



## PLUME ACADEMY - LEARNING OVERVIEW

Year	12
Course	Product Design
Specification Number/Exam Board	7552-AQA
Examination Papers and Weighting	50% Non-Examined Assessment – 50% Exam

### Prior Learning

The Year 12 Product Design curriculum builds on prior learning by continuing to offer students the opportunity to build their designing and manufacturing skills.

### Curriculum Intent – What are the curriculum aims?

Teaching and learning is based on five sessions per week. The three components that make up the A-level qualification, Paper 1, Paper 2 and the non-exam assessment (NEA), should be allocated appropriate teaching sessions to reflect their weighting allocations: 50% NEA, 50% written exams. This scheme of work is structured to enable teachers to focus on content that will prepare students for assessment at the end of year 2.

Students should be expected to develop the following skills - Research and investigation into target user, existing products, materials, manufacturing methods, joining methods, design movements, iterative design processes, development of designs, manufacturing and modelling methods, review and evaluation skills.

### Curriculum Implementation – What will my child will be learning?

Term 1	Half Term 1	<p>Theory - Technical Principles</p> <p>Unit 1 – Communication Methods</p> <p>Students are re-introduced to the classification of different materials types and how they are sorted.</p> <p>Communication skills are explored and developed to allow students to present design concepts effectively in a range of formats. Students learn of the techniques to be employed and the correct use of different styles.</p> <p>Unit 4 – Timber Based Materials</p> <p>Students explore elements effecting the selection and use of timber-based materials. Methods of working with and refining and finishing timbers effectively are explored.</p> <p>Focused practical tasks using timbers</p> <p>Technical drawing Practice</p>
	Half Term 2	<p>Theory - Technical principles,</p> <p>Unit 5 – Metals</p> <p>Students learn specific information about a broad selection of ferrous, non-ferrous and alloyed metals and looks at the at the stock forms in which they are likely to be available before moving on to look at the performance characteristics of metals. The enhancement of metals through heat treatment as well as how the testing of different metal properties is conducted.</p> <p>Unit 9 – Use of computer Systems</p> <p>Students learn specific information on a range of uses for computers in the product design world. The unit examines the use of computer systems, communication data, digital design and modelling processes. The unit explores computer integrated manufacturing and other time and resource saving measures. Digital design and manufacture, where</p>

		<p>computer aided design and manufacture through CNC is analysed and compared to tradition methods. Students also learn about the use of computers to assist with modelling, testing, marketing and scheduling, and investigates how specialist software can help to integrate procedures making manufacturing increasingly efficient.</p> <p>Pewter Casting J2Opener</p>
Term 2	Half Term 3	<p>Theory - Technical Principles, Unit 3 – Polymer Based Materials</p> <p>Students learn about the many varied and contrasting types of polymers. They are explained and classified in this in-depth unit. The standard range of commonly used plastic are included along with the lesser known elastomers and biodegradable polymers that are more frequently being used, both in schools and in industry. A plethora of stock forms, characteristics and properties are discussed in a format that makes it easy for students to both recall and apply the performance of polymers in use. The unit investigates the processes involved in manipulating a multitude of different plastics in a variety of stock forms.</p> <p>Desk tidy</p>
	Half Term 4	<p>Theory - Technical Principles, Unit 2 – Papers &amp; Boards</p> <p>Students explore the fundamentals of paper and board production, this unit gives detailed information covering a broad range of paper and board stock. It enables students to discern between similar stock forms and make decisions about their specific properties, characteristics, uses and methods of manipulation. It covers the recycling of paper and board products and the environmental impact of their use. The unit also covers the main ways to manipulate paper and board to produce the types of products produced in industry. The processes covered include many hand, machine and digital techniques. The use of industry standard printing and finishing methods is specifically highlighted, in addition to many forming and bonding techniques, of which many can be modelled in school.</p> <p>Unit 6 – Composites, Smart &amp; Modern Materials</p> <p>Students learn about the fascinating range of other materials types available to designers. The unit which starts by explaining a broad selection of composite materials and the applications they are specifically designed for. The unit moves on to discover the interesting world of smart and modern materials, incorporating many material areas.</p>
Term 3	Half Term 5	<p>Theory - Technical Principles, Designing &amp; Making Principles Unit 7 – Product development &amp; Improvement</p> <p>Students explore the use of alternative design strategies and the understanding of how to gather and use research data. Design history and theory is delivered through case study investigation of design movements, influential design houses and world class designers. The unit leads students to draw conclusions about how design has shaped our modern world and how designers need to work responsibly to reduce negative global impact. The methodology for tackling this reduction concludes the lessons by unpicking a product’s lifecycle and the choices that this analysis presents a designer</p> <p>Unit 8 – Good Working Practice</p> <p>This unit explores the use of modern industrial and commercial practices and the requirements that manufacturers have for product development. Students examine the purpose of ‘design for maintenance, repair and disposal and the role these processes have in the safeguarding of resources. The unit also examines how enterprise and marketing are used in the development of a product. Students will gain knowledge on the importance of selecting the appropriate tools, equipment and materials for specific jobs. Students are taught how designers are responsible for ensuring accuracy in designs, how to achieve this and how to manage a project.</p>

	Half Term 6	NEA – Students start the process of identifying a topic for the focus of their NEA project. A series of strategies are employed in the exploration of possibilities. Students engage in research and analysis to address many parts of Section A: Identify and investigate design possibilities. Students then compose a comprehensive design brief and Design specification that will guide them through the design stages of the NEA project, covering Section B: Producing a design brief and specification
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### Curriculum Impact – How will my child be assessed and receive feedback?

**Paper 1** – Technical principles - Written exam: 2 hours and 30 minutes  
120 marks – 30% of A-level

Mixture of short answer and extended response.

**Paper 2** - Designing and making principles - Written exam: 1 hour and 30 minutes  
80 marks - 20% of A-level

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

% worth of question in relation to paper as a whole: 50%

#### **NEA Yr 12**

NEA Practical application of technical principles, designing and making principles.  
Substantial design and make project.

100 marks.

Assessment Objectives (and weighting): 50% of A level

4.5.1 Section A: Identify and investigate design possibilities (20 marks)

4.5.2 Section B: Producing a design brief and specification (10 marks)

4.5.3 Section C: Development of design proposal- (25 marks)

4.5.4 Section D: Development of design prototypes (25 marks)

4.5.5 Section E: Analysing and evaluating (20 marks)

### Super-Curricular Opportunities – Supporting and Extending Learning

Useful study resources	If a student is really passionate about this subject they can...
Technology Student - <a href="http://www.technologystudent.com/">http://www.technologystudent.com/</a> BBC Bitesize - <a href="https://www.bbc.co.uk/bitesize/subjects/zvg4d2p">https://www.bbc.co.uk/bitesize/subjects/zvg4d2p</a> Seneca - <a href="https://www.senecalearning.com/">https://www.senecalearning.com/</a> Number Phile - <a href="https://www.numberphile.com/">https://www.numberphile.com/</a> Engineer Guy - <a href="https://www.youtube.com/user/engineerguyvideo">https://www.youtube.com/user/engineerguyvideo</a> Fusion 360 - <a href="https://www.youtube.com/user/AutodeskFusion360">https://www.youtube.com/user/AutodeskFusion360</a>	<ul style="list-style-type: none"><li>• Topic – Non-Destructive Testing – <a href="http://www.trainingndt.com">www.trainingndt.com</a></li><li>• Topic – Articles on Materials – <a href="http://www.azom.com">www.azom.com</a></li><li>• Topic – Starch Based Products – <a href="http://www.earthpac.co.nz/Earthpac">www.earthpac.co.nz/Earthpac</a></li><li>• Topic – Toxicity Of Woods – <a href="http://www.hse">www.hse</a></li><li>• Topic – The British Plastic Federation – Plastipedia – <a href="http://www.bpf.com">www.bpf.com</a></li><li>• Topic – Institute of Materials, Minerals &amp; Mining – <a href="http://www.iom3.org">www.iom3.org</a></li><li>• Topic – How Forces Make Things Stick – <a href="http://www.explainthatstuff.com/adhesives.html">www.explainthatstuff.com/adhesives.html</a></li></ul>

