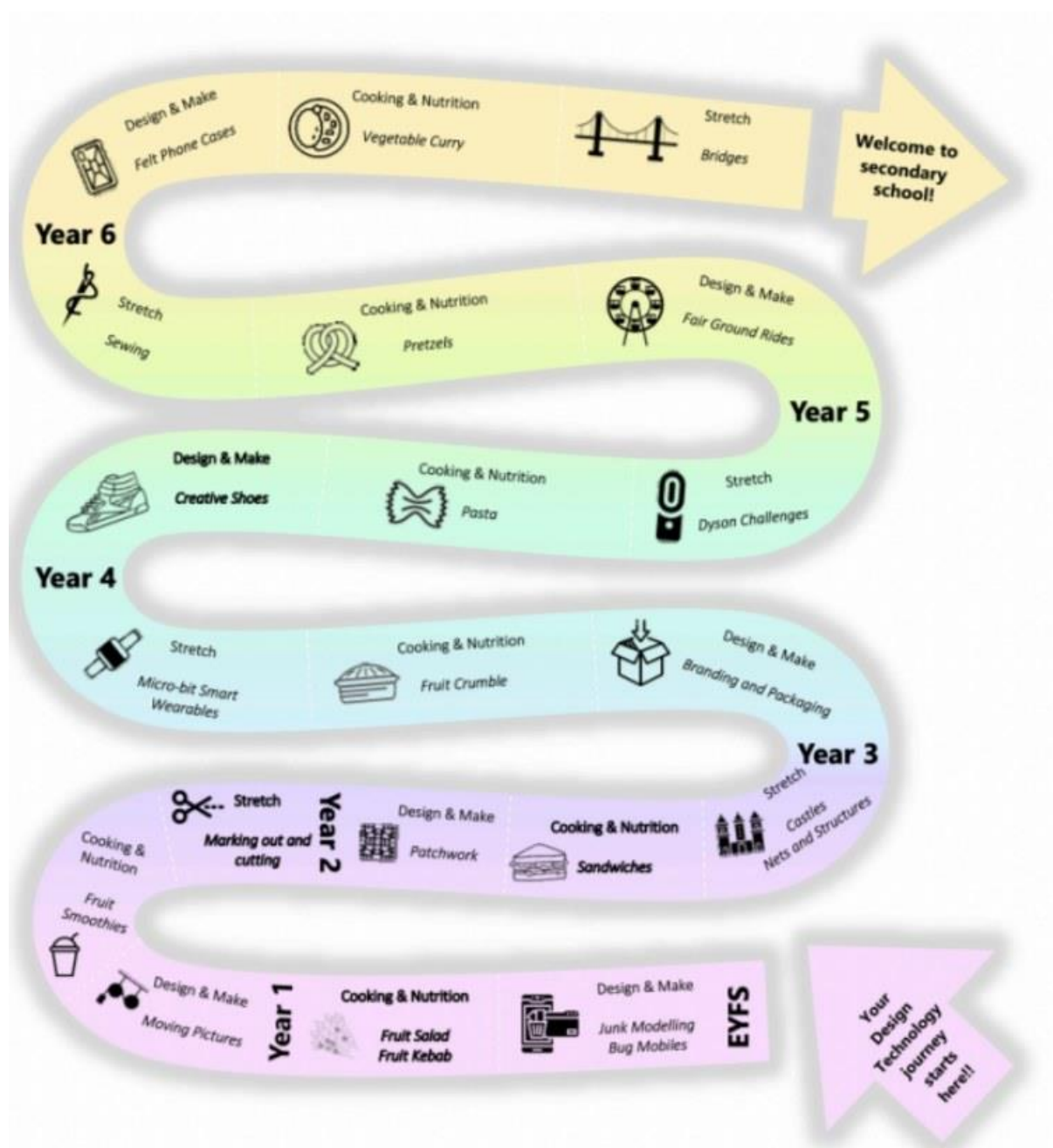




Design Technology

Our Curriculum Narrative



Purpose of Study - National Curriculum

Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and

the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims of the Curriculum

- 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.

Threshold Concepts



1. Design



- Using research and exploration to identify and understand user needs.
- Identifying and solving design problems.
- Developing specifications to inform the design of innovative, functional and appealing products in a variety of situations.

- Using a variety of approaches to generate creative ideas.
- Developing and communicating design ideas in a variety of formats.

2. Make



Selecting and using specialist tools, techniques, processes, equipment and machinery.

- Selecting and using a wide and complex range of materials, components and ingredients – considering their properties.
- Preparing and cooking a variety of dishes using a range of cooking techniques

3. Evaluate



- Analysing the work of past and present professionals.
- Investigating new and emerging technologies.
- Using a design specification and user feedback to test, evaluate and refine ideas.
- Exploring the impact of design and technology on society and the environment.

4. Technical Knowledge



- Understanding and using materials based on their properties and structural performance.
- Understanding how mechanical systems are used in products to change movement and force.
- Understanding how electrical and electronic systems are used and can be powered within products.
- Applying computing and programmable computers to embed intelligence into products.
- Understanding the principles of a healthy and varied diet.
- Understanding seasonality and food sources.

In order to equip children with a breadth and depth of knowledge, the curriculum embeds these threshold concepts through the completion of three projects/units in each year group:

- Cooking and Nutrition ▪ Design and Make ▪ Stretch.

Design Technology Curriculum



Our Design Technology curriculum aims to excite and ignite our pupils' interest in design and technology and prepare them to participate in the development of a rapidly changing world. In each unit of work, they design and make products for a specific need or purpose - solving real and relevant problems within a variety of contexts. Through carefully constructed sequences of learning, they are taught about the world we live in and develop a wide range of skills embedded through the threshold concepts of designing, making, evaluating and problem solving – they are exposed to an abundance of technical knowledge in each and every lesson.

The curriculum has been carefully created by Primary Subject Leads and Secondary Heads of Department colleagues, who have worked collaboratively to create high quality toolkits to deliver the threshold concepts. An effective Design and Technology curriculum should encompass all of the threshold concepts within the delivery of each project.

EYFS



Throughout their time in EYFS through Expressive Arts and Design children will explore different materials and develop their ideas about how to use them. They will decide which

materials to use to express their ideas by joining different materials in a variety of ways and exploring different textures. Through Physical Development children will choose the right resources to carry out their own plan. They will use a range of one-handed tools and equipment, for example, making snips in paper with scissors. Children will be introduced to Cooking & Nutrition by preparing and tasting a range of fruits and foods from around the world. Design skills will be developed through junk modelling in continuous provision.

By the end of Reception children at the expected level of development will:

- 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 (ELG- Creating with Materials)

Key Stage 1



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 [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

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 [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.

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 [for example, levers, sliders, wheels and axles], in their products.

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 [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

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 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 [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.

Key Stage 3



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 domestic and local contexts [for example, the home, health, leisure and culture], and industrial contexts [for example, engineering, manufacturing, construction, food, energy, agriculture (including horticulture) and fashion].

Design

- Use research and exploration, such as the study of different cultures, to identify and understand user needs
- Identify and solve their own design problems and understand how to reformulate problems given to them
- Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations.
- Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses
- Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools

Make

- Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
- Select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties

Evaluate

- Analyse the work of past and present professionals and others to develop and broaden their understanding

- Investigate new and emerging technologies
- Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups
- Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists

Technical Knowledge

- Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions
- Understand how more advanced mechanical systems used in their products enable changes in movement and force
- Understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]
- Apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers].

Assessment



In the moment feedback



During a design and technology task the giving of advice and technical points for improvement are more beneficial for learners than written marking alone. Effective feedback helps students increase effort or increase aspiration and this is achieved by asking questions to stimulate the students to think for themselves. That is the challenge in providing 'in the moment' feedback during a designing and making task. Note also that over time such in the moment feedback is likely to improve confidence in learners and provide insights that empower them to make progress.

Verbal Feedback



Discussing designs or final pieces with children allows a teacher to model or suggest improvements needed. Ideally the teacher will discuss face to face with each student how well he or she has succeeded the task in terms of the skills they learned and showed in using the tools, material and equipment with regard to level of execution, soundness of assembly and the performance of what they made.