AQA A-Level Design & Technology: Product Design [7552]

Curriculum Intent

It is our intent in A-Level Design & Technology: Product Design, to offer our students the chance to use creative thinking, problem solving and design and making skills, within a defined purpose to produce tangible outcomes. Through a variety of creative and practical activities, pupils are taught the knowledge, understanding and skills needed to engage in a process of designing and making, and comprehend the creative and manufactured world around them. They work in a range of contexts through our wide range of subject topics, to design, make and evaluate a variety of different practical outcome based projects.

A-Level Design and Technology: Product Design will prepare students to participate confidently and successfully in an increasingly technological world. Students will gain awareness and learn from wider influences on Design and Technology including historical, social, cultural, environmental and economic factors. Students will get the opportunity to work creatively when designing and making, and apply technical and practical expertise.

Through the study of Product Design, students acquire a broad range of subject knowledge and draw on and enhance their application of disciplines such as mathematics, science, engineering, computing, ethics and art. Students learn how to, and are encouraged to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, students will develop a critical understanding of its impact on daily life and the wider world. Design & Technology students will learn about the wider impact of global issues such as Sustainability and modern manufacturing techniques as well as the development of modern materials and manufacturing processes, this will ensure that our students are equipped and empowered with the skills and knowledge that they need to make a positive difference to our society and become well rounded knowledgeable citizens. High-quality design and technology education, makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

This A-Level allows students to study core technical and designing and making principles, including a broad range of design processes, materials techniques and equipment. Students will also undertake a major coursework design project where they will investigate a live client's needs, then design and make a product that solves their client's problem.

Year	Curriculum	Term & Week Commencing		Theory content	NEA Coursework / Focused Practical Task
	3.2 Designing & Making Principles	Pre-course preparation task		**Design theory (Part 1)** Students wanting to study Product Design should have a natural interest in this topic and a desire to learn and be inspired by the work of designers. They should be interested in design styles and movements and be intrigued by design influences. The task set surrounding this section of the course, enables students to really show us what they're made of, in terms of their ability to research and communicate through language, ICT and drawing. We are able to determine the effort and capability of our students at the very start of the course and put in effective intervention from the off. Students will need to apply their knowledge and understanding of this topic in their Designing & Making Principles examination. Students will build upon their existing knowledge of this topic, from their studies in Year 8 and Year 10.	**Assignment 1:** **Designers and their work** **Assignment 2:** **Design styles and movements** 3.2.2 Design theory - Design influences - Design styles and movements - Designers and their work
12	3.2 Designing & Making Principles	Autumn	Wk 1	**Collaborative design for ideas generation** • Collaborative working • The cyclic nature of commercial design and manufacture • Ideas generation: 4x4, SCAMPER and Thinking hats 3.2.4 Design processes. - The iterative design process in industrial or commercial contexts. Students tend to be quite uncommunicative and can on occasions lack confidence at the beginning of the course. It is important that students are given the confidence and range of skills to support them to overcome this quickly and are able to communicate effectively. The curriculum is designed to enable students to quickly start to engage with a design problem for them to solve as a team, just as a group of	**Communicating design ideas: Isometric drawing** 3.1.14 Design communication (Part 1) - 3D drawing - Isometric - One-point perspective - Two-Point Perspective - Thick/thin line technique - Mixed media and rendering In order to deliver embedded-learning, the theory of this module is run in parallel with focused practical tasks, that include the making of technical drawing tools these also support the fundamental principles of CAD (Computer Aided Design).

				designers would in industry. They must work together and then present their proposal to the rest of the class. This encourages all students to play an active role in the task and helps them overcome any inhibitions, preparing them to be able to confidently discuss design proposals later in the course. Students will be familiar with generating design ideas, as they have experience of doing this throughout KS3 and KS4. However, they will not have had experience of executing this task in a group situation nor to such a high level, this will prepare students for later sections such as the NEA.	
12	3.1 Technical principles	Autumn 1	Wk 2	**Polymer processes** • Identification of manufacturing processes. • Injection moulding process • Moulds • British Plastics Federation • Processes 3.1.4 Forming, redistribution and addition processes. - Polymer processes During Autumn term 1 we focus on Polymers. Polymers are used in a wide range of products and are one of the most important groups of materials for students to research. Students should already be familiar with polymer characteristics from their studies at KS3, have some existing knowledge of polymer processes from KS4, which they can now develop further into a greater level of detail around wider aspects of their application, introducing them to a wide range of industrial processes and enhancement techniques. This material area leads us on to studying Biodegradable polymers, design for manufacturing, repair and disposal and the disassembly of products. Polymers are the ideal material selection for the subsequent areas of study and enable the students to feel confident and make rapid and	**Communicating design ideas: Isometric drawing** 3.1.14 Design communication (Part 1) - 3D drawing - Isometric - One-point perspective - Two-Point Perspective - Thick/thin line technique - Mixed media and rendering **Focused practical tasks:** **Identification of manufacturing processes using physical objects.** **Studying an aluminium injection moulding mould first hand.** **Studying an aluminium injection moulding and use this to create shock-absorbing feet to complement the practical exercise (Box of Skills).** A large part of this unit has been taught to students who have previously attended Ecclesbourne school in KS3 and KS4 and this will be a recap opportunity for most, however taught to a greater level of depth in a spiral curriculum

				sustained progress early on in the course. Students will need to be able to select the correct processes for products, describe the processes using notes and diagrams, and justify their selection for the Technical Principles examination.	plan. The skills that students will develop and secure in this unit will allow them to develop greater communication skills to be able to use visual presentation skills which will enable them to communicate intentions with more confidence as well as prepare students for the Design communication aspects of their NEA coursework.
12	3.1 Technical principles	Autumn	Wk 3	**Polymer processes continued** • Vacuum forming • Thermoforming • Calendering • Line bending • Lamination (lay-up) • Blow moulding • Rotational moulding • Extrusion • Compression moulding **Performance characteristics of Polymers** • Source • Classifications • Thermoplastics • Thermoset plastics • Stock forms 3.1.4 Forming, redistribution and addition processes. - Polymer processes 3.1.2 Performance characteristics of materials - Performance characteristics of polymers Students will have had previous experience of these topic areas in KS3 and KS4, however this will be re-visited and taught in a greater level of detail with wider application understanding. This unit has been selected to be taught at this point to enable students to have a broad depth of understanding of a range of materials that they will need to understand when applying the knowledge to such areas a production methods, finishing techniques and scales of	**T-square (2 hrs)** 3.1.4.5 Jigs and fixtures 3.1.2 Performance characteristics of woods, in particular, manufactured boards and their suitability for use in Computer Aided Manufacture and for the commercial production of products in quantity. Students that studied previously at Ecclesbourne school will have previously been taught both topic areas before, however it is important to revisit them, reinforcing learning. This will be recapped through the application of a practical activity, where students will be able to solidify and demonstrate their understanding by producing a practical outcome, the artifact that will be produced will then be used by the student throughout their studies for the presentation of their Design work. Both topic areas are vital I preparation for the Unit 1 exam but also in enabling students to select appropriate materials for situations, being able to confidently discuss their working properties.

				manufacture as well as greatening their greater level of understanding generally about suitability of materials both physically and also environmentally, empowering students to be responsible designers considering greater impacts that choices of materials can have beyond the product. It will also enable students to correctly discuss the suitability of materials for design tasks as well as prepare them for their Unit 1 examination and indeed their NEA.	
12	3.1 Technical principles	Autumn 1	Wk 4	**Performance characteristics of polymer based sheet and film.** • Different types of polymer-based sheet and film • **Performance characteristics of Elastomers.** • History • Applications • Classification of elastomers • **Performance characteristics of Biodegradable polymers.** • Oxy-degradable polymer • Photodegradable polymer • Hydro-degradable polymer • Classification of biodegradable polymers 3.1.2 Performance characteristics of polymer based sheet and film 3.1.2 Performance characteristics of Elastomers 3.1.2 Performance characteristics of Biodegradable polymers Our aim is to produce the next generation of responsible designers (and consumers). Students must consider all aspects of the selection of and overall impact that materials could have on our environment. Students therefore should build on their knowledge of biodegradable polymers from their studies at KS4 and realise their potential in producing products and the benefits of using them over non-biodegradable polymers at the end of the product's life.	**T-square (2 hrs)** 3.1.4.5 Jigs and fixtures Metal – bending / rolling Wood – traditional; comb etc. / PMC's ("pre-manufactured standard components" and their use in commercial manufacturing); e.g. bolts and KD fittings. component; bolts and KD 3.1.2 Performance characteristics of woods **Focused practical tasks: Vacuum forming and line bending** 3.1.2 Performance characteristics of polymer based sheet and film This focused practical, again will form an opportunity to re-enforce and embed the theory being taught to students in this unit. It will also develop student's practical application of these skills, developing a wider range of stills which students can use to apply a greater depth of understanding to allow students to succeed in subsequent areas of the course including Unit 1, Unit 2 examinations and their NEA and their onward Further education experiences.

12	3.1 Technical principles	Autumn 1	Wk 5	**Enhancement of materials: Polymers** • Additives to make polymers easier and less expensive to process • Additives to enhance aesthetics • Additives to improve function • Additives to prolong life (prevent degradation) • Additives to encourage degradation • **The use of finishes: Polymers** • Adding colour in the moulding process • Acrylic spray paints • Overmouldings 3.1.3 Enhancement of materials 3.1.5 The use of finishes Students will apply their existing knowledge of enhancements and the application of finishes to this topic area of polymers, in order for them to fully understand that the material's properties can be improved to better suit the requirements of the final product. This knowledge will be examined in their Technical principles Unit 1 examination, and could also form part of the knowledge needed for the Unit 2 examination. This knowledge will allow students to make more informed decisions about material selection during their NEA, which will commence at the beginning of Spring Term 3.	**T-square (1 hr)** 3.1.4.5 Jigs and fixtures 3.1.2 Performance characteristics of woods **Introduce 'Box of skills' project.** **- Batch of laser cut boxes using CAD/CAM.** 3.1.6 Modern industrial and commercial practice - Scales of production 3.1.6.2 Efficient use of materials - The use of computer systems 3.1.7 Digital design and manufacture - Computer aided design (CAD) Computer aided manufacture (CAM) **Box of skills: Planishing aluminium (1 hr)** 3.1.2 Performance characteristics of materials - Performance characteristics of metals 3.1.3 Enhancement of materials - Metal enhancement 3.1.5 The use of finishes - Metal finishing Introduction of the **"Journal"** to record each material, tool and process used during the making of the T-square and Box of Skills. The habit of recording, analysing and evaluating each choice and all other considerations (be they ethical, commercial or merely practical) is practiced here prior to starting the NEA. A successful NEA is a sophisticated document and will need to evidence, with clarity, the appropriate technical vocabulary and analytical thinking required at this level of study. Feedback on journal entries will familiarise students with the depth of engagement expected and prepare them for the demands of completing each section of the NEA when

					that commences later in the year. This focused practical, again will form an opportunity to re-enforce and embed the theory being taught to students in this unit. It will also develop students practical application of these skills, developing a wider range of stills which students can use to apply a greater depth of understanding to allow students to succeed in subsequent areas of the course including Unit 1, Unit 2 examinations and their NEA and their onward Further education experiences.
12	3.1 Technical principles	Autumn 1	Wk 6	**Design for manufacturing, maintenance, repair and disposal (focusing on Polymers)** • Choice of materials • The 6 R's of sustainability • Recycle • Reduce • Refuse • Repair • Rethink • Reuse • Upcycling • Maintenance • **Ease of manufacture** 3.1.11 Design for manufacturing, maintenance, repair and disposal Manufacture, repair, maintenance and disposal - Manufacture, repair, maintenance and disposal - Ease of manufacture Students will be familiar with The 6R's of sustainability from their studies at KS3 and KS4. However, they must now develop their ability to be considerate designers, not only in terms of the environment but also for product users. Students also need to understand the importance of designing products for commercial production, to ensure they are modifying their	**Box of skills: Planishing aluminium (2 hrs)** 3.1.2 Performance characteristics of materials - Performance characteristics of metals 3.1.3 Enhancement of materials - Metal enhancement 3.1.5 The use of finishes - Metal finishing This focused practical, again will form an opportunity to re-enforce and embed the theory being taught to students in this unit. It will also develop students practical application of these skills, developing a wider range of stills which students can use to apply a greater depth of understanding to allow students to succeed in subsequent areas of the course including Unit 1, Unit 2 examinations and their NEA and their onward Further education experiences.

				designs to make them more efficient to manufacture and reduce the number of manufacturing processes. This knowledge will be examined in their Technical principles examination and will equip them with the knowledge necessary to design successful products during their NEA, which will commence at the beginning of Spring Term 3.	
12	3.1 Technical principles	Autumn 1	Wk 7	**Disassembly** 3.1.11 Design for manufacturing, maintenance, repair and disposal Manufacture, repair, maintenance and disposal - Disassembly In order to develop knowledgeable and considerate designers, students must understand the importance of disassembling products for repair or when it reaches the end of its useful life. This also enables students to examine in 'real life' how products have been made looking at a wide range of skills. This knowledge will be examined in their Technical principles examination and will equip them with the knowledge necessary to design successful, well considered, products during their NEA, which will commence at the beginning of Spring Term 3.	**Box of skills: Dye sublimate/laser cut base and assemble.** 3.1.7 Digital design and manufacture - Computer aided design (CAD) Computer aided manufacture (CAM) **Focused practical task: Product disassembly** 3.1.11 Design for manufacturing, maintenance, repair and disposal Manufacture, repair, maintenance and disposal - Disassembly Students disassemble an existing product, photographing key features to include in their write up of the activity.
12	3.2 Designing & Making Principles	Autumn 2	Wk 8	**Design methods and processes:** • Iterative design process • User-centered design • Investigative methods • The development of a design proposal • The planning, manufacture and evaluation of a prototype 3.2.1 Design methods and processes Students need to be aware of and be able to explain, different approaches to user centred design. They must understand that in approaching a design challenge there is not a single process, but that good design always addresses a	**Box of skills: Bending lid, fitting lid, drilling lid.** 3.1.2 Performance characteristics of materials - Performance characteristics of metals 3.1.4 Forming, redistribution and addition processes - Metal processes Students will be compiling an ongoing "journal of skills" record that they will recall and record the processes, materials, components and technical language used during the making of the box-of-skills and Technical Drawing tools. This journal records first-hand the

				wide range of issues. Students should be building on knowledge from their Year 9 and GCSE studies. Students need to possess this knowledge before they embark on their NEA in Spring Term 3 as well as to ensure that they understand the application of this in real world situations.	activities, rationale of the materials and processes used, for example why is hardwood and plywood used in the T square? (alternatives discussed/evaluated and noted). It is an aid memoir and forms a valuable learning devise to familiarise Year 12 students with the requirements of the NEA, which they will begin in Spring 3.
12	3.2 Designing & Making Principles	Autumn 2	Wk 9	**Design processes:** • The use of a design process • Investigations and analysis • Using inspiration materials 3.2.4 Design processes. - The use of a design process. Students need to be aware of, and be able to discuss and implement, the stages of a range of design processes in order to apply personal judgment and relevant criteria in the appraisal of products and systems in readiness for their non-exam assessment and for their Designing & Making Principles examination. Students will be building on prior knowledge from their KS3 and KS4 studies. This part of the course will be taught over 3 weeks in Autumn Term 2, in order to lead into students understanding the expectations of their NEA work.	**Box of skills: Bending lid, fitting lid, drilling lid.** 3.1.2 Performance characteristics of materials - Performance characteristics of metals 3.1.4 Forming, redistribution and addition processes - Metal processes
12	3.2 Designing & Making Principles	Autumn 2	Wk 10	**Design processes:** • Illustration • Development of a design specification • Modelling 3.2.4 Design processes. - The use of a design process. Students will be taught this section first as it underpins the knowledge and understanded needed for later units. It will be a re-cap of the key principles that students will have been used throughout our Spiral curriculum from KS3, KS4 and into KS5. Students will be able to	**Box of skills: Bending lid, fitting lid, drilling lid.** 3.1.2 Performance characteristics of materials - Performance characteristics of metals 3.1.4 Forming, redistribution and addition processes - Metal processes **Focused practical task: Modelling in Styrofoam.** Students will design and model a computer mouse for an elderly person, with restricted hand movement and reduced

				further develop their knowledge and be able to apply to a higher level. Students will use this knowledge and understanding to support the development of their NEA and also to continue to underpin the fundamentals of good design practice to prepare students for future destinations in the design world.	sensation in their fingertips. They will understand the suitability of using Styrofoam for this application. 3.1.2 Performance characteristics of materials - Performance characteristics of polymer based sheet and film - Styrofoam: modelling
12	3.2 Designing & Making Principles	Autumn 2	Wk 11	**Design processes:** • Planning • Planning in commercial manufacture • Evaluation and testing • The iterative process in industrial and commercial contexts 3.2.4 Design processes. - The use of a design process. - The iterative design process in industrial or commercial contexts. Students will be taught this section first as it underpins the knowledge and understanded needed for later units. It will be a re-cap of the key principles that students will have been used throughout our Spiral curriculum from KS3, KS4 and into KS5. Students will be able to further develop their knowledge and be able to apply to a higher level. Students will use this knowledge and understanding to support the development of their NEA and to continue to underpin the fundamentals of good design practice to prepare students for future destinations in the design world.	**Box of skills: Bending lid, fitting lid, drilling lid, epoxy of standard PMC (mechanical fixing – bolt and wing nut).** 3.1.2 Performance characteristics of materials - Performance characteristics of metals 3.1.4 Forming, redistribution and addition processes - Metal processes 3.1.4.5 The use of adhesives and fixings 3.1.7 Digital design and manufacture - Computer aided design (CAD) Computer aided manufacture (CAM) 3.2.7 Accuracy and Designing & Making; determining quantities, conservation of energy and resources- Tessellation / Nesting. A range of core skills being taught by practical application and recorded in their journals to ensure that students have a greater level and depth of understanding but also to ensure that are confident practitioners in the workshop environment. This will help to support students In their transition post A-Level, in the NEA as well as forms key parts of examination units in both Unit 1 & Unit 2 examinations.
12	3.2 Designing & Making Principles	Autumn 2	Wk 12	**Design processes:** • A-Level non-exam assessment: substantial design and make	**Box of skills:** **Dye sublimate/laser ISO drawing tool (incorporate into**

				task • Introduction • Time constraints • Format • Assessment • Section A: Identifying and investigating design possibilities • Primary techniques • Secondary techniques • Section B: Producing a design brief and specification • Section C: Development of design proposals • Section D: Development of design prototypes • Section E: Analysing and evaluating 3.2.4 Design processes - The use of a design process. - Prototype development. This part of the course will be taught towards the end of Autumn Term 2 as students will be commencing their NEA at the beginning of Spring Term 3. The information will be fresh in their minds and they will have had time to process it properly and query any areas of uncertainty before they embark on their own design process. Students will be drawing from their experience of working through a design process for their NEA at GCSE.	**"waste" of the 60/30 set square.** **CAD:** **Practice computer aided design (Techsoft 2D Design) to create a 30/60° set square to complement the T-square. Use decorative surface finish – dye sublimate. "waste" from the 30/60 square set as a challenge to create a portable "isotool". Maths; calculating waste / tessellation / reduced machine time and material consumption.** 3.1.3 Enhancement of materials 3.1.5 The use of finishes
12	3.1 Technical principles	Autumn 2	Wk 13	**The requirements for product design and development:** • Product development and improvement • Specification criteria and fitness for purpose • Critical assessment for new design development • Critical analysis – user centered design and task analysis. • Working with a variety of materials. • Accuracy of production	**Isometric tool/60° set square, decorative surface finish – dye sublimate information to recall/record key technical terms and processes.** 3.1.3 Enhancement of materials 3.1.5 The use of finishes (alternatives researched and analysed in Journal)

				3.1.8 The requirements for product design and development. - Product development and improvement. Students need to develop the skills to critically assess products and develop new design proposals. Students have a foundation of this knowledge from GCSE, upon which we build. It is key that this knowledge is secure before they begin their NEA in Spring Term 3, to enable them to design a product that meets the needs of their client. This element of the course will be taught over 2 weeks towards the end of Autumn Term 2 in readiness for them starting their NEA in Spring Term 3. Students will also need to be able to apply their knowledge and demonstrate understanding of this topic in their Technical Principles examination. We aim to encourage the next generation of designers to be reflective in their thinking and to ensure they design products that are inclusive to all members of our society.	
12	3.1 Technical principles	Autumn 2	Wk 14	**The requirements for product design and development:** • Aesthetics • Ergonomics • Anthropometrics • Design considerations for control interfaces • Inclusive design 3.1.8 The requirements for product design and development. - Product development and improvement. - Inclusive design. Developing students ability to use a variety of influences to ensure products are fully considered for their users needs. This will be examined on both Unit 1 and Unit 2 examination but will also be heavily referenced and unitised by students within their NEA.	**Isometric exploded view of finished box of skills using the drawing equipment students have made.** Using their own T-square, Box of Skills and 30/60 square! 3.1.14 Design communication (Part 1) - 3D drawing - Isometric - Thick/thin line technique - Mixed media and rendering Exploded isometric of the completed box-of-skills; to practice the ability to communicate (within ISO 124 standards) the assembly of and material/component parts and quantity required.

12	3.1 Technical principles	Autumn 2	Wk 15	**Communicating design ideas:** 3.1.14 Design communication (Part 2) - Report writing - Graphs, tables and charts - Data tables - 2D drawing - Orthographic projection - Sectional drawing Students will be taught the final instalment of 'Design Communication'. This has been engineered to ensure it aligns with the communication skills being taught in parallel to the 'Box of skills' project. It is also an opportune time for students to complete their drawings to a very good standard, over the Christmas holiday. Students will be drawing knowledge from their Maths and ICT studies as well as from Design and Technology for this topic. Students will be building on previous knowledge of Third Angle Orthographic Projection and Isometric drawing, which were introduced in Year 8 and have been developed during their GCSE studies.	**Isometric exploded view of finished box of skills using the drawing equipment they have made.** 3.1.14 Design communication (Part 2) - 3D drawing - Isometric - Thick/thin line technique - Mixed media and rendering **Communicating design ideas:** **Third Angle Orthographic projection of 'Box of skills'.** **Sectional drawing of 'Box of skills'.** 3.1.14 Design communication (Part 2) 2D drawing - Orthographic projection - Sectional drawing - 2D/3D sketching - Dimensioning / Scaling / Datum points
12	3.2 Designing & Making Principles	Spring 3	Wk 16	**Technology and cultural changes:** • Socio-economic influences • Major developments in technology • New materials • New methods of manufacture 3.2.3 How technology and cultural changes can impact on the work of designers - Socio economic influences - Major developments in technology We teach this topic at the beginning of Spring term 3, in parallel to students commencing their NEA. We do this in order for them to understand the social, moral and ethical responsibilities they must consider as new designers. Also to refresh their memory of product life cycle and how they as designers will	NEA Coursework- Students' work will consist of an investigation into a contextual challenge, defining the needs and wants of the user and include relevant research to produce a design brief and specification. Students should generate design ideas with flair and creativity and develop these to create a final design solution (including modelling). A manufacturing specification should be produced to conclude your design findings leading into the realisation of a final prototype that is fit for purpose and a final evaluation. Students should investigate, analyse and evaluate throughout the portfolio and evidence all decisions made.

				need to consider refining and re-developing product during their life cycle. Students should have some existing knowledge of this topic area from their KS4 studies, upon which to build. This is a substantial topic and will therefore be taught over 3 weeks. Students must secure this knowledge in readiness for their Design and Making principles exam and should transfer this knowledge into their NEA.	Section A - Identifying & investigating design possibilities- By analysing and selecting a contextual challenge, students will identify design possibilities, investigate client needs and wants and factors including economic and social challenges. Students should also use the work of others (past and/or present) to help them form ideas. Research should be concise and relate to their contextual challenge. Students are also advised to use a range of research techniques (primary/secondary) in order to draw accurate conclusions. Students should be encouraged to investigate throughout their project to help inform decisions. Section B – Producing a design brief and specification- Based on conclusions from their investigations students will outline design possibilities by producing a design brief and design specification. Students should review both throughout the project. Section A & B are taught in this order as they for the foundations of research and planning that students will build on the subsequent sections. Sections A-B are researching a design need then writing a design Brief and Specification using alive client, these sections will inform students designing in section C which will be taught next in the sequence. These sections will build on student's theory knowledge that they learn throughout KS3 and 4 studies as well as Year 12 to help them to design and make a product that solves a contextual problem set by the exam board. These topics and skills have been thoroughly taught
12	3.2 Designing & Making Principles	Spring 3	Wk 17	**Technology and cultural changes:** • The internet of things (IoT) • Advancements in CAD/CAM • Social. Moral and ethical issues • Poverty, health and wellbeing • Migration • Fairtrade 3.2.3 How technology and cultural changes can impact on the work of designers - Major developments in technology - Social, moral and ethical issues	
12	3.2 Designing & Making Principles	Spring 3	Wk 18	**Technology and cultural changes:** • Product life cycle 3.2.3.4 Product life cycle	
12	3.2 Designing & Making Principles	Spring 3	Wk 19	**Critical analysis and evaluation:** • Critical analysis and evaluation • Testing and evaluating in commercial or industrial contexts. • Use of third party feedback in the testing and evaluation process. 3.2.5 Critical analysis and evaluation - Testing and evaluating products in commercial products - Use of third party feedback in the testing and evaluation process This topic is taught at this point in the course to support their NEA that is running alongside their theory studies. This topic will enable students to discuss their own and commercial products, leading to possible improvements/	

				modifications of the original idea. It is important we teach this here as it will underpin their NEA work, in ensuring students know how the use of third-party feedback and testing informs the evaluation process, which is ongoing during NEA, not just at the end.	throughout the KS3 and KS4 curriculum so will be familiar to students, Students will need to apply their knowledge and understanding and skills to a context set by the exam board which is different each year.
12	3.2 Designing & Making Principles	Spring 3	Wk 20	**Accuracy in design and manufacture:** • Using measuring and marking out equipment • The importance of accuracy • Testing and the elimination of errors • Using measuring aids 3.2.7 Accuracy in design and manufacture This topic is taught at this point in the course to support their NEA that is running alongside their theory studies. This topic will enable students to use a range of measuring and marking out equipment. They will understand the importance of accuracy in manufacturing, how testing can eliminate errors and the value of using measuring aids to ensure consistency of accuracy and the reduction of human error. Some of this content, students were introduced to during Year 8 and Year 9, this was later built upon in their KS4 studies. Students will be examined in this area on their Designing and Making principles exam.	
12	3.2 Designing & Making Principles	Spring 3	21	**Design for manufacturing and project management:** • Planning for accuracy and efficiency • Quality assurance • Project management systems • Critical path analysis • Quality control • Non-destructive testing • Monitoring, checking and testing throughout production	

				3.2.9 Design for manufacture and project management - Planning for accuracy and efficiency - Quality assurance - Quality control This topic is taught at this point in the course to support their NEA that is running alongside their theory studies. This topic will enable students to understand the importance of planning for accuracy when making prototypes and quality control. Some of this content, students were introduced from the very beginning of KS3 and has been re-visited during each project. This knowledge was later built upon in their KS4 studies. Students will be examined in this area on their Designing and Making principles exam.	
12	3.2 Designing & Making Principles	Spring 4	Wk 22	**Responsible design:** • Environmental issues • Conservation of energy and resources • Circular economy 3.2.8 Responsible design - Environmental issues - Conservation of energy and resources This topic will enable students to understand the responsibility of designers and manufacturers to ensure products are made using sustainable materials and components and how to design products for minimum impact on the environment. It is important this topic is taught at this point in the course as it directly informs the NEA work they are also working on. This topic is taught after 'Technology and cultural change', which was taught at the beginning of Spring Term 3, as students can link that knowledge and apply a greater context to their understanding. Students have been introduced to this concept in their KS3 studies and will have studied it in greater depth	Continuation of Section A & Section B

				at KS4. Students will be examined in this area on their Designing and Making principles exam.	
12	3.2 Designing & Making Principles	Spring 4	Wk 23	**Selecting appropriate tools, techniques and processes:** • Selecting the correct tools and equipment • Safe working practices in a workshop situation • Maintaining safety in commercial manufacture • Development of designs from single prototypes to mass produced products. • Batch or mass manufacture and the effect on the manufacturing process. 3.2.6 Selecting appropriate tools, equipment and processes It is imperative that students are confident in selecting appropriate tools, techniques and processes during their NEA. This is the justification for students being taught this theory element before they must apply this knowledge practically during their NEA. Students have much experience of this topic area as it was introduced to them at the very beginning of KS3. Students will have greater experience of applying this knowledge in their KS4 studies, when they undertook their NEA. Students will be examined in this area on their Designing and Making principles exam	
12	3.2 Designing & Making Principles	Spring 4	Wk 24	**National and international standards in product design:** • British Standards Institution • International Standards Organisation • Restrictions of Hazardous Substances directives • Battery directive • Polymer codes for identification and recycling • Packaging directives • WEEE directive	

				• The EC energy label • Eco-labelling 3.2.10 National and international standards in product design Students must understand the importance of national and international standards in product design. They should be able to apply this to their NEA work, which is the reason it is being taught at this point. Students should use this information in their research. Students will be familiar with some of the content from their KS4 studies and we build on that. Students will be examined in this area on their Designing and Making principles exam	
12	3.1 Technical principles	Spring 4	25	**Digital design and manufacture:** • Computer aided design • Advantages and disadvantages of CAD • The use of CAD to develop and present ideas for products • CAM processes • Laser cutting • Routing • Milling • Turning • Plotter cutting • Virtual modelling • Computational fluid dynamics • Finite element analysis • Rapid prototyping processes • Fused deposition modelling/3D printing • Electronic data interchange • EPOS • Production, planning and control networking 3.1.7 Digital design and manufacture - Computer aided design (CAD) - Computer aided manufacture (CAM) - Virtual modelling - Rapid prototyping processes	

				- Electronic data interchange - Production, planning and control (PPC) networking It is important that students are able to develop and present their ideas for products and realise the benefits additive processes such as rapid prototyping have to them as designers during their NEA. This is the justification for students being taught this theory element before they must apply this knowledge practically during their NEA. Students have experience of this topic area as it was introduced to them at KS3. Students will have greater experience of applying this knowledge in their KS4 studies, when they undertook their NEA. Students will be examined in this area on their Technical Principles exam	
12	3.1 Technical principles	Spring 4	26	**Focused practical task:** Introduction to Tinker CAD. 3D print design. • Computer aided design • The use of CAD to develop and present ideas for products • Rapid prototyping processes • Fused deposition modelling/3D printing 3.1.7 Digital design and manufacture - Computer aided design (CAD) - Computer aided manufacture (CAM) - Rapid prototyping processes Students are introduced to a new piece of software that will enable them to quickly and easily 3D print their developed designs, allowing them to gain feedback and test their work throughout their NEA. They spend 2 weeks, working intensively on this. They are taught this in preparation for them embarking on this stage of their NEA.	
12	3.1 Technical principles	Spring 4	27	**Focused practical task continued:** Tinker CAD. 3D print design.	

				• Computer aided design • The use of CAD to develop and present ideas for products • Rapid prototyping processes • Fused deposition modelling/3D printing 3.1.7 Digital design and manufacture - Computer aided design (CAD) - Computer aided manufacture (CAM) - Rapid prototyping processes	
12	3.1 Technical principles	Summer 5	28	**Materials and their applications:** • Materials and applications • Material properties • Classification of materials • Metals • Woods • Polymers • Papers and boards • Composites • Smart materials • Modern Materials • Material disposal 3.1.1 Materials and their applications - Classification of materials We teach Materials and their applications at the start of Summer Term 5, as the ability to choose the best material for product manufacture is an essential skill that students must possess as designers and they must demonstrate they are able to do so during the Development of design proposals section of their NEA, which they commence this week. Students will be building on knowledge that they have acquired at KS3 and studied in greater depth at KS4. This topic of study will be assessed in their Technical Principles examination.	NEA Section C - Development of design proposal(s) – Students should explore a range of possible ideas linking to the contextual challenge they have selected. These design ideas should demonstrate flair and originality and students are encouraged to take risks with their designs. Students may wish to use a variety of techniques to communicate. Students will not be awarded for the quantity of design ideas but how well their ideas address the contextual challenge selected. Students are encouraged to be imaginative in their approach by experimenting with different ideas and possibilities that avoid design fixation. In the highest band students are expected to show some innovation by generating ideas that are different to the work of the majority of their peers or demonstrate new ways of improving existing solutions. Students will develop and refine design ideas. This may include, formal and informal 2D/3D drawing including CAD, systems and schematic diagrams, models and schedules. Students will develop at least one model, however marks will be awarded for the suitability of the model(s) and not the quantity produced. Students will also
12	3.1 Technical principles	Summer 5	29	**Materials and their applications:** • Methods for investigating and testing materials • Practical workshop tests	

				• Industrial tests **Focused practical task:** Students to carry out practical workshop tests and document the results with photographs in their write up. 3.1.1 Materials and their applications - Methods for investigating and testing materials Students must be able to select the most appropriate material for a specific application and they should know how to perform workshop tests and understand how materials are tested in industry. Students should show evidence in their NEA work that they have performed workshop tests and will be assessed on this topic in their Technical Principles examination.	select suitable materials and components communicating their decisions throughout the development process. Students are encouraged to reflect on their developed ideas by looking at their requirements; including how their designs meet the design specification. Part of this work will then feed into the development of a manufacturing specification providing sufficient accurate information for third party manufacture, using a range of appropriate methods, such as measured drawings, control programs, circuit diagrams, patterns, cutting or parts lists. Section C is taught after students have completed both sections A & B where students will research a need and write a brief and specification so they understand what their clients' needs are. Sections C and D are where students design a solution to their identified problem and then develop their idea. These sections will build on student's theory knowledge that they learn throughout Year 10 and Year 12 to help them to design and make a product that solves a contextual problem set by the exam board. These designing and development skills have been thoroughly taught throughout the KS3 curriculum so will be familiar to students. Students will then progress onto section E where they make the product that they have designed.
12	3.1 Technical principles	Summer 5	30	**Performance characteristics of materials:** • Materials selection • Stock forms • Paper and boards • Re-cap on woods • Re-cap on metals • Re-cap on polymers • Re-cap on Biodegradable polymers 3.1.2 Performance characteristics of materials - Performance characteristics of papers and boards - Performance characteristics of polymer based sheet and film - Performance characteristics of woods - Performance characteristics of metals - Performance characteristics of polymers - Elastomers - Biodegradable polymers Students will already have a solid foundation in this topic as they have been taught the performance characteristics of materials since	

				KS3 and studied it in greater detail during KS4. We teach students this topic at this point to ensure they are aware that materials selections significantly impact on the potential success of a manufactured product and that a great design may fail if the material properties are not suitable for the production line. This enables them to apply this knowledge into their Development of design proposals work in a timely manner. Students will also need to demonstrate their understanding of this topic in their Technical principles examination.	
12	3.1 Technical principles	Summer 5	31	**Performance characteristics of materials:** • Composites • Smart materials • Modern materials 3.1.2 Performance characteristics of materials - Composites - Smart materials - Modern materials Students should be familiar with this topic form their KS4 studies so this really should be a re-cap and reminder of the materials they could be considering in the Development of their design proposals section of their NEA. Students must be aware as new designers, that Modern materials will continue to evolve as technology advances, as they are developed through the intervention of new or improved processes. Students will need to demonstrate their understanding of this topic in their Technical principles examination.	
12	3.1 Technical principles	Summer 5	32	**Enhancement of materials:** • Material enhancement • Polymer enhancement re-cap • Wood enhancement re-cap • Metal enhancement - Re-cap work hardening	

				Focused practical task: Hardening and tempering a piece of steel 3.1.3 Enhancement of materials - Polymer enhancement - Wood enhancement - Metal enhancement Students need to have developed a knowledge and understanding of enhancement methods for materials and their suitability for specific applications and be able to demonstrate this in their Development of design proposals NEA work that is running in parallel. Students will be familiar with Wood enhancement techniques but the remaining areas of study are likely to be new to them. Students will need to demonstrate their understanding of this topic in their Technical principles examination.	
12	3.1 Technical principles	Summer 6	33	**Forming, redistribution and addition processes:** • Paper and board forming processes • Die cutting and creasing • Bending • Laser cutting **Focused practical tasks:** 1) Die cut a piece of packaging and design 2) Design and make a package for laser cutting • Re-cap polymer processes 3.1.4 Forming, redistribution and addition processes - Paper and board forming processes Students need to have developed a wide range of knowledge and understanding of forming, redistribution and addition processes across all of the material areas. This is a vast topic that we have to chunk considerably to enable students to digest this information, and is therefore taught	NEA Section D- Development of design prototype(s) - Students will work with a range of appropriate materials/components to produce prototypes that are accurate and within close tolerances. This will involve using specialist tools and equipment, which may include hand tools, machines or CAM/CNC. The prototypes will be constructed through a range of techniques, which may involve shaping, fabrication, construction and assembly. The prototypes will have suitable finish with functional and aesthetic qualities, where appropriate. Students will be awarded marks for the quality of their prototype(s) and how it addresses the design brief and design specification based on a contextual challenge. In this section students will make the product that they designed in section C utilising skills that they have been

				over 9 weeks due to the fact students are also working on their NEA project. Students were already taught the section on Polymers in Autumn Term 1 so will only need to look over their work on that section. Students should be able to demonstrate their knowledge and understanding of the processes that are relevant to their project in their NEA, and must be able to articulate their knowledge effectively in their Technical Principles examination.	taught throughout the KS3, KS4 and KS5 curriculum. Students will then go onto section E where they will evaluate their product with their client to assess overall suitability of final product made.
12	3.1 Technical principles	Summer 6	34	**Forming, redistribution and addition processes:** • Metal processes • Forming processes: - Press forming - Spinning - Wrought iron forging - Bending - Rolling • Metal redistribution processes: - Sand casting - Die casting - Investment casting - Low temperature pewter casting **Focused practical task:** Pewter casting 3.1.4 Forming, redistribution and addition processes - Metal processes Students will have limited understanding of some of these processes form their studies at GCSE, and most will be completely new to them. Students need to be able to develop an understanding of all of the processes, as they will be tested on them in their Technical Principles examination. Students will also be applying this knowledge to their NEA work if it is relevant to their project.	
12	3.1 Technical principles	Summer 6	35	**Forming, redistribution and addition processes:** • Addition/fabrication processes	

				- MIG welding - TIG welding - Oxy-acetylene welding - Brazing **Watch demonstrations in heat treatment room.** - Soldering - Riveting - Pop riveting **Focused practical task:** Rivet and pop rivet metal. 3.1.4 Forming, redistribution and addition processes - Metal processes Students will have limited understanding of some of these processes form their studies at GCSE, and most will be completely new to them. Students need to be able to develop an understanding of all of the processes, as they will be tested on them in their Technical Principles examination. Students will also be applying this knowledge to their NEA work if it is relevant to their project.	
12	3.1 Technical principles	Summer 6	36	**Forming, redistribution and addition processes:** • Temporary fasteners and joining methods: - Self-tapping screws - Machine screws - Nut and bolt • Wasting processes: - Milling **Watch demonstration** - Turning **Watch demonstration** - Flame cutting - Plasma cutting - Laser cutting - Punching/stamping **Focused practical task:** Turn a length of aluminium. 3.1.4 Forming, redistribution and addition processes	

				- Metal processes Students will have limited understanding of some of these processes form their studies at GCSE, and most will be completely new to them. Students need to be able to develop an understanding of all of the processes, as they will be tested on them in their Technical Principles examination. Students will also be applying this knowledge to their NEA work if it is relevant to their project.	
12	3.1 Technical principles	Summer 6	37	**Forming, redistribution and addition processes:** • Wood processes: • Addition and fabrication processes • Traditional wood jointing: - Butt joint - Dowel joint - Mitre joint - Comb joint - Dovetail joint - Mortise and tenon joint - Housing joint - Half lap joint **Focused practical task:** Mark out and cut a variety of traditional wood joints 3.1.4 Forming, redistribution and addition processes - Wood processes Students should be more familiar with these processes form their studies at KS3 and GCSE. However, some will be completely new to them. Students need to be able to develop an understanding of all of the processes, as they will be tested on them in their Technical Principles examination. Students will also be applying this knowledge to their NEA work if it is relevant to their project.	
12	3.1 Technical principles	Summer 6	38	**Forming, redistribution and addition processes:** • Knock down fittings	

				- Modesty blocks - Barrel nut and bolt - Cam-lock connector • Wood screws, nuts and bolts and coach bolts **Focused practical task:** Practice using the fittings and fixings. 3.1.4 Forming, redistribution and addition processes - Wood processes Students should be more familiar with these processes form their studies at KS3 and GCSE. However, some will be completely new to them. Students need to be able to develop an understanding of all of the processes, as they will be tested on them in their Technical Principles examination. Students will also be applying this knowledge to their NEA work if it is relevant to their project.	
12	3.2 Designing & Making Principles	Summer 6	39	**Design theory (Part 2)** **Design styles and movements:** • Streamlining **Focused practical task:** Concept sketching 3.1.14 Design communication - 3D drawing - Isometric - One-point perspective - Two-Point Perspective - Thick/thin line technique - Mixed media and rendering **Assignment 3:** **Designers and their work** • Dieter Rams • Charles and Ray Eames • Marianne Brandt 3.2.2 Design theory - Design influences - Design styles and movements	

				- Designers and their work Students will be taught the final instalment of Design theory to complete their knowledge of design styles and designers and their work for their examination on Design and making principles. Students are taught this here to enable them time to complete this task over the Summer alongside their NEA task.	
13	3.1 Technical principles	Autumn 1	1	**Continuation of Forming, redistribution and addition processes:** • Wasting processes: - Turning - Routing timber - Milling timber • Forming processes: - Lamination - Steam bending 3.1.4 Forming, redistribution and addition processes - Wood processes Students should be more familiar with these processes form their studies at KS3 and GCSE. However, some will be completely new to them. Students need to be able to develop an understanding of all of the processes, as they will be tested on them in their Technical Principles examination. Students will also be applying this knowledge to their NEA work if it is relevant to their project.	Continuation of Section D NEA
13	3.1 Technical principles	Autumn 1	2	**Continuation of Forming, redistribution and addition processes:** • **The use of adhesives and fixings:** - Polyvinyl acetate - Contact adhesives - UV hardening adhesives - Solvent cement	

				3.1.4.5 The use of adhesives and fixings Students should be more familiar with the use of adhesives and fixings from their studies at KS3 and GCSE. However, some will be completely new to them. Students need to be able to develop an understanding of all adhesives and fixings as they will need to apply that knowledge when manufacturing their prototype and, as they will be tested on them in their Technical Principles examination.	
13	3.1 Technical principles	Autumn 1	3	**Continuation of Forming, redistribution and addition processes:** • **Jigs and fixtures:** • Sanding jigs • Router jigs 3.1.4.5 The use of adhesives and fixings Watch demonstration on how to create a finger joint using a router jig and compare to joint made last term by hand. Students should be more familiar with the use of jigs and fixtures from their studies at KS3 and GCSE. Students need to be able to develop an understanding of the use of jigs and fixtures as they will need to apply that knowledge when manufacturing their prototype and, as they will be tested on them in their Technical Principles examination.	
13	3.1 Technical principles	Autumn 1	4	**The use of finishes:** • Materials and their applications • Paper and board finishing: - Laminating - Embossing - Debossing - Foil blocking - Varnishing, UV varnishing and spot varnishing	

				• Paper and board printing processes: - Screen printing - Flexographic printing - Offset lithographic printing - Digital printing • Polymer finishing already covered. • Metal finishing: - Cellulose and acrylic paints - Electroplating - Dip coating - Powder coating - Varnishing - Sealants - Preservatives - Anodising - Cathodic protection • Wood finishing: - Polyurethane varnish Acrylic varnish - Water-based paints - Stains - Colour wash - Wax - Pressure treating - Yacht varnish - Danish oil - Teak oil **Focused practical task:** Test out a range of finishes. Label them and photograph. Dip coat a piece of metal and write up process with photographs. 3.1.5 The use of finishes - Paper and board finishing - Paper and board printing processes - Polymer finishing - Metal finishing - Wood finishing Students should be more familiar with the use of finishes from their studies at KS3 and GCSE. However, some will be completely new to them. Students need to be able to	

				develop an understanding of all the finishes on the specification as they will need to apply that knowledge when manufacturing their prototype and, as they will be tested on them in their Technical Principles examination.	
13	3.1 Technical principles	Autumn 1	5	**Modern and industrial scales of practice:** • Scales of production: - One-off, bespoke production - Batch production - Mass/line production - Unit production systems - Quick response manufacturing - Vertical in-house production • Efficient use of materials: - Materials cost, form, manufacturing processes and scale of production - Design and the economic use of materials - Manufacturing processes which increase accuracy and reduce waste - Comparing bulk and one-off production 3.1.6 Modern industrial and commercial practice - Scales of production 3.1.6.2 Efficient use of materials Students should be familiar with these topics from their studies from their basic understanding throughout KS3 and more detailed study at GCSE. Students need to be able to develop an understanding of modern and industrial scales of practice as they should be able to refer to it in their NEA and will be tested on them in their Technical Principles examination. This topic is taught over 2 weeks towards the end of Autumn Term 1.	
13	3.1 Technical principles	Autumn 1	6	**Modern and industrial scales of practice:** • The use of computer systems • Computer systems for planning	

				and control • Computer systems for manufacturing and production: - Modular/cell production - JiT manufacture - Quick response manufacturing - Flexible manufacturing systems - Computer systems for production, distribution and storage • Standardised and bought-in components: - Standardised components - Bought-in components - Changing standards • Sub-assembly 3.1.6 Modern industrial and commercial practice 3.1.6.2 Efficient use of materials - The use of computer systems - Sub-assembly	
13	3.1 Technical principles	Autumn 1	7	**Health and Safety:** • Safe working practices: - Training - Machine maintenance and guarding - Extraction systems - Provision of personal protective equipment - Accident reporting • Health and Safety at work Act (1974) • Control of Substances Hazardous to Health regulations • Health and safety in product manufacture • Safe working practices in the school or college workshop and in industry • Safety precautions • Risk assessment • Safety in product and services to the customer • Legislation to protect consumers - Consumer Protection Act 1987 • The Trade Descriptions Act 1968	

				• The British Standards Institute • The safety of toys 3.1.9 Health and safety - Safe working practices - Safety in products and services to the customer Students will possess sound knowledge of workshop health and safety procedures from their practical experience at KS4 and from their GCSE studies, but are likely to have limited knowledge of safety in industry or legislation. Students need to be able to develop an understanding of all topics under health and safety as they should be able to refer to it in their NEA and will be tested on it in their Technical Principles examination. This topic is taught at the end of Autumn Term 1.	
13	3.1 Technical principles	Autumn 2	Wk8	**Protecting designs and intellectual property:** • Intellectual property (IP) • Copyright and design rights • Patents • Registered designs • Trademarks and logos • Open design 3.1.10 Protecting designs and intellectual property Students must develop a knowledge and understanding of the importance of protecting designs and intellectual property as potential designers of the future. Students will be examined on this area in their Technical Principles examination.	Continuation of Section D NEA

13	3.1 Technical principles	Autumn 2	Wk9	**Feasibility studies:** • Computer modelling in production planning • Feasibility studies and costings • Feasibility modelling in design • Testing prototypes 3.1.12 Feasibility studies Students must develop a knowledge and understanding of the use of feasibility studies in the design process and in industrial contexts to assess practically for production of proposed designs, including the testing of prototypes with potential consumers. Students will be able to apply this knowledge to their NEA project and examined on this area in their Technical Principles examination.	
13	3.1 Technical principles	Autumn 2	Wk11	**Enterprise and marketing in the development of products:** • Customer identification • Corporate identity • Packaging design • Labelling • Global marketing • Advertising and promotion • Product costing, calculation and profit • Entrepreneurs and collaborative working with designers 3.1.13 Enterprise and marketing in the development of products Students must develop a knowledge and understanding of how designers work with entrepreneurs, and sales and marketing teams, and use research and customer information to develop products and packaging. Students will have a limited knowledge of this topic unless they studied Business at GCSE. Students will be examined on	

				this area in their Technical Principles examination.	
13			Wk12	**Mathematical skills for the written exams:** • Number and percentages • Material use and production costs • Volume • Tolerance • Ratios • Mixing constituent parts • Dividing sides The majority of students taking our subject study Maths or further Maths at A Level and therefore either already know or are able to pick up the Maths involved for their external exams very quickly. Students who are not familiar with the Maths skills required, have the time to focus on this and spend time with their teacher during tutorials, to fully understand each area, whilst the remainder of the class can work independently on this or studying for their Technical Principles and Designing and Making Principles exams.	
13			Wk13	**Mathematical skills for the written exams:** • Volumes of standard geometric forms • Combining forms • Comparing weights using density • Area and volume scale factors • Co-ordinates and geometry • Statistics and probability	
13			Wk14	All theory covered at this point. Students will complete additional exam practice questions and have revision sessions, from this point forwards, in preparation for their external exams.	

13			Wk15	Revision and preparation for Internal and external examinations.	
13		Spring 3	Wk16	Revision and preparation for Internal and external examinations.	NEA Section E-Analysing and Evaluating- Within this iterative design process students are expected to continuously analyse and evaluate their work, using their decisions to improve outcomes. This should include defining requirements, analysing the design brief and specifications along with the testing and evaluating of ideas produced during the generation and development stages. Their final prototype(s) will also undergo a range of tests on which the final evaluation will be formulated. This should include market testing and a detailed analysis of the prototype(s). Students will finish making the product that they designed in section E&D utilising skills that they have been taught throughout the KS3 & KS4 as well as the practical experiences of KS5. Students will then evaluate their product with their client and suggest further modifications which could be made to the product to improve its suitability. These skills taught in the NEA are all transferable to a wide range of HE and FE qualifications and general life skills, where students would need to utilise ICT facilities, problem solving, interpersonal skills, research gather and analysis, costing and budgeting and self-evaluation skills to realise a solution to a problem.
13		Spring 4		Revision and preparation for Internal and external examinations.	

In addition to end of unit assessment, students will frequently carry out knowledge check short tests in class and in class and at home, create summaries and key terms glossaries to embed terms and concepts into their long-term memory.

They will have frequent practice on exam type questions which range from multiple choice to 9 and 12 mark questions which test all of the assessment objectives.

Internal Assessments:

Students are assessed at the end of each unit. This assessment is in the format of past examination questions that are tracked for each student and collated to provide an ongoing summary of progress for each student

Final External Assessment:

Paper 1:

What's assessed

- Technical principles

How it's assessed

- Written exam: 2 hours and 30 Minutes
- 120 marks
- 30 % of A-Level

Questions

A mixture of short answer and extended response questions.

Paper 2:

What's assessed

- Designing and Making Principles

How it's assessed

- Written exam: 1 hours and 30 Minutes
- 80 marks
- 20 % of A-Level

Questions

A mixture of short answer and extended response questions.

Section A:

- Product Analysis: 30 marks
- Up to 6 short answer questions based on visual stimulus of product(s).

Section B:

- Commercial manufacture: 50 marks
- Mixture of short and extended response questions

NEA

What's assessed

- Practical application of technical principles, designing and making principles.

How it's assessed

- Substantial Design and make Final External Assessment:
- 100 marks
- 50% of A-Level

Substantial design and make task.

- Assessment criteria:
  - Identifying and investigating design possibilities
  - Producing a design brief and specification
  - Development of design proposals
  - Developing design Prototypes
  - Analysing & evaluating
- Students will produce a prototype and a portfolio of evidence
- Work will be marked by teachers and moderated by AQA

Further Curriculum Support

Text books & Revision Resources:

- AQA A-Level Design & Technology: Product Design, Will Potts, Julia Morrison, Ian Granger, Dave Sumpner, Hodder, ISBN 9781510414082
- My Revision Notes: AQA A Level Design and Technology: Product Design, Julia Morrison & Dave Sumpner, Hodder, ISBN 978-1510432291

https://www.technologystudent.com/

http://www.mr-dt.com/

British Plastics Federation: https://www.bpf.co.uk/plastipedia/Default.aspx

Enrichment activities:

Lunch time enrichment sessions available to all A-Level students 4 days a week.