

Design, Technology & Engineering

Curriculum Intent

Key Stage 3

Year 7	Year 8	Year 9
<p>Setting a baseline of expectation of achievement from key stage 2.</p> <p>Build key skills of tools, equipment, processes and health and Safety.</p> <p>Understand the design process.</p> <p>Be able to work and have knowledge of a range of materials.</p> <p>Produce a maze with accuracy. Students will learn basic workshop tools and joining techniques as well as CAD and use of the laser cutter.</p> <p>Produce a working mono speaker circuit and incorporate this into a casing using creative skills and technical ability.</p>	<p>Students have had a broad introduction to Design, Technology and Engineering.</p> <p>The intention now is to build on their subject knowledge of materials and manufacturing processes and allowing students more independence in their design and eventual outcomes using prior knowledge and skills in CAD/CAM to produce commercially viable lamp.</p> <p>Students analyse and evaluate their progress in more detail to inform appropriate changes and modifications in their practice that could be used in their progression to year 9.</p>	<p>Students now understand the use of CAD and how it can apply to a project. They use their knowledge of tools, processes and equipment with some skill and precision to produce a wooden game of their choice.</p> <p>The students will learn further CAD processes that they can incorporate in their work. The students need to assess their work against a specification and cost up their project, (linking with requirements at GCSE and GCE).</p> <p>To aid potential progression into Engineering the students work on a small set of mechanisms problems and tasks to aid their understanding.</p>

Key Stage 4

Year 10	Year 11
<p>AQA GCSE Engineering</p> <p>During the first term the students learn a range of Engineering skills and practical processes using materials and techniques gained during key stage 3.</p> <p>They also begin to produce more complex technical drawings and evaluate/assess the processes.</p> <p>The students then progress onto electronics. These are more complex circuits than those produced in year 7 and 8 but use the skills gained in soldering.</p> <p>The students also learn to program some of the circuits that uses the skills gained in Key stage 3 during computing lessons.</p> <p>The course progresses into building in mechanisms and structures learnt during KS3 Physics and DT lessons.</p> <p>During the final term the students will begin their NEA with the aim of completing the first section for the first term back in year 11.</p>	<p>Students complete the first section of their NEA which progresses to the design development and prototyping section during the first term.</p> <p>The practical aspect of the project incorporates mechanical and electronic parts.</p> <p>Their design folder will consist of investigations into the devices they are aiming to produce and design concepts to show their ideas.</p> <p>Through modelling and testing they build a final working prototype showing understanding of its workings and the systems used. This will then be tested against the original specification and expectation.</p> <p>The students use knowledge gained through key stage 3 and year 10 activities to produce this piece. They will also spend time learning the theory knowledge required through practice examination questions and activities.</p> <p>The knowledge gained in the NEA and theory of materials and manufacturing will give the students a good grounding if they progress to A level.</p>

A Level

Year 12	Year 13
<p>AQA Design and Technology</p> <p>Building on knowledge and skills gained at KS3 and KS4 (for students from AHS, outside applicants checking prior attainment). Students build on their skills and knowledge base at a higher setting expectations of quality and detail early on in the course.</p> <p>Working from the AQA examination board specification students carry out a range of research tasks and activities that is reinforced through practical tasks and small focused projects.</p> <p>Students are prepared for the examination format through regular practice of exam questions that are then reviewed for understanding to ensure they are confident with the contents.</p>	<p>Year 13, the focus is predominantly on the NEA allowing students to produce a body of work that is context lead working closely with a client. The purpose of this is to demonstrate their understanding of both theory and manufacturing process evidenced as a practical outcome/working prototype. This will also enable the students to build a portfolio of work that will interviews at a university.</p> <p>In addition students are given practice exam style questions and preparation for the written paper and review and revise theory content. This theory knowledge delves deeper into the materials and manufacturing methods used in industry and develops more of a working knowledge of the processes including CAD/CAM and automation.</p>

Curriculum Implementation

Key Stage 3

Year 7	Year 8	Year 9
<p>Students are taught the correct Health and Safety techniques for the workshop. They gradually develop confidence with the materials and equipment. They currently produce an MP3 speaker/ docking station and a wooden framed maze game.</p>	<p>The students build on the knowledge gained during year 7 and the focus this year is design and structures. They first work in teams to produce structures which are tested using different rigs. This follows onto a lamp project.</p>	<p>At this point in Key Stage 3 the students are more confident in the workshop and are able to improve and enhance their designs using a range of techniques including 3D printing, Sublimation and Laser cutting. They design a wooden game of their choosing and also improve their Graphical abilities and basic mechanics by producing Popup products.</p>

Key Stage 4: GCSE (AQA)

Year 10	Year 11
<p>AQA Product Design</p> <p>During this year the students are set a number of Designing and practical tasks to improve their confidence and abilities as designers. They will further develop their theoretical knowledge of materials and processes to aid in their Controlled Assessment piece in Year 11.</p> <p>Practical assessment of skills</p> <p>Batch production</p> <p>A range of practical projects</p> <p>Computer Aided Design and machinery</p> <p>Product Analysis and Development</p> <p>Evolution of Product Design</p> <p>Selection of Controlled Assessment Tasks</p> <p>Exploration of context and brief</p> <p>Primary project research</p>	<p>Students focus on their Controlled Assessment piece during this year. They choose a product to Design and Make for a client group.</p> <p>Non Examined Assessment (NEA) worth 50% of the final grade</p> <p>Design idea development and modelling</p> <p>Revision for summer examination</p>

Key Stage 5: A Level (AQA)

Year 12	Year 13
<p>Project for Non Examined Assessment (NEA)</p> <p>Design creation and development</p> <p>Modelling throughout a variety of material areas development of a design solution</p> <p>Materials, Components and Application</p> <p>Production of practical pieces</p> <p>Design and Market Influences</p> <p>Processes and Manufacture</p> <p>Revision for examination</p>	<p>Selection of Project for Non Examined Assessment (NEA)</p> <p>Development of design ideas through modelling</p> <p>Design and Market Influence</p> <p>Production and evaluation of final product</p> <p>Processes and Manufacture</p> <p>Revision for examination</p>

Impact

Key Stage 3

Students in year 7 are given health and safety advice on tools, materials and machines used. This is based on hopefully prior knowledge but we have found it best to re implement to each group as machines, tools and materials are used. Year 9 often forget prior and very important knowledge and this need re enforcing. Students in year 7 are charged for the material costs . This helps to ensure the department can pay for not only the necessary materials but the re-newed equipment required. This has already had a very big impact ensuring that we have whole class amounts of some of the tools required by each student. Year 7, 8 and 9 produce exciting and original results to the projects each year.

Key Stage 4

GCSE Engineering replaced Design and Technology 3 years ago. The changes from Product Design really impacted what parents understood about the subject. The move to engineering has allowed teaching staff to use knowledge of the subject they had accrued over the years compared to the new Product design specification. As this is a new specification and is taught primarily at GCSE by one member of staff the subject continues to increase in popularity. Some of the booklet, teaching and practical materials have changed over the years with experimentation how things work with group sizes and availability of machines required. Some excellent results since the new specification started.

Key Stage 5

The content has worked well between the two teachers ensuring that the students gained the knowledge of the specification. Materials were shared with the students and tutorials worked really well with the individuals to ensure they continued to progress. New techniques for manufacturing are taught during this period that they would not have during key stage 3 or 4 which enable more complicated and creative design work.