INTENT: Curriculum Overview (Year 13) A Level Design Technology – Product Design

A learner in Year 13 will know: how to take design risks, showing innovation and enterprise whilst considering their role as responsible designers and citizens. How to work collaboratively to develop and refine their ideas, responding to feedback from users, peers and expert practitioners How to think creatively, innovatively and critically through focused research and the exploration of design opportunities arising from the needs, wants and values of users and clients. How to become independent and critical thinkers who can adapt their technical knowledge and understanding to different design situations	A learner in Year 13 will be able to: make informed design decisions through an in-depth understanding of the management and development of taking a design through to a prototype/product. Create and analyse a design concept and use a range of skills and knowledge from other subject areas, including mathematics and science, to inform decisions in design and the application or development of technology Work safely and skilfully to produce high-quality prototypes/products Have a critical understanding of the wider influences on design and technology, including cultural, economic, environmental, historical and social factors.

A: 2g Product Design knowledge	B: NEA	C: Maths knowledge	D: Science knowledge	E: Topic/Theme	F: Topic/Theme

Term 1	1:1: NEA Maths knowledge	1:2: NEA Maths knowledge	Autumn % Assessment
	Knowledge: NEA - Initial Design Developments NEA - Further Design Developments NEA - Final design solution M7 – Anthropometrics and probability Skills: The use of CAD, CAM and image manipulation software is expected to support a learner's modelling, visualisation, development and refinement of their design solutions. This may include animation to show articulation and the analysis of structural features. It is expected that learners' final design solutions will be defined in sufficient detail for third party manufacture without further guidance, and presented using suitable CAD software to mirror standard practice in the product design industry, showing all relevant technical details using appropriate 2D (e.g. orthographic) and/or 3D (e.g. rendered drawings) formats together with parts lists to present a coherent and complete solution package. Graphic design artwork should be 'print-ready' using suitable DTP software to mirror standard practice in the graphic design industry, showing allowance for bleeds, crop/trim/fold marks, and appropriate colour references. A range of hand, machine and digital technologies including CAD/CAM are expected to be used as appropriate in learners' modelling, experimenting and prototyping.	Knowledge: NEA - Plan of making and risk assessment NEA - Manufacture of final prototype S1 - Use scientific laws – Newton's laws of motion, Hooke's law, Ohm's law as appropriate to the design product Skills: As part of their consideration of materials and components it is expected that learners will include consideration of appropriate bought-in and standardised parts for use within their design solutions. It is important for learners to consider evidence of the iterative developments, in particular with Product Design the demonstration of the performance of a product or prototype in use or in situ. Real-time evidence in the form of short video clips is likely to be the most effective way of demonstrating this within their chronological e-portfolio. Being in regular direct contact with stakeholders and users will deliver non-biased opinions. Learners are expected to objectively test the prototypes developed to meet the identified stakeholder requirements**.** Listening and observation are key skills for the learner in iterative testing and evaluation. Formative Assessment: Bi-weekly pit stop to assess understanding of knowledge covered. Pit 1 – 3 (10 marks)	Knowledge coverage: 2g. Product Design knowledge M1 to M6 – Maths knowledge Skills tested: In the written examinations, all learners are required to demonstrate their mathematical skills and scientific knowledge as applied to design and technology practice. The content of this component is focused towards products and applications and their analysis in respect of: • materials, components and their selection and uses in products/systems • industrial and commercial practices • wider issues affecting design decisions. Assessment style/questions: Sample 2 - paper 2 (Snow shovel theme) Critically examine the challenges that would be faced in providing a scheme of this nature. You will need to consider the different needs and requirements of wider stakeholders and users involved. Refer to information on page 2 of the Resource Booklet.

	Formative Assessment: Bi-weekly pit stop to assess understanding of knowledge covered. Pit 1 – 1 (10 marks) Pit 2 – 2 (10 marks) Pit 3 – M7 (10 marks) End point: The Iterative Design Project is a substantial design and make project that is individual to each learner and follows the methodology of iterative designing. Learners will be required to explore contexts of their own choosing that are both contemporary and challenging. The focus should be on identifying problems and opportunities to be resolved in an innovative way within the endorsed title they are working in. The undertaking of their project should demonstrate their self-management and a clear and thorough understanding of iterative design processes in practice. Learners will need to demonstrate their knowledge, understanding and skills through overlapping, repeated iterative processes that: • 'explore' needs • 'create' solutions that demonstrate how the needs can be met, and • 'evaluate' how well the needs have been met.	Pit 2 – 4 (10 marks) Pit 3 – S1 (10 marks) End point: The Iterative Design Project is a substantial design and make project that is individual to each learner and follows the methodology of iterative designing. Learners will be required to explore contexts of their own choosing that are both contemporary and challenging. The focus should be on identifying problems and opportunities to be resolved in an innovative way within the endorsed title they are working in. The undertaking of their project should demonstrate their self-management and a clear and thorough understanding of iterative design processes in practice. Learners will need to demonstrate their knowledge, understanding and skills through overlapping, repeated iterative processes that: • 'explore' needs • 'create' solutions that demonstrate how the needs can be met, and • 'evaluate' how well the needs have been met.	Compare and contrast the properties of both products with reference to their functional suitability for undertaking the task of clearing snow. In your response you must consider the following aspects of each product: • materials; • construction; • maintenance. Calculate the total cost of delivery to 1000 homes. In your calculations you should use the data provided on pages 3 and 4 of the Resource Booklet. Key requirements: • avoid mixing types of shovel in the same carton; • fill each carton as economically as possible; • aim to include as close as possible to, and no less than, 20% wheeled snow shovels; • avoid stacking cartons to allow delivery operatives ease of access to the top of the cartons.
Term 2	2:1 NEA Science knowledge	2:2: 2g Product Design knowledge Science knowledge	Spring % Assessment
	Knowledge: NEA - Manufacture of final prototype NEA - Analysis against specification & marketing/advertising plan NEA - Lifecycle analysis, testing NEA - Improvements and modifications, SWOT analysis S2 - Describe the conditions which cause degradation Skills: It is important for learners to consider evidence of the iterative developments, in particular with Product Design the demonstration of the performance of a product or prototype in use or in situ. Real-time evidence in the form of short video clips is likely to be the most effective way of demonstrating this within their chronological e-portfolio. Being in regular direct contact with stakeholders and users will deliver non-biased opinions. Learners are expected to objectively	Knowledge: 1 - Identifying requirements revision 2 - Learning from existing products revision 3 - Implications of wider issues revision 4 - Design thinking and communication revision 5 - Materials and component considerations revision 6 - Technical understanding revision S3 - Know the physical properties of materials and explain how these are related to their uses Skills: Analysing modern consumer products that are designed to meet identified consumer needs, their design and manufacture. To be familiar with a range of materials and components used in the manufacture of commonly available products, and be able to make critical comparisons between them.	Knowledge coverage: 2g. Product Design knowledge M1 to M6 – Maths knowledge S1 to S3 – Science knowledge Skills tested: In the written examinations, all learners are required to demonstrate their mathematical skills and scientific knowledge as applied to design and technology practice. The content of this component is focused towards products and applications and their analysis in respect of: • materials, components and their selection and uses in products/systems • industrial and commercial practices

	test the prototypes developed to meet the identified stakeholder requirements**.** Listening and observation are key skills for the learner in iterative testing and evaluation. Formative Assessment: Bi-weekly pit stop to assess understanding of knowledge covered. Pit 1 – 5 (10 marks) Pit 2 – 6 (10 marks) Pit 3 – S2 (10 marks) End point: The Iterative Design Project is a substantial design and make project that is individual to each learner and follows the methodology of iterative designing. Learners will be required to explore contexts of their own choosing that are both contemporary and challenging. The focus should be on identifying problems and opportunities to be resolved in an innovative way within the endorsed title they are working in. The undertaking of their project should demonstrate their self-management and a clear and thorough understanding of iterative design processes in practice. Learners will need to demonstrate their knowledge, understanding and skills through overlapping, repeated iterative processes that: • 'explore' needs • 'create' solutions that demonstrate how the needs can be met, and • 'evaluate' how well the needs have been met.	To have a framework for analysing existing products that enables them to make considered selections of appropriate materials and manufacturing processes when designing. Formative Assessment: Bi-weekly pit stop to assess understanding of knowledge covered. Pit 1 – 7 (10 marks) Pit 2 – 8 (10 marks) Pit 3 – S3 (10 marks) End point: Students will be able to consider products, applications and their analysis in respect of: • materials, components and their selection and uses in products/systems • industrial and commercial practices • wider issues affecting design decisions.	• wider issues affecting design decisions. Assessment style/questions: June 2019 – paper 2 (To add when paper published electronically)
Term 3	3:1: 2g Product Design knowledge Maths knowledge Science knowledge	3:2: 2g Product Design knowledge Maths knowledge Science knowledge	Summer % Assessment
	Knowledge: 7 - Manufacturing processes and techniques revision 8 - Viability of design solutions revision 9 - Health & safety revision Paper 1 preparation Paper 2 preparation Skills: Analysing modern consumer products that are designed to meet identified consumer needs, their design and manufacture.	Knowledge: Paper 1 preparation Paper 2 preparation Skills: Analysing modern consumer products that are designed to meet identified consumer needs, their design and manufacture. To be familiar with a range of materials and components used in the manufacture of commonly available products, and be able to make critical comparisons between them.	Knowledge coverage: 2g. Product Design knowledge M1 to M6 – Maths knowledge S1 to S3 – Science knowledge Skills tested: In the written examinations, all learners are required to demonstrate their mathematical skills and scientific knowledge as applied to design and technology practice. The content of this component is focused towards products and applications and their analysis in

	To be familiar with a range of materials and components used in the manufacture of commonly available products, and be able to make critical comparisons between them. To have a framework for analysing existing products that enables them to make considered selections of appropriate materials and manufacturing processes when designing. Formative Assessment: Bi-weekly pit stop to assess understanding of knowledge covered. Pit 1 – 9 (10 marks) Pit 2 – Exam command words (10 marks) Pit 3 – (10 marks) End point: Students will be able to consider products, applications and their analysis in respect of: • materials, components and their selection and uses in products/systems • industrial and commercial practices • wider issues affecting design decisions.	To have a framework for analysing existing products that enables them to make considered selections of appropriate materials and manufacturing processes when designing. Formative Assessment: N/A End point: Students will be able to consider products, applications and their analysis in respect of: • materials, components and their selection and uses in products/systems • industrial and commercial practices • wider issues affecting design decisions.	respect of: • materials, components and their selection and uses in products/systems • industrial and commercial practices • wider issues affecting design decisions. Assessment style/questions: Real A-Level exams – paper 1 and 2