

Unit F523 Design, Make and Evaluate A2 Coursework

Section 4a: Design, Design Development and Making

Additional guidance and 'FAQ's'

4	a DESIGN, DESIGN DEVELOPMENT and MAKING	<p><i>Demonstrate competence in the design, design development and making of the product, to include the following package of evidence:</i></p> <ul style="list-style-type: none"> • <i>the generation and exploration of design possibilities;</i> • <i>the use of digital technologies;</i> • <i>experimenting and modelling;</i> • <i>the refining and defining of a final design through ongoing evaluation; and</i> • <i>the planning and making of the product.</i> 	57
	<p>Demonstrates a high level of competence in the</p> <ul style="list-style-type: none"> • design • design development, and • making of the product. 		45-57
	<p>Demonstrates an adequate level of competence in the</p> <ul style="list-style-type: none"> • design • design development, and • making of the product. 		23-44
	<p>Demonstrates a limited level of competence in the</p> <ul style="list-style-type: none"> • design • design development, and • making of the product. 		0-22

Guidance

- Gather additional information on an 'as required' basis;
- Benefit from the opinions of others. Consult the client or potential users;
- Evaluate possible designs against the Design Specification;
- Record progress in real time;
- Mirror industrial practices where possible, e.g. use jigs and templates, CAD /CAM, quality control, and project management;
- Ensure an adequate range and depth of skills is demonstrated.

Key guidance from OCR textbook Chapter 3

Remember that a relatively simple product involving little real difficulty and challenge must include a considerable level of detail and depth if the coursework is to satisfy the examination requirements at this level. In a similar way to Section 2, you need to present a collection of evidence for assessment.

Your collection of evidence is likely to include many of the following:

The generation and exploration of design possibilities

- Sketches, drawings, and diagrams
- Annotation and notes, descriptive and evaluative.
- Ranges of possibilities and ideas

The use of digital technologies

- CAD/CAM
- Video, audio, photography
- Image manipulation software
- Simulation and analysis software

Experimenting and modelling

- 2D and 3D models - to scale and/or actual size
- Mock-ups, prototypes, trials and tests, sensory analysis, use of charts and diagrams to aid analysis and comparisons.
- Models focusing on specific details of the solution and/or models of the final proposal.
- Experimentation with techniques to improve and refine possible processes.
- Simulations and computer modelling
- All with a purpose and value, recorded in real time, and including analysis and evaluation

The refining and defining of a final design through ongoing evaluation

- Progression, evolution, refinement, increasing depth and detail (a definition of development)
- Recorded changes and modifications to the design, referring to the design specification.
- Final CAD working drawings showing clear details of the whole product and the parts
- For food items, the manufacturing specification should include:
 - Detailed recipes with specific quantities, function of ingredients used, and nutritional breakdown.
 - Sizes of components, quantities and depths of toppings, sauces, and fillings.
 - A HACCP (Hazard Analysis and Critical Control Points) chart to identify food safety issues in production and storage.
 - Allergy concerns and special claims (e.g. organic, vegetarian)
 - Packaging and labelling details, including heating instructions where appropriate.
- For items to be printed, camera-ready artwork or print masters using suitable software. A 3D outcome is required for part of the making for graphics products.
- For textiles items, a detailed lay plan using suitable software. This should include overall sizes of the pieces and the layout and positioning for the cutting of the fabric from the roll. Other important elements to include are: grain direction arrows, marks to show where parts match, seam allowances, and indication of scale.
- Exploded or cross-sectional views, details of patterns, jigs, or templates.
- A clearly defined final design which, if it was sent to a distant manufacturer, would enable that manufacturer to produce the item exactly as intended.

The planning and making of the product.

- Key stages and a clear, logical sequence for the making.
- CAD animated assembly sequences
- The sourcing and selection of bought in / pre-manufactured components as appropriate
- Use of hand and machine processes, use of CAM.
- Use of industrial processes where possible
- Video clips of key processes
- Quality control checks – ensuring the product outcome is the best it can be.
- A real-time record of progress. A diary or log, a video diary

Evidence of the following will maximise your marks:

- An appropriate range and depth of skills.
- Initiative, innovation and enterprise
- An integrated approach, combining many of the designing elements listed above
- Clear and fluent progression toward the final proposal
- Consideration of the economic use of materials, components, and ingredients.
- A planned and structured approach to problem solving. (rather than random trial and error)

- Regular consultations with client / user groups at key stages of design and development, and consumer testing and evaluation, with feedback reflected upon and used to influence product development. This mirrors professional practice where designers evaluate their design ideas and proposed solutions through contact with a representation of their target market. For example, at 'car clinics', ideas and models for new car designs are presented to specific sectors of the car-purchasing public for their opinions on a range of design aspects.
- Collaboration with others where required, team working, managing and integrating the input of others.
- The incorporation of peer group evaluation.
- Care, precision, and attention to detail.
- Technical and scientific detail including sizes, quantities, capacities, nutritional information.
- A high quality complete outcome, suitable for its intended market, and safe and easy to use and maintain.
- A detailed knowledge of the working properties and functions of materials and components/ingredients.
- Correct use of tools and equipment.
- Regular reference to, and evaluation against, the list of design requirements, namely your Design Specification.
- Additional information gathered on an 'as required' basis during development. e.g. ergonomics, safety, fittings, ingredients, components, materials
- Consideration of marketing aspects such as packaging. (See Section 6)
- Consideration of commercial and manufacturing issues.

Key Points

- Record your designing and making in real time, maintain a 'live' record.
- Organise and manage your time and resources effectively.
- Forward thinking and planning is crucial
- Benefit from the opinions and expertise of others.
- Respond positively to challenges and changes
- Ensure clear evidence of all stages is presented, including close-up photographs or video, and 'print screens' to show detail.
- Acknowledge all sources of assistance received (teacher, specialist, technician, another student....)

Marking notes

- The overall complexity, demand, and intellectual challenge involved in the designing and making will influence marks in this section. A simpler project will need to be carried out in greater depth to achieve the same marks as a more complex project.
- Pages 53-54 of the Specification: 5.11 Coursework Administration/Regulations.
In particular: *'The intention is that assessment of the coursework project should not restrict, interrupt, or influence the natural flow and progression of the candidate's design, development and making of a product to meet a need. The assessment criteria should be seen as providing a framework for assessing the candidate's approach to key elements in that process, the appropriateness, depth and quality of their work, and the level of thinking shown. It is important that assessment does not interfere with the candidate developing and using skills naturally and instinctively, guided by the teacher...'*

The assessment criteria for this section allow for the flexibility of approach.
Candidates are not limited or constrained to a prescribed approach.

Pages 44 and 45 of the Specification: 4.2 Advanced GCE Scheme of Assessment:

'Demonstrate competence in the design, design development and making of the product, to include the following package of evidence:

- *the generation and exploration of design possibilities;*
- *the use of digital technologies;*

- *experimenting and modelling;*
- *the refining and defining of a final design through ongoing evaluation; and*
- *the planning and making of the product.'*

The package of evidence of the candidates work in this section should include evidence against all five key areas listed above. However, the balance and emphasis of work in these sub-sections will vary considerably, particularly between material focus areas.

- Some products will require extensive modelling and trials to arrive at a highly suitable outcome. Food products are likely to show a wide range of development, experimentation with different ingredients and taste testing.
- Other products may require less modelling but demonstrate high-level demanding making skills in the final outcome.
- Highly effective yet relatively simple design solutions may be supported by far-reaching industrial or commercial involvement during the design development.
- The 'package of evidence' presented should enable assessment of the overall level of thinking and the range and depth of designing and making skills involved.

Q&A

Q How many design proposals should the students consider?

A There is no set number, nor should there be if the principles and ethos of this specification are followed. Having said this, three of the five key areas to be covered in this section are:

- the generation and exploration of design possibilities
- experimenting and modelling
- the refining and defining of a final design through ongoing evaluation.

The words 'exploration', 'experimenting', and 'refining' clearly imply that a good deal of alternatives, options, and choices will be considered in one form or another. A candidate may have a fairly tightly defined design concept. This may be due to the nature of the product being designed or the nature of the brief determined in conjunction with a client. This candidate's 'exploration', 'experimenting', and 'refining' would be within a tighter focus than a candidate with a more open brief, where a wider range and diversity of overall design concepts may be appropriate.

Q Does the modelling of a product in either 2D or 3D constitute development or making?

A Modelling will be classed as 'experimenting and modelling' (see above). Making refers to the final outcome in the form of a marketable product (with the exception of systems and control outcomes where the emphasis may be on the making of a system) See separate guidance document '**Guidance re. Models and Architectural Projects**'

Q What proportion of marks from the 57 available would be available for each of 'Design', 'Design Development' and 'Making'? How are the 57 marks broken down? Is there a page breakdown of the marks? How many marks are allocated to the practical and how many to the folder work? How many marks are tied in with the modelling, ongoing evaluation, etc?

A Please see the 'Marking notes' above. Because of the diverse nature of the projects which will be submitted, in a wide range of materials and technologies, there is no breakdown of the 57 marks that can apply to every project. Similarly, a page breakdown is not possible. The 'package of evidence' presented should enable assessment of the overall level of thinking and the range and depth of designing and making skills involved.

It is helpful to realise that the highest mark in the bottom assessment box is 40%, and the lowest mark in the top assessment box is 80%. These are the *notional* grade boundaries at E/U and A/B respectively. (This applies to all assessment sections for this Unit)

The following **MARK GRID** for Section 4a forms part of the CSF form used by Centres to submit the marks for this Unit to the Moderator. This is available from the OCR website.

Centres need to consider the five strands of evidence required and award marks appropriately. The grid should be used to record appropriate levels of competence for each of the five strands and then an overall best-fit mark. In the 'EXAMPLE CANDIDATE' column a best-fit mark of 38 was awarded.

The best-fit mark should take into account the particular demands of the project and be based on the overall level of capability and skill shown by the candidate. A high level of competence in one strand can outweigh a lower level of competence in another, and vice-versa.

MARK GRID Unit 523 Section 4a

- 1 *the generation and exploration of design possibilities;*
- 2 *the use of digital technologies;*
- 3 *experimenting and modelling;*
- 4 *the refining and defining of a final design through ongoing evaluation; and*
- 5 *the planning and making of the product.*

		57	EXAMPLE CANDIDATE	Candidate Number	Candidate Number	Candidate Number	Candidate Number	Candidate Number	Candidate Number	Candidate Number
HIGH Demonstrates a high level of competence	45-57	57								
		53								
		49								
		45								
		44	2	3						
ADEQUATE Demonstrates an adequate level of competence	23-44	37	1	38						
		30	5							
		23	4							
		22								
		14								
LIMITED Demonstrates a limited level of competence	0-22	7								
		0								

Q Is there any requirement for the students to evaluate their ideas leading towards a final solution, with clear reasons for choice, and if so what proportion of marks should be awarded to this?

A 'Ongoing evaluation' is a requirement in this section (see above). Progression is a key word here. Candidates should show how the design is refined and defined through ongoing evaluation (ideally with reference to the client, target market, or potential users) to a point that it fulfils the Design Specification, enabling the 'planning and making' stage. For the reasons explained above, there is no set proportion of marks for this. Whilst all projects will require ongoing evaluation in some form, some projects / products may require significant refinement, developmental testing and evaluation, perhaps where a critical tolerance or safety requirement is to be achieved.

Q Do we assume that there is no requirement for the students to show evidence of planning the manufacture?

A Please see pages 44 and 45 of the Specification: 4.2 Advanced GCE Scheme of Assessment. Here, a breakdown of the requirements for the Design, Design Development and Making section is given, and this includes 'the planning and making of the product'

Further help and guidance:

'OCR Design & Technology for A level' (Chapter 3) Course textbook published by Hodder Education.

Plus the accompanying website ISBN 978-0-340-96634-1

http://www.hoddereducation.co.uk/Title/9780340966341/OCR_Design_and_Technology_for_A_level.htm

OCR website - schemes of work, lesson plans

http://www.ocr.org.uk/qualifications/asa_levelgceforfirstteachingin2008/design_and_technology_product_design/documents.html#Support_materials

OCR's Product Design e-community website. Ideas and resources

http://community.ocr.org.uk/lists/listinfo/gce_product_design

Resources from OCR Training

http://www.ocr.org.uk/Data/publications/training/DT_Training_Programme_2009.pdf