Design & Technology

Design & Technology (D&T) is an area of study that focuses on planning, designing and creativity. The subject gives all students the opportunity to learn how to make things, repair products and discover solutions to different problems. This subject is one of the most progressive on the national curriculum, mainly due to the developments in technology and the rapidly changing world we live in. Technology is having an impact on the whole planet and we need to prepare our students for the developments they will encounter. Students in Design & Technology develop designing and making skills in addition to learning about electronics, computing, engineering, CAD, CAM, robotics, materials and textiles technology. They also develop business critical skills through problem-solving, innovation and team-work.

Throughout the Key Stage 3 course (Years 7 – 9), we aim to give all students a basic level of knowledge by helping them to be more creative, resilient, work independently, in groups and develop problem solving skills. These skills are transferable to other subjects and are all skills which will assist these children as they progress through the school and onwards.

In both Key Stages 3 and 4, students develop practical skills, creative skills and a knowledge of technology that will help prepare them for other academic subjects and their future. The course helps students to be more considerate of environmental impacts and the technological changes in the world they will encounter. Students are encouraged to work independently, develop problem solving skills and understand the process of design. The Key Stage 4 D&T course helps to develop some of the important skills, techniques and knowledge required for those students who intend to progress onto Key Stage 5. The course also develops the skills to lead into apprenticeships or specific college courses that focus on practical and creative skills.

Throughout Key Stages 3 and 4, we intend to deliver a wide curriculum giving students the chance to explore different areas of Design & Technology. The children develop and practise new skills and we aim to ensure that all students are confident in the following areas

- Help students to develop a variety of creative and practical skills through working with different techniques and materials
- Gain an understanding of designing, making and evaluating with a range of materials
- Develop technical knowledge in mechanical systems and properties of materials.
- Give students the opportunity to learn skills in cookery and be able to cook a range of predominantly savoury dishes.
- Develop an understanding of nutrition and health.
- Learn different techniques and skills in the kitchen.
- Understand about ingredients, their source, seasonality and the characteristics of the ingredients.
- Help to prepare students for an increasingly technical world.
- Gain awareness and understanding of the following factors
    - History of design
    - Social
    - Cultural
    - Environmental
    - Economic
- Further develop creative skills and techniques through, designing, making and evaluating.
- Prepare students to progress into apprenticeships or full-time career in creative and practical industries.
- Prepare students to progress into A Level course in product design.

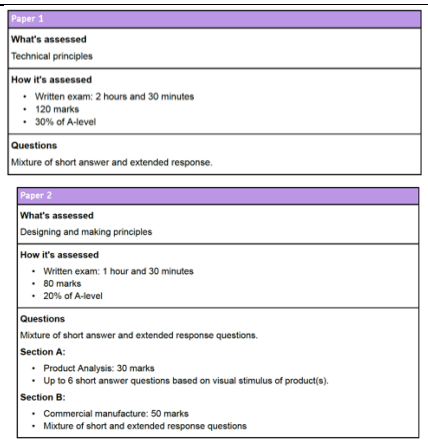
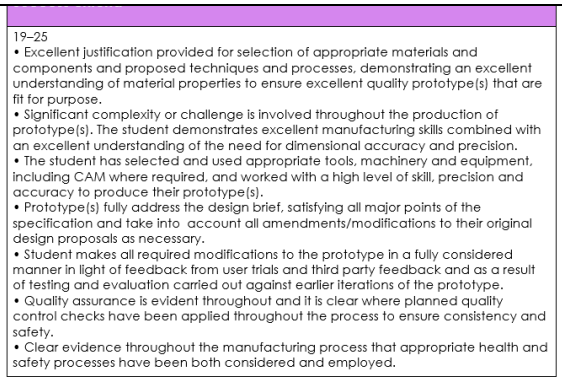
Teaching Design & Technology is very different to other subjects. It focuses on so many different skills. Those who find creative subjects difficult can still excel in Design & Technology through the construction, engineering, science and mathematical elements of the subject. Those who are creative can work more with designing and

manufacturing. The course develops students to work both with function and form and our aim as a department is to help students to develop skills in both of these areas.

Year 13 Design & Technology: Product Design

Term One

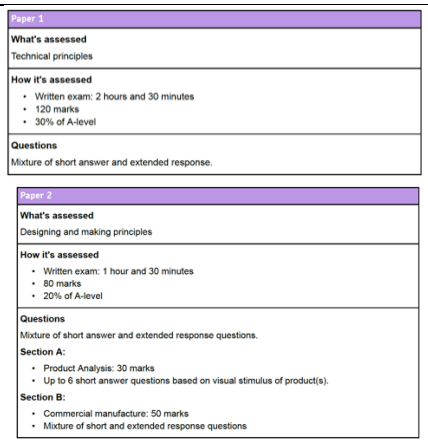
Content of study	*Designer influences and movements*	
What are the aims and objectives of this term?	Exam Theory Students will focus on designer influences this term. • Enterprise • Iterative design, research and product analysis • Designers and design movements • Development using designer influences • Trigonometry problems	NEA Students will be completing their practical outcome this term. They will mark out, cut components, complete any wood joints, plastics processes, metals processes and use CAD/CAM where applicable to make a high quality final outcome that meets their brief and specification from section B of the NEA.
What previous knowledge is required?	Prior knowledge of Design & Technology programmes of study at KS3 and KS4. Prior knowledge of using a range of tools and equipment relating to woods, metals, plastics, and fabrics would be useful. Students should have completed y12 Product Design.	
How will this term's content help with future learning?	Exam Theory Exam based questions on trigonometry, enterprise and designer influences. Students will be able to relate products to the era / designer involved. Students will be able to link designers with methods of manufacture and materials used.	Being able to answer exam questions on materials, processes, quality control, tolerances, CAD/CAM, finishes
Resources	Exam Theory www.technologystudent.com www.seymourpowell.com https://www.youtube.com/watch?v=Rnsk5lA52ps https://www.youtube.com/watch?v=6BD_WN2eWqM The Eames Creative Process – YouTube	www.technologystudent.com

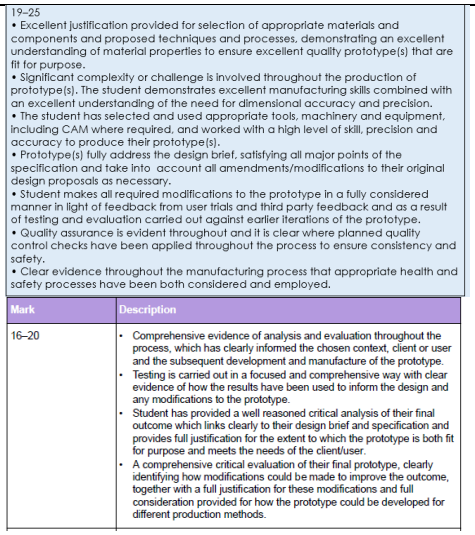
Links to the national curriculum/specification	 • Performance characteristics of materials • The use of adhesives and fixings • Enterprise and marketing in the development of products • Design methods and processes • Design theory • How technology and cultural changes can impact on the work of designers	 • Making a prototype • Completing a diary of manufacturing processes
Assessments	Exam Theory Students are given weekly homework - Product Design exam questions on various topics. Students complete a #ThinkDo card weekly. Students will complete a 1-hour exam in week 4.	Students are given weekly homework to complete their diary of manufacturing processes of the practical techniques they have used. Section C of NEA

Term Two		
Content of study	*NEA – practical section C*	
What are the aims and objectives of this term?	Exam Theory Students will focus on the role of the designer this term: • Product life cycles • Socio-economic issues • Developments in technology • Iterative design • Responsible designing • Conservation of energy • Critical analysis • BSi and other testing • Maths based questions	NEA Students will be continuing to complete their practical outcome this term. They will cut components, complete any wood joints, plastics processes, metals processes and use CAD/CAM where applicable to make a high quality final outcome that meets their brief and specification from section B of the NEA.

What previous knowledge is required?	Prior knowledge of Design & Technology programmes of study at KS3 and KS4. Prior knowledge of using a range of tools and equipment relating to woods, metals, plastics, and fabrics would be useful. Students should have completed y12 Product Design.	
How will this term's content help with future learning?	Exam Theory Exam based questions on the role of the designer and the issues that they have to consider when designing products. Exam based questions relating to product life cycles, energy conservation and product testing.	Being able to answer exam questions on materials, processes, quality control, tolerances, CAD/CAM, finishes
Resources	Exam Theory A-level textbook www.technologystudent.com	www.technologystudent.com
Links to the national curriculum/specification	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** Mixture of short answer and extended response. Paper 2 **What's assessed** Designing and making principles **How it's assessed** • Written exam: 1 hour and 30 minutes • 80 marks • 20% of A-level **Questions** 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 • Enterprise and marketing in the development of products • Design methods and processes • Design theory • How technology and cultural changes can impact on the work of designers	19–25 • Excellent justification provided for selection of appropriate materials and components and proposed techniques and processes, demonstrating an excellent understanding of material properties to ensure excellent quality prototype(s) that are fit for purpose. • Significant complexity or challenge is involved throughout the production of prototype(s). The student demonstrates excellent manufacturing skills combined with an excellent understanding of the need for dimensional accuracy and precision. • The student has selected and used appropriate tools, machinery and equipment, including CAM where required, and worked with a high level of skill, precision and accuracy to produce their prototype(s). • Prototype(s) fully address the design brief, satisfying all major points of the specification and take into account all amendments/modifications to their original design proposals as necessary. • Student makes all required modifications to the prototype in a fully considered manner in light of feedback from user trials and third party feedback and as a result of testing and evaluation carried out against earlier iterations of the prototype. • Quality assurance is evident throughout and it is clear where planned quality control checks have been applied throughout the process to ensure consistency and safety. • Clear evidence throughout the manufacturing process that appropriate health and safety processes have been both considered and employed. • Making a prototype • Completing a diary of manufacturing processes
Assessments	Exam Theory Students are given weekly homework - Product Design exam questions on various topics. Students complete a #ThinkDo card weekly. Students will complete a 1-hour exam in week 3.	Students are given weekly homework to complete their diary of manufacturing processes of the practical techniques they have used. Section C of NEA

<table>
<tr><th colspan="3">Term Three</th></tr>
<tr><td>Content of study</td><td colspan="2">NEA – evaluation and improvements</td></tr>
<tr><td>What are the aims and objectives of this term?</td><td>Exam Theory
Students will focus on accuracy in design & manufacture this term. This will include:
QA / QC
Product development
Safe working practices
Selection of manufacturing methods
Maths based exam questions</td><td>NEA
Students will show and analyse the evidence of CAD/CAM within their practical for section C.
They will begin to evaluate their final product and also make improvements to NEA work from section A and B.</td></tr>
<tr><td>What previous knowledge is required?</td><td colspan="2">Prior knowledge of Design & Technology programmes of study at KS3 and KS4. Prior knowledge of using a range of tools and equipment relating to woods, metals, plastics, and fabrics would be useful. Students should have completed y12 Product Design.</td></tr>
<tr><td>How will this term’s content help with future learning?</td><td>Exam Theory

Exam based questions on QA/QC and related testing in school / industry. Exam based questions relating to how products are developed, safe working practices in school and industry.</td><td>Being able to answer exam questions on materials, processes, quality control, tolerances, CAD/CAM, finishes and evaluation.</td></tr>
<tr><td>Resources</td><td>Exam Theory
A-level textbook
www.technologystudent.com</td><td>www.technologystudent.com
Students will also have access to exemplar NEA to see how to achieve top marks</td></tr>
<tr><td>Links to the national curriculum/specification</td><td> 

Health & safety
Accuracy in design & manufacture
The requirements for product design and development
Modern and industrial scales of practice</td><td> 

CAD/CAM
Evaluation</td></tr>
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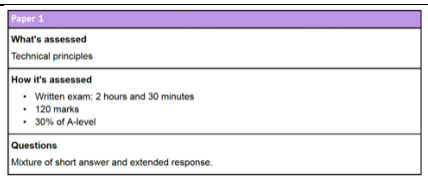
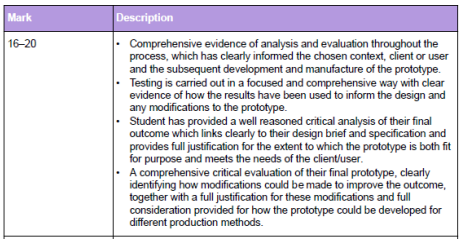
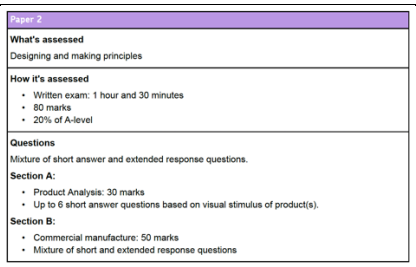
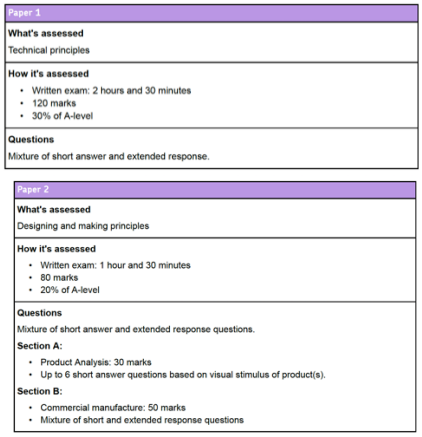
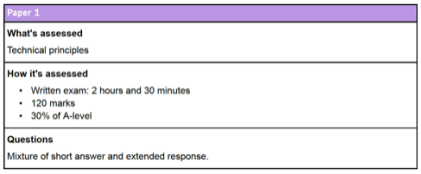
Assessments	Exam Theory Students are given weekly homework - Product Design exam questions on various topics. Students complete a #ThinkDo card weekly. Students will complete a 1-hour exam in week 4.	NEA work will be assessed using the grade criteria • Evidence of CAD/CAM • Evaluation against brief and specification • Evaluation ongoing modifications • Any improvements to NEA work

Term Four		
Content of study	*NEA – evaluation and improvements*	
What are the aims and objectives of this term?	Exam Theory Students will focus on accuracy in design & manufacture this term. This will include: • QA / QC • Product development • Safe working practices • Selection of manufacturing methods • Maths based exam questions	NEA Students will evaluate their final product • Evaluation with client • Evaluation of developments • Evaluation of manufacture • Evaluation testing • Critical analysis • Modifications • Alternative production
What previous knowledge is required?	Prior knowledge of Design & Technology programmes of study at KS3 and KS4. Prior knowledge of using a range of tools and equipment relating to woods, metals, plastics, and fabrics would be useful. Students should have completed y12 Product Design.	
How will this term's content help with future learning?	Exam Theory Exam based questions on QA/QC and related testing in school / industry. Exam based questions relating to how products are developed, safe working practices in school and industry.	Being able to answer exam questions on developments, client feedback, materials, processes, testing, scales of production and evaluation.
Resources	Exam Theory A-level textbook www.technologystudent.com	www.technologystudent.com Students will also have access to exemplar NEA to see how to achieve top marks
Links to the national curriculum/specification		 • *Evaluation*

	 Paper 2 **What's assessed** Designing and making principles **How it's assessed** • Written exam: 1 hour and 30 minutes • 80 marks • 20% of A-level **Questions** 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 • Health & safety • Accuracy in design & manufacture • The requirements for product design and development • Modern and industrial scales of practice	
Assessments	Exam Theory Students are given weekly homework - Product Design exam questions on various topics. Students complete a #ThinkDo card weekly. Students will complete a 1-hour exam in week 4.	NEA work will be assessed using the grade criteria • Evaluation with client • Evaluation of developments • Evaluation of manufacture • Evaluation testing • Critical analysis • Modifications • Alternative production

Term Five		
Content of study	*NEA – evaluation and improvements*	
What are the aims and objectives of this term?	Exam Theory Students will focus on Paper 2 topics this term: • Design theory • How technological and cultural changes can impact the work of designers • Responsible design • Maths based exam questions	Exam Theory Students will focus on Paper 1 prep and answer exam questions on this. They will also revise maths based questions and answer exam questions on this area.
What previous knowledge is required?	Prior knowledge of Design & Technology programmes of study at KS3 and KS4. Prior knowledge of using a range of tools and equipment relating to woods, metals, plastics, and fabrics would be useful. Students should have completed y12 Product Design.	
How will this term's content help with future learning?	Exam Theory Exam based questions on the above topics in Paper 2.	Exam Theory Exam based questions on the above topics in Paper 1.

Resources	Exam Theory A-level textbook www.technologystudent.com	Exam Theory A-level textbook www.technologystudent.com
Links to the national curriculum/specification	 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** Mixture of short answer and extended response. Paper 2 **What's assessed** Designing and making principles **How it's assessed** • Written exam: 1 hour and 30 minutes • 80 marks • 20% of A-level **Questions** 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 • Design theory • How technological and cultural changes can impact the work of designers • Responsible design • Accuracy in design & manufacture • The requirements for product design and development • Modern and industrial scales of practice	 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** Mixture of short answer and extended response.
Assessments	Exam Theory Students will complete individual revision of 5 areas of their PLC each week (3 weeks looking at Paper 1 topics and 3 weeks looking at Paper 2 topics). A 1hour exam will take place in week 3 – covering Paper 1 & 2 topics.	Exam questions