

AS Technology & Design Unit 2 Amplification

General

- The emphasis of this unit is on the analysis and development of an **existing** product, with a view to re-designing either the product or an aspect of it. It is the responsibility of the teacher to ensure the choice of product allows sufficient scope for development and challenge at AS Level.
- Candidates will produce a 3-dimensional model or prototype which represents the practical outcome of the product analysis and development.
- A portfolio should accompany the practical component with written and graphical information produced on not more than 10 A3 sheets. Candidates can present the portfolio in electronic format.
- This unit draws on the knowledge and skills covered in Unit 1 and should represent approximately 45 hours of work. It will be internally assessed and externally moderated.

Additional guidance to staff.

It is the responsibility of the teacher, alongside the candidate to ensure that the choice of **product** is suitable for development and provides sufficient scope to enable the candidate to obtain top band marks in each section. Teachers should ensure that candidates present work within the stated 10 page limit.

This Unit starts with a focus on a **PRODUCT** suitable for redevelopment.

Well annotated Candidate Record Sheets can assist in the endorsement of marks.

High (14–20)

- Present a wide range of existing similar products in detail.
- Give a detailed description of function, purpose and features.
- Consider in detail relevant materials and industrial production methods.
- Present a detailed evaluation of fitness for purpose.
- Present high level analysis of ergonomics and aesthetic suitability.

Medium (Level 7–13 marks)

- Present a suitable range of existing similar products in moderate detail.
- Give some description of function, purpose and features.
- Consider aspects relevant to materials and industrial production methods.
- Present a reasonable evaluation of fitness for purpose.
- Present reasonable analysis of ergonomics and aesthetic suitability.

Low (Level 1–6 marks)

- Present only a basic range or list of existing similar products.
- Give limited description of function, purpose and features.
- Consider a limited range of materials and industrial production methods.
- Present a vague evaluation of fitness for purpose.
- Present limited analysis of ergonomics and aesthetic suitability.

Investigation and analysis of product

High (14–20)

- Present a wide range of existing similar products in detail.
 - *4 or 5 similar products would be considered a wide range*
 - *Similar products are considered to be products which fulfil the same purpose.*
- Give a detailed description of function, purpose and features.
 - *Purpose is what a product is designed to do.*
 - *Function is how the product fulfils its purpose.*
 - *A feature is a prominent characteristic of the product.*
- Consider in detail relevant materials and industrial production methods.
 - *This should be factual and should reflect the knowledge and skills based content from AS Unit 1 Core.*
 - *Candidates must ensure that the information presented is specifically related to the key aspects of the products being analysed (not circuit).*
 - *No credit can be awarded for presenting information about manufacturing processes in general. All work within this section must be specifically related to the analysis of the product. Eg No credit awarded for the presentation of images of injection moulding*

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<p>Zero should be awarded for a response which is not worthy of any credit.</p>	<p><i>machines etc.</i></p> <ul style="list-style-type: none"> • <i>Rather than describe the industrial production methods, pupils should explain why these processes are suitable for the products chosen and where appropriate how this has informed the design/manufacture/function of the product.</i> • Present a detailed evaluation of fitness for purpose. <ul style="list-style-type: none"> • <i>Candidates should include meaningful evaluative comments to describe how the product actually fulfils its functions and reflects the needs and opinions of the user.</i> • Present high level analysis of ergonomics and aesthetic suitability. <ul style="list-style-type: none"> • <i>Detailed analysis is required within this section.</i> • <i>Any rating systems used should be meaningful and clearly defined by the candidate.</i> <p><i>At the end of this section candidates should state which product they intend to develop and highlight the areas they intend to focus on. This would provide a focus for the redesign specification at the start of section 2.</i></p>
<p>Redesign solutions and development</p>	
<p>High (21–30)</p> <ul style="list-style-type: none"> • Write a detailed redesign specification. • Generate a wide range of innovative design modifications. • Evaluate in detail the viability of each modification. • Present a detailed plan for manufacture. • Produce high level working drawings for manufacture. <p>Medium (11–20)</p> <ul style="list-style-type: none"> • Write an appropriate redesign specification. • Generate a range of innovative design modifications. • Evaluate in some detail the viability of each modification. • Present an adequate plan for manufacture with suitable detail. • Produce adequate working drawings for manufacture. <p>Low (1–10)</p> <ul style="list-style-type: none"> • Write a limited redesign specification. • Generate a limited range of innovative design modifications. • Present only vague evaluation of the viability of each modification. • Present a limited plan for manufacture. • Produce only limited working drawings for manufacture. 	<p>High (21–30)</p> <p><i>The quality of the redesign specification is integral to all sections within the unit. A highly detailed redesign specification will ensure that the candidates can access high band marks for design, manufacture and ultimately testing and evaluation.</i></p> <ul style="list-style-type: none"> • Write a detailed redesign specification. <ul style="list-style-type: none"> • <i>The specification must include quantifiable/ measurable/ specific points which will assist candidates when they come to design, test and evaluate the product.</i> • <i>The key points in the specification should reflect the areas candidates intend to develop.</i> • Generate a wide range of innovative design modifications. <ul style="list-style-type: none"> • <i>Innovative : New, creative, original in the use of:</i> <ul style="list-style-type: none"> ▪ <i>Aesthetics</i> ▪ <i>Ergonomics</i> ▪ <i>Additional functions</i> ▪ <i>Material & Manufacturing process/ techniques</i> ▪ <i>Performance</i> • <i>A wide range of practical and realistic design modifications, showing a sequence of redesign development drawings, is encouraged across the areas selected for improvement.</i> • <i>Candidates are discouraged from 'bolting-on' additional features. Design modifications</i>

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<p>Zero should be awarded for a response which is not worthy of any credit.</p>	<p><i>should be integral to the original product.</i></p> <ul style="list-style-type: none"> • <i>Hand and CAD graphic communication is to be encouraged for candidates to access the top marks band.</i> • Evaluate in detail the viability of each modification. <ul style="list-style-type: none"> • <i>Evaluative annotation should focus on the selected areas for improvement and should reflect the content of the candidate’s redesign specification</i> • Present a detailed plan for manufacture. <ul style="list-style-type: none"> • <i>This plan should identify specific materials and sizes, specific components and specific manufacturing processes, assembly and finish to be used.</i> • <i>This should be written in the future tense and outline in detail the sequence of the manufacturing process.</i> • Produce high level working drawings for manufacture. <ul style="list-style-type: none"> • <i>Produced in 1st or 3rd angle with appropriate, achievable dimensions for sub-assembly and/or full assembly. Details and dimensions should be provided be sufficient to enable a independent party to manufacture the assembly and/or sub assemblies.</i> <p><i>This should be produced and presented in conjunction with the plan for manufacture</i></p>
<p>Manufacture</p> <p>High (29–40)</p> <ul style="list-style-type: none"> • Produce a high quality outcome in an appropriate range of materials. • Demonstrate clear competence in a range of production skills and processes. • Record in detail any changes in design developments brought about during manufacture. <p>Medium (13–28)</p> <ul style="list-style-type: none"> • Produce a good quality outcome in an appropriate range of materials. • Demonstrate reasonable competence in a range of production skills and processes. • Record changes in design developments brought about during manufacture. <p>Low (1–12)</p> <ul style="list-style-type: none"> • Produce a low quality outcome in an appropriate range and limited use of materials. • Demonstrate poor competence in a range of production skills and processes. • Limited detail of changes brought about during manufacture. 	<p>Manufacture</p> <p>High (29–40)</p> <p>The final outcome must show clear redevelopment and be an improvement from the original product.</p> <ul style="list-style-type: none"> • Produce a high quality outcome in an appropriate range of materials & • Demonstrate clear competence in a range of production skills and processes. <ul style="list-style-type: none"> • <i>High quality work should be manufactured in appropriately justified materials using a range of making skills and processes.</i> • <i>Both CAM and hand skills are to be encouraged for candidates to access the top marks band.</i> • <i>Products using eg. router, laser, 3D printer only will require additional workshop skills to achieve high quality and therefore access top band.</i> • Record in detail any changes in design developments brought about during manufacture.

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<p>Zero should be awarded for a response which is not worthy of any credit.</p>	<ul style="list-style-type: none"> • <i>Annotated photographic evidence may be used to record changes made during manufacture</i> • <i>Storyboards of manufacture are not required.</i> • <i>Hidden details of the product should be recorded in the portfolio to assist moderation.</i> <p><i>Note: Manufacturing should take place within the candidate's own school or college. Accreditation cannot be given for manufacturing completed outside the school or college workshop unless the teacher has directly supervised such work.</i></p>
Testing and Evaluation	
<p>High (7–10)</p> <ul style="list-style-type: none"> • Produce a high level critical and objective evaluation of the outcome. • Carry out and present an extensive range of detailed testing, showing meaningful conclusions. • Make high level proposals for further development as an outcome of testing. <p>Medium (4–6)</p> <ul style="list-style-type: none"> • Produce a satisfactory evaluation of the outcome which is mainly objective. • Carry out and present some outcomes of tests, which show mostly meaningful conclusions. • Make appropriate proposals for further development. <p>Low (1–3)</p> <ul style="list-style-type: none"> • Produce a limited evaluation of the outcome. • Show limited evidence of meaningful testing with only simplistic conclusions. • Demonstrate limited awareness of possibilities for further development. <p>Zero should be awarded for a response which is not worthy of any credit.</p>	<p><i>This section is worth 10% of the unit marks and should be afforded an appropriate time allocation</i></p> <ul style="list-style-type: none"> • Produce a high level critical and objective evaluation of the outcome. <ul style="list-style-type: none"> • <i>Objectivity of the evaluation and testing could be driven by the content of the candidate's redesign specification</i> • Carry out and present an extensive range of detailed testing, showing meaningful conclusions. <ul style="list-style-type: none"> • <i>Photographic evidence in situ of appropriate user testing with supporting comments leading to high level proposals for modification.</i> • Make high level proposals for further development as an outcome of testing. <ul style="list-style-type: none"> • <i>High level proposals, as a result of testing, should demonstrate a significant level of modifications and be drawn and annotated in detail</i>
<p>Communication: All information presented for assessment should be presented in a coherent and concise manner using a range of ICT, illustrations, extensive photographs, annotated sketches, text and other appropriate means of communication. Where work is submitted electronically, an A4 printout should be available to assist with assessment and moderation</p>	