

 Design & Technology	Intent A level Product Design is a creative and thought-provoking qualification gives students the practical skills, theoretical knowledge and confidence to succeed in a number of careers. Especially those in the creative industries. They will investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put their learning in to practice by producing prototypes of their choice. Students will gain a real understanding of what it means to be a designer, alongside the knowledge and skills sought by higher education and employers.			
Year 12	Technical Principles (AO3 and AO4) (September - January)	Design and making principles (AO3 and AO4) (September -May)	Practical mini-projects (AO1, AO2, AO3 and AO4) (October - March)	NEA Preparation (AO1, AO2) (April - July)
Knowledge (facts, information, concepts and key terminology)	<ul style="list-style-type: none"> Materials and their applications Testing materials Enhancement of materials Forming, redistribution and addition processes The use of finishes The use of finishes Modern and industrial commercial practice Digital design and manufacture Product design and development Health and safety Design for manufacturing, maintenance, repair and disposal Enterprise and marketing in the development of products Performance characteristics of materials: 	<ul style="list-style-type: none"> Design methods and processes Design theory Technology and cultural changes Design processes Critical analysis and evaluation Selecting appropriate tools, equipment and processes Accuracy in design and manufacture Responsible design Design for manufacture 	<ul style="list-style-type: none"> Model phone Phone holder Marking and cutting traditional joints Cup holder Dyson vacuum disassembly Desk tidy 	<ul style="list-style-type: none"> Identifying and investigating design possibilities Producing a design brief and specification Development of design proposal(s) Use primary and secondary research data to identify a design problem, an intended user/ client to ascertain needs & requirements. Summarise findings to write a design brief specification for the problem identified. Generate design ideas using a range of different design strategies to avoid fixation. Communicate, record, and justify design ideas including material & component selection.
Understanding (ability to connect and synthesise knowledge within a context)	<ul style="list-style-type: none"> How computers & automation impact manufacturing through robotics, CAD & CAM. How new technologies need to be developed/ sustainably to reduce environmental impact. The primary sources and properties of a range of materials. How power is generated through renewable and non-renewable energy sources. The principles of different electronic systems. Recognise and describe different types of materials and their properties related to their chosen specialism. Select suitable materials for form, functional performance, and aesthetics appropriate to a specific task. Use specialist tools and equipment to accurately manufacture products safely. Apply knowledge to shape, join and finish materials. How products are produced in different volumes Use of volume, percentages, ratio, surface area. Construction and analysis of graphs. 	<ul style="list-style-type: none"> How primary and secondary data can be collected to assist the understanding of client and user needs, writing a design brief & specification. Investigating the work of other designers and design companies to inform designs. How to develop, communicate, record, and justify design decisions. Apply knowledge of cutting, shaping, joining, and finishing materials to manufacture a prototype product. Use of trigonometry Use of statistics and probability as a measure of likelihood Students should be aware of, and able to discuss, how key historical design styles, design movements and influential designers. Be aware of how socio-economic influences have helped to shape product design and manufacture. Be aware of the responsibilities of designers and manufacturers 	<ul style="list-style-type: none"> How to respond to a design context through focused analysis. Summarise findings of primary & secondary investigation sources to write a design brief and specification. Develop design proposals for an identified user using a range of appropriate techniques. Evaluate their work as it develops to ensure their product meets the requirements of the context/user. How designers analyse information in response to a context or brief. Generating ideas suitable for an intended user or audience. Use specialist tools and equipment to accurately manufacture products safely. Apply knowledge to shape, join and finish materials. Test, evaluate and refine ideas and practical work as it develops and review success & areas for improvement for the intended product use and its user. 	<ul style="list-style-type: none"> How to respond to a design context through focused analysis. Summarise findings of primary & secondary investigation sources to write a design brief and specification. Develop design proposals for an identified user using a range of appropriate techniques Evaluate their work as it develops to ensure their product meets the requirements of the context/user.
Skills (successful application of knowledge and understanding to a specific task)	<ul style="list-style-type: none"> Recall how computers & automation influence manufacturing systems. Apply CAD & CAM to model ideas and design proposals. Recognise the impact materials have on society & the environment and implement responsible design when selecting materials for prototypes. Identify and characterise different types of materials and their properties for an intended use. Recognise common electronic systems & components and the functionality they perform. Select appropriate materials for a specific task considering form, function performance, and aesthetics. Identify the correct tools, machines, equipment & process for materials. Use specialist tools, equipment & machinery accurately and safely to cut, shape, join, finish and materials to manufacture a prototype product. Link the use of relevant specialist tools, equipment & processes to the appropriate level of commercial production. Calculation of quantities of materials sizes and costs. Representation of data used to inform design decisions and evaluation of outcomes. Presentation of market data, user preferences, outcomes of market research. 	<ul style="list-style-type: none"> Analyse the context, primary & secondary sources to identify a need and potential client and write a design Brief & Specification. Formulate ideas that are fit for purpose and suited to client/user needs and requirements based on investigation. Use specialist tools, equipment & machinery accurately and safely to cut, shape, join, finish and materials to manufacture a prototype product. Test, evaluate and refine ideas as they develop to review success & areas for improvement. Calculation of sides and angles as part of product design Interpret statistical analyses to determine user needs and preferences. Use data related to human scale and proportion to determine product scale and dimensions. Be able to discuss, key design styles and movements and their principles of design Discuss, how socio-economic influences have helped to shape product design and manufacture. Able to discuss, the responsibilities of designers and manufacturers, including use of sustainable materials, development of products that are not offensive to people of different race, gender or religious beliefs. 	<ul style="list-style-type: none"> Analyse the design context and primary & secondary existing research to identify a need and potential user to formulate ideas that are fit for purpose. Create a design Brief & Specification for a project. Apply knowledge of different design strategies and understanding of material properties to develop design proposals that fulfil the requirements of the design context, client/user needs requirement. Test, evaluate and refine ideas as they develop to review success & areas for improvement. Generating ideas suitable for an intended user or audience. Identify the correct tools, machines, equipment & process for materials. Use specialist tools, equipment & machinery accurately and safely to cut, shape, join, finish and materials to manufacture a prototype product. Test, evaluate and refine ideas and practical work as it develops to review the products success & areas for improvement. 	<ul style="list-style-type: none"> Analyse the design context and primary & secondary existing research to identify a need and potential user to formulate ideas that are fit for purpose. Create a design Brief & Specification Apply knowledge of different design strategies and material properties to develop design proposals that fulfil the requirements of the design context and identified user. Test, evaluate and refine ideas as it develops and review success & areas for improvement.
Formal Assessments (those done by all/vast majority of the cohort)	Written assessment in November will consist of questions from previous AQA Paper 1 Technical Principles focusing on the content covered to date.	Written assessment in Marchy will consist of questions from previous AQA Paper 2 Design & Making Principles focusing on the content covered to date. End of year assessment in May will consist of previous AQA Paper 1 & Paper 2.	Teacher assessment will take place following the completion of each mini project.	Teacher assessment will take place following the completion of each NEA assessment objective and work will be marked and internally moderated.
By the end of the year students on course for at least a grade C will be able to: <ul style="list-style-type: none"> Demonstrate appropriate knowledge and understanding of Technical and Design & Making principles. Analyse and evaluate to draw plausible conclusions which are supported by evidence. Apply appropriate terminology, technical language including methods of communication through formal drawings and annotated sketches including CAD and modelling. Extensively explore contexts to develop functioning prototypes; demonstrating safe and effective design, making and technical skills. Apply mathematical skills and scientific knowledge to make accurate calculations which inform choices in both theoretical and practical contexts. 				