

Year: 13

Subject: A Level Design and Technology: Product Design

Autumn Term		
Overarching Topic:		
What has come before and what comes later:	From May 1 <sup>st</sup> of year 12, students started their NEA with a weighting of 50%. Prior to this, students completed a mock NEA project whilst building knowledge of materials and the work of others.	
	Core	Extension
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	<ul style="list-style-type: none"> <li>Why is a specification so important to a designer/user?</li> <li>What would you expect to see in a product specification and why?</li> <li>What is the purpose of making prototypes?</li> <li>What methods of prototyping are there and which is best? You must explain your answer</li> <li>What materials might you use and why?</li> <li>What alternate materials could be used and why?</li> <li>Why is it important to regularly check developmental work against the specification?</li> <li>Why is it important to know your client/user's needs? How can you find out their needs?</li> <li>What problems have you encountered and how have you solved them? (This question should be able to be answered multiple times throughout development stages)</li> <li>How has your product developed in light of prototyping? (This question should be able to be answered multiple times throughout development stages)</li> <li>How can prototypes be tested?</li> <li>What specific processes have you used in the development of your prototype and why? (This question should be able to be answered multiple times throughout development stages)</li> <li>Explain why a 3<sup>rd</sup> angle orthographic projection is so important to manufacturers and what would the drawing show?</li> <li>What is the environmental impact of your product?</li> <li>What is the difference between a patent and a copyright?</li> <li>How has mathematics supported in the design and development of your product?</li> <li>How have mechanisms been used in your projects (state what mechanisms have been used). – This will not apply to every students.</li> </ul>	<ul style="list-style-type: none"> <li>What are the advantages/disadvantages of virtual modelling?</li> <li>Outline the advantages of buying materials in standard form.</li> <li>Explain why dimensioning on a 3<sup>rd</sup> angle orthographic projection should conform to British standards. In order for the drawing to conform to British standards what would you expect to see?</li> </ul>

**Year: 13**

**Subject: A Level Design and Technology: Product Design**

	Skill/Technique	How students will develop and demonstrate this
Key skills	<ul style="list-style-type: none"> <li>• NEA – Research</li> <li>• NEA - Specification</li> <li>• NEA - Design- development- analyse and evaluate.</li> <li>• NEA - Prototyping - analyse and evaluate</li> </ul>	<ul style="list-style-type: none"> <li>• NEA design portfolio</li> </ul>

Spring Term		
Overarching Topic:		
What has come before and what comes later:	Students have developed their final proposal through various design iterations. Research/brief/specification/design/develop/modelling/final solutions.	
	Core	Extension
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	<ul style="list-style-type: none"> <li>• Why have you chosen that specific materials for manufacture?</li> <li>• What alternate materials could have been used and why?</li> <li>• Why have you chosen that specific method of manufacture?</li> <li>• Explain how you have used tools specifically to your project skilfully.</li> <li>• Explain how you have ensured safety throughout the manufacture of your product.</li> <li>• What alternate methods of manufacture could have been used?</li> <li>• Why are finishes applied to materials?</li> <li>• What specific finishes will be applied to your product and why?</li> <li>• How have you considered safety in when choosing and applying your finish?</li> <li>• How has CAD/CAM improved the design and development of new products?</li> <li>• Explain how to be safe when using a belt sander.</li> </ul>	<ul style="list-style-type: none"> <li>• How would your material/manufacturing decisions change have based on progress so far?</li> <li>• How would you adapt your product to allow commercial manufacture?</li> <li>• Evaluate the use of CAD/CAM when designing and developing new products.</li> </ul>

Year: 13

Subject: A Level Design and Technology: Product Design

	<ul style="list-style-type: none"> <li>• Explain how to be safe when using a pillar drill.</li> <li>• Explain the importance for manufacturers having a 3<sup>rd</sup> angle orthographic drawing to work from.</li> <li>• How has your product changed from your final design and why?</li> <li>• What is the next stage of manufacture?</li> <li>• How do you know your product is fit for purpose?</li> <li>• How does your product impact on the environment?</li> <li>• How could you reduce its impact?</li> <li>•</li> <li>•</li> </ul>	
	Skill/Technique	How students will develop and demonstrate this
Key skills	Share manufacturing skills NEA - Manufacture – diary NEA - Manufacture - diary - testing NEA – life cycle assessment	<ul style="list-style-type: none"> <li>• NEA design portfolio/manufactured product</li> </ul>

Year: 13

Subject: A Level Design and Technology: Product Design

Summer Term		
Overarching Topic:		
What has come before and what comes later:	Students have completed their NEA 50% of the GCSE grade. Students must now refresh and review prior learning in preparation for final examination – remaining 50%.	
	Core	Extension
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	<ul style="list-style-type: none"> <li>• Explain how a tree is made into a workable timber.</li> <li>• What are the advantages and disadvantages of kiln seasoning over natural?</li> <li>• Explain why Beech is the best suited material for children's toys?</li> <li>• What advantages do softwoods have over hardwoods?</li> <li>• What advantages do hardwoods have over softwoods?</li> <li>• What are the advantages of buying materials in stock form? Use examples in your answer</li> <li>• What is the FSC and why should we purchase FSC approved materials?</li> <li>• Why is recycling the worst of the 6Rs?</li> <li>• What can be done in home to reduce our carbon footprint?</li> <li>• What can be done in industry to reduce its carbon footprint?</li> <li>• When batch producing products, why use jigs?</li> <li>• Why do we need mechanisms?</li> <li>• What would a gear ratio of 1:2 tell you?</li> <li>• What would a gear ratio of 3:1 tell you?</li> <li>• How do you work out a percentage?</li> <li>• When would you apply Pythagoras instead or trigonometry?</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• What is the ecological impact of obsolescence?</li> <li>• What technological developments have led to the miniaturisation of products?</li> <li>• What is the impact of deforestation?</li> </ul>
	Skill/Technique	How students will develop and demonstrate this

**Year: 13**

**Subject: A Level Design and Technology: Product Design**

Key skills	<ul style="list-style-type: none"><li>• Understand how to answer state, outline, describe, explain, analyse and evaluate questions.</li><li>• Skill of selecting the most easily developed reason</li><li>• Exam prep - Sample papers – Exam technique</li></ul>	<ul style="list-style-type: none"><li>• Examination style questions/Answers</li></ul>
------------	--	---