At Key Stage 4, pupils hone their CAD skills using 3D CAD to design and modify their ideas, as well as developing their knowledge of CAM such as laser cutting and 3D printing. Projects are more sustained, which allows pupils to experience the design process in more depth. In Year 10, pupils design and 3D print a seating solution inspired by Charles Rennie Mackintosh, then then go on to design and manufacture a prototype for a storage solution for something precious, this is for a specific user, not themselves in order to make the process more authentic. For example, a pupil may design and make a bespoke box for a baptismal gown, shawl, candle and cards. In Year 10, pupils receive formal technical knowledge lessons to deepen their understanding of the industry, this continues into Year 11. In Year 11, pupils complete one extensive project as part of the GCSE.

| KS4 | Understanding users, contexts and purpose | Generating, developing, modelling and communicating ideas | Planning | Practical skills and techniques | Own ideas and products | Existing products | Key events and individuals | Making products work |
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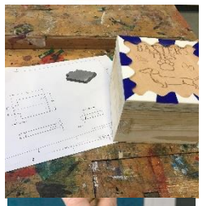
| Year 10<br><br>Technical Knowledge<br><br>Innovation Challenge<br><br>3D Printed Seating Model<br><br>Storage Box<br><br>Precious Item Storage | Pupils explore a wide range of contexts which are posed to them through a number of design projects.<br><br>Pupils develop a truly user-centred approach, developing their own contexts.<br><br>  <br>  <br>  | Pupils generate and use specifications with ease to help shape their ideas.<br><br>Pupils are able to use creative thinking techniques to avoid design fixation.<br><br>Pupils are able to generate design ideas in a range of media, especially through sketching in a variety of ways.<br><br>Pupils have developed extensive skills in 3D CAD and are able to make adjustments to their ideas easily. | Pupils are able to select and use a wide range of tools and equipment in order to model and manufacture, including CAD and CAM.<br><br>Pupils are more aware of a wide range of materials and components to create products.<br><br>Pupils are able to accurately cost the manufacture of a products, including 3D printed products.<br><br>Pupils can articulate their planning and decisions they have made through development via written text and orally. | Pupils are able to choose the most appropriate way to manufacture a product, drawing on their knowledge of tools, equipment joining and finishing.<br><br>Pupils are more aware of 3D printing and what is required to finish 3D printed parts accurately. | Pupils are able to select appropriate methods to evaluate their products in use and modify them to improve performance and produce short reports, making suggestions for improvements. | Pupils consider the environment more, including the impact that people and products have on the environment. | Pupils learn more about the art nouveau movement, specifically through the work of Charles Rennie Mackintosh.<br><br>Pupils learn about classical design, especially in the design and manufacture of storage items. | Pupils explore how mechanical devices can change direction and speeds of movement. They explore a systems approach to design including mechanical and electronic systems.<br><br>Pupils exploit their knowledge of electronics to make their products more functional.<br><br>Pupils use their maths knowledge regularly to explore more complex applied problems.<br><br>Pupils are able to adjust machinery with accuracy to produce high quality products, including 3D printing.<br><br>Pupils learn about an extensive range of materials, including textiles, technical textiles, paper and board, metals, polymers, composites, smart and modern materials and timbers.<br><br>Pupils learn about new and emerging technologies.<br><br>Pupils learn about forces and stresses and how these impact the design of products. |
| Year 11<br><br>Technical Knowledge<br><br>NEA | Pupils develop a truly user-centred approach, selecting and developing one context in some depth. | Pupils generate and use specifications with ease to help shape their ideas.<br><br>Pupils are able to use creative thinking techniques to avoid design fixation.<br><br>Pupils are able to generate design ideas in a range of media, especially through sketching in a variety of ways.<br><br>Pupils have developed extensive skills in 3D CAD and are able to make adjustments to their ideas easily. | Pupils are able to select and use a wide range of tools and equipment in order to model and manufacture, including CAD and CAM.<br><br>Pupils are more aware of a wide range of materials and components to create products.<br><br>Pupils are able to accurately cost the manufacture of a products, including 3D printed products.<br><br>Pupils can articulate their planning and decisions they have made through development via written text and orally. | Pupils are able to choose the most appropriate way to manufacture a product, drawing on their knowledge of tools, equipment joining and finishing.<br><br>Specialist processes including turning and vacuum laminating may be used. | Pupils are able to select appropriate methods to evaluate their products in use and modify them to improve performance and produce short reports, making suggestions for improvements. | Pupils consider the environment more, including the impact that people and products have on the environment. | Pupils learn about a wide range of individuals in the design world, from a whole host of design eras. | Pupils exploit their knowledge of electronics to make their products more functional.<br><br>Pupils develop an extensive technical knowledge of timbers, including their sources and origins, working with timber, commercial practices and surface treatments and finishes.<br><br>Pupils use their maths knowledge regularly to explore more complex applied problems.<br><br>Pupils develop their knowledge of commercial manufacture, including quality assurance/control and scales of production.<br><br>Pupils learn more about the design process more generally, including project management, design skills, material management and the application of surface treatments and finishes. |