# Product Design

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**Curriculum Intent:**
Students will learn through a variety of projects during Key Stage Three/Four and Five, how to use the technological principles of explore, create, and evaluate to solve problems. On this learning journey, these projects will also bestow upon them the technical knowledge required to be a Product Designer

| | Core Knowledge | Procedural Knowledge |
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| **Autumn Term 1** | **Topics:**<br>Boxed In: A Study in Timber and Technique<br>• Timber Types and Properties<br>• Woodworking Joints<br>• Safe Use of Tools<br>• Pyrography and Finishing | **Students will:**<br>• Understanding the differences between hardwoods and softwoods, and selecting appropriate timber based on its characteristics and intended use.<br>• Learning how to identify, mark out, and construct basic wood joints such as butt, finger, and halving joints, and understanding their strengths and applications.<br>• Developing skills in the correct and safe use of hand tools (e.g. saws, chisels, mallets) and workshop procedures to ensure accurate and safe working practices.<br>• Gaining knowledge of pyrography techniques for decorative purposes and applying suitable finishes to enhance the appearance and durability of the final product. |
| **Autumn Term 2** | **Topics:**<br>Metal Matters: The Pewter Project<br>• Pewter Properties and Uses –<br>• Casting Techniques<br>• Design for Manufacture<br>• Finishing and Polishing Metals | **Students will:**<br>• Understanding the characteristics of pewter, including its low melting point, malleability, and typical applications in casting and decorative products.<br>• Learning the process of casting metal, including designing a mould, creating it using MDF or other materials, and safely pouring molten pewter.<br>• Developing design ideas that are suitable for mould-making, considering form, detail, and how designs translate into a cast object.<br>• Gaining practical skills in filing, sanding, and polishing pewter to achieve a high-quality, finished product. |

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| **Spring Term 1** | **Topics:**<br>• The history and development of flat-pack furniture and its relevance in modern design<br>• Conducting SWOT analysis to evaluate design ideas and user needs<br>• Understanding and applying scale factors in technical drawings and models<br>• Properties, types, and applications of manufactured boards<br>• An introduction to British Standards and their role in ensuring quality, safety, and consistency in design and manufacturing | **Students will:**<br>• Develop practical skills using hand tools to work with manufactured boards<br>• Learn how to design using CAD software, with a focus on Fusion 360<br>• Create and apply templates to support accuracy and repeatability in manufacturing<br>• Gain an introduction to CNC routing, including how digital designs are translated into machine processes |
| **Spring Term 2** | **Topics:**<br>• 3D Computer-Aided Design (CAD)<br>• Tolerances and Fit<br>• Additive Manufacturing (3D Printing)<br>• Evaluation and Iteration | **Students will:**<br>• Learning how to use CAD software to design a Lego-style figure, focusing on accuracy, symmetry, and understanding how components fit together.<br>• Understanding the importance of measurements and tolerances when designing interlocking parts, ensuring that components can be assembled effectively after printing.<br>• Gaining knowledge of the 3D printing process, including how digital models are sliced, printed layer by layer, and how print settings affect the final outcome.<br>• Developing the ability to test, evaluate, and refine designs based on how well the printed components function, promoting an iterative approach to design improvement. |
| **Summer Term 1** | **Topics:**<br>• Architectural Styles and Influences<br>• Form, Function, and Aesthetics<br>• Technical Drawing and Scale | **Students will:**<br>• Understanding key architectural movements (such as Modernism, Art Deco, or Brutalism) and how cultural, historical, and environmental factors influence building design.<br>• Exploring how buildings are designed to meet user needs, suit their environment, and express visual appeal through shape, material, and proportion.<br>• Learning how to produce accurate architectural drawings using plan views, elevations, and sections, and how to apply scale effectively. |

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| **Summer term 2** | **Topics:**<br>• Sustainable Architecture<br>• Modelling and Communication | **Students will:**<br>• Investigating how materials, energy efficiency, orientation, and construction methods contribute to environmentally responsible building design.<br>• Developing skills in physical and/or digital model-making to represent architectural concepts clearly and convincingly for a target audience or client. |

**Homework:**
Homework is set on Class Charts for every six hours taught Homework will comprise a presentation on a specific designer, of the students choosing, and how their work has affected modern life and revision for tests

**Assessment:**
Formative verbal and other feedback Exploration grade (research), Create grade (making), Evaluation grade, Principles grade through a multiple-choice test and presentation skills and content grade.

**Links to Personal Development:**
Dexterity and hand skills. Self-evaluation of work. Presentation skills. Research/analytical skills.

**How is my knowledge developed further at GCSE?**
Product Design GCSE.
Design and making of timber products (including relevant theory) is developed.
Design and making of Products using CAD/CAM, as used in industry (including relevant theory) is developed.
Deeper knowledge and understanding of materials, processes and the core knowledge required of a Product Designer is furthered.
This is a good preparation for the A level in Product Design**.**