



PLUME ACADEMY - LEARNING OVERVIEW

Year	10
Course	Design & Technology – Resistant Materials
Specification Number/Exam Board	8552 AQA
End of course assessment and weightings	50% NEA 50% Exam

Prior Learning

The subject builds on your child's Key Stage 3 experience in Resistant Materials by Learners would have covered a range of skills during KS3 exploring a range of skills such as Researching, Planning, Designing, Manufacturing and Evaluative skills. These skills would have resulted in the production of a finished product.

Curriculum Intent – What are the curriculum aims?

GCSE Design and Technology 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. Design & Technology (Resistant Materials) allows students to study core technical and designing and making principles, including a broad range of design processes, materials techniques and equipment. They will also have the opportunity to study specialist technical principles in greater depth.

Curriculum Implementation – What will my child be learning?

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 10	Wood Workers Box					NEA
	Drawing Skills	Hand Tool Skills	3D Printed Hinges	Laser Cut Box Insert	Cast ID Plate	
	Theory					
	Materials	Timbers, Metals & Polymers	Designer flash cards	Energy, materials, systems and devices	Common Specialist technical principles	



Term 1	Half Term 1 Practical	Woodworkers Box: Drawing Skills, wood joining methods, hand skills, understanding of working drawings, manufacturing experience, understanding and knowledge.
	Half Term 1 Theory	Materials: The materials are covered through practical applications and with reference to the key material category in which they belong. The specific physical and working properties that best describe each material subcategory are identified and defined with reference to use and knowledge that will underpin practical designing and making activities.
	Half Term 2 Practical	Woodworkers Box: Drawing Skills, wood joining methods, hand skills, understanding of working drawings, manufacturing experience, understanding and knowledge.
	Half Term 2 Theory	Woods, Metals and Polymers: The processes involved in sourcing, converting and seasoning timber are covered in the first topic. This also covers sustainability and ethical issues, as well as the comparative advantages of manufactured boards and natural wood. The second lesson focuses on commercial stock forms, fittings and school based processing methods. Commercial processing techniques, surface treatments and finishes are covered in the final topic within the contexts of flat-pack furniture and wooden toys. Quality control techniques using go / no go gauges to check tolerances are also covered
Term 2	Half Term 3 Practical	3D Printed Hinges: Throughout this project, students will explore manipulation of materials. Students will aim to develop their use of CAD CAM. Students will explore 3D prototyping with the use of fusion 360, slicing software and 3D printing to manufacture a functioning product. It is expected that learners will understand how to prototype a working product to a high level.
	Half Term 3 Theory	Designers flash cards: Students explore the range of 28 designers required to be studied by the course. Their influence on the design community will be studied as will the impact of eight iconic design companies. The students compile a set of revision Key cards as part of their learning.
	Half Term 4 Practical	Laser cut box insert: Throughout this project students will explore manipulation of materials such as plastics and woods. Students will aim to utilise the use of acrylic as well as CAD CAM skills in the creation of a prototype. different abilities will promote the creation of various different products in response to the context of creating a box insert. It is expected that learners will understand how to prototype a working product to a high level. Modelling forms a fundamental part of this prototyping. these skills are imperative to the iterative design stage that learners will undertake during their NEA.
	Half Term 4 Theory	Energy, materials, systems and devices: Energy generation from finite and non-finite sources is argued in the initial lesson before looking at energy storage in the second lesson. Developments in modern and smart materials, and their properties are covered in the following two lessons. The unit progresses to cover composite materials and technical textiles including GRP, CRP and Kevlar. Electronic systems and mechanical devices are covered in the final lessons.
Term 3	Half Term 5 Practical	Cast ID Plate: Throughout this project, students will explore the manipulation of metals. Students will investigate different metals along with shaping and forming methods such as the different casting methods, cutting and drilling. Some of these they will gain practical experience through the realising of their design. Students will be utilise and further embedding the use of CAD CAM developed in their desk tidy project when creating pewter casting mould. This project is a design and make project. This will require the students to research, design, develop designs, realise design and evaluate. It is expected that the students will have a high quality cast pewter prototype.
	Half Term 5 Theory	Common specialist technical principles: This unit focuses on the specialist technical principles that are common to all material areas in Section 3.2 of the 8552 specification. The suite of topics begins by covering the various forces and stresses on materials and objects with detailed exemplification, before looking at how to enhance them to improve their functionality. Ecological issues including product mileage and the six Rs are covered in detail across two lessons. The final lesson covers the effect of scale in production and production methods.
	Half Term 6	NEA – 1 ST June AO1 Section A: Identify and investigate design possibilities



Curriculum Impact – How will progress be assessed as I learn?

Students will be assessed with termly tests at the end of a unit of theory work. Feedback will be given on the student's work using Close the Gap comments as well as feedback from their tests. Students will prepare themselves for their NEA project which starts in June. Students must have sufficient direct supervision for the written element to ensure that the work submitted can be confidently authenticated as their own.

Super-Curricular Opportunities – Support and Extending Learning

Useful study resources	If a student is really passionate about this subject...	As a parent/carer, I can assist my child in this subject by:
<p>Technology Student - http://www.technologystudent.com/</p> <p>BBC Bitesize - https://www.bbc.co.uk/bitesize/subjects</p> <p>Seneca - https://www.senecalearning.com/</p> <p>Number Phile - https://www.numberphile.com/</p> <p>Fusion 360 - https://www.youtube.com/user/AutodeskFusion360</p> <p>Google Sketch up – https://www.sketchup.com/products/sketchup-for-web</p>	<p>Watch an episode of The Gadget Show https://www.channel5.com/show/the-gadget-show/</p> <p>Enter the Design Ventura Competition https://ventura.designmuseum.org/</p> <p>Design a display for a notable product or designer of interest.</p> <p>Visit the Olympic Stadium in Stratford and find out about its construction.</p> <p>Listen to the femmes of STEM podcast.</p>	<p><i>Topic – Toxicity Of Woods – www.hse.com</i></p> <p><i>Topic – The British Plastic Federation – Plastipedia – www.bpf.com</i></p> <p><i>Topic – Institute of Materials, Minerals & Mining – www.iom3.org</i></p> <p><i>Topic – How Forces Make Things Stick – www.explainthatstuff.com/adhesives.html</i></p>