

Year 9

In Year 9 students work more independently, producing projects offering greater challenge to create products of their own design. They work to a higher standard in both designing and making and become more able to explain and justify the decisions they make regarding the development and execution of the final artefact.

Casting project: Students develop knowledge and understanding of the casting process and how it is used in industry. They then apply this through a practical task to create an artefact of quality. They also learn about different manufacturing processes (including sand and die casting) and the advantages / disadvantages of each. In addition, they use CAD to create a design which is cut-out using the laser Cutter. This introduces them to the concept of computer-aided-manufacture (CAM) and develops their understanding of more modern manufacturing techniques and processes.

The final casting is produced using the CAD / CAM mould students designed in combination with a blowtorch and brazing hearth to actually melt the metal ready for pouring. Health and safety considerations are paramount throughout this process. The moulds is made in MDF and a strong emphasis is placed on the importance of quality finish and assembly of it, alongside the filing and finishing of the project itself. to casting to produce a high quality product. Students gain a better knowledge and application of the process of CAD and CAM and are introduced to the laser cutter which is used at GCSE to good effect.

Computer Aided Design project: This is a design challenge taught over 6 lessons. Building on the skills and knowledge taught in previous years, students develop their CAD skills to design a 'Grand Design' house. This gives them the opportunity to develop their iterative design skills and produce virtual models using CAD. This task reinforces and extends students' prior knowledge, understanding and skills and it is, by its nature, more challenging. Students are expected to set themselves challenges which require greater depth and a broader range of initial ideas than in previous years, recognising the need to accept individualised targets which take them beyond their comfort zone!

Automata project: This project allows students to develop construction skills in wood that would be useful at GCSE. Students gain knowledge of joining wood using accurate joining techniques and of mechanical mechanisms to design a moving, working toy. They need to demonstrate real accuracy when joining and drilling the product to ensure proper form, function and overall strength of the final piece. They will use a wider range of hand and machine tools, more independently and confidently, including; steel-rules, the bench hook and tenon saw to cut a frame, the marking gauge to mark-out lap joints, PVA glue to fix the frame together, the pillar drill, disc sanding machine and the electric fret saw to cut out the moving elements of their design. They also develop modelling skills to make a working prototype.

In a textiles project, students will look at environmental and moral issues based in design (especially fashion). They will look at sustainability and the 6 r's before designing a hat made from fleece (made from recycled plastic). They will identify a User and produce designs that would suit. They will also use modelling to modify a base pattern and create the correct size and shape for their user and to solve any problems that might occur. They will continue to develop their practical skills to make a product accurately. If time permits they will have time to make items for premature babies - part of quilts or hats - to be given to the hospital.

Students choose their GCSE courses at the end of Year 9. The Design & Technology GCSE syllabus available to students during 2019 – 2-20 is GCSE Design & Technology Resistant Materials (AQA) 8552.