

GCSE Manufacturing (Double Award) 1496

Assessing the Portfolio Units 4878/4879

1. General Advice.

When assessing the portfolio units, Centres are reminded that:

- this qualification represents the equivalent of two GCSEs with 66% of the final marks coming from the two portfolio units.
- the standards set in the qualification must match those of any other GCSE and consequently the entry requirements for candidates to the course should be the same;
- the time allocation for teaching this double award GCSE should be twice that allocated to a single GCSE; and
- the applied nature of the course requires candidates to have first-hand experience of 'real world' manufacturing and to encompass industrial and commercial practices in their work.

2. The Methodology of Assessment

2.1 General Issues

The nature of assessment used for the portfolios is very different to that in a 'traditional' GCSE programme or to that used in GNVQ portfolio units. Candidates should have covered all the knowledge and skills identified in the 'What you need to learn' section of each unit, as detailed in the specification, but the portfolio for each unit only needs to include the evidence identified in the relevant Assessment Grid.

It is quite feasible to cover the requirements for both of the portfolio units in one activity or task i.e. in Unit 2 the candidate makes what has been designed in Unit 1. However, this approach is fraught with danger, as the same piece of evidence cannot be used twice. For example, the Health and Safety topics and Quality Control issues identified in Unit 1 must be reworked completely if they are to be used in Unit 2, because the focus for assessment purposes in each unit is different. In addition the work must be separately assessed against each unit's assessment grid, and the evidence included referenced separately for each grid. Portfolio moderation has shown that the most successful Centres were those whose candidates presented completely separate portfolios for Unit 1 and Unit 2, with a different product for each unit. In this way, Unit 1 focuses on the work of a designer and Unit 2 on Team Production.

The methodology of assessment for these Units is that of identifying the best fit box in the assessment grid for each strand of the grid. For example, when assessing the work of a candidate in Unit 1, the 'best fits' might be a2, b1, c2, d3 and e1 for the five strands of assessment. Then within each box the assessor needs to decide which of the marks available within that box to award to the evidence in the portfolio. In box a2 for Unit 1, the evidence must show that the candidate has 'used customer feedback and associated information to produce their final

design solution' in order to achieve the full 7 marks available. Customer feedback is the more important of the two criteria and so, if there was no evidence of this, then at best the candidate could only achieve 5 marks. If customer feedback had been used but there was no evidence for the use of associated information then 5 or 6 marks could be awarded. The final mark total for the unit is the sum of the marks awarded for each strand.

Each portfolio assessed should have a URS attached to it. This should show clearly the distribution of marks for all strands with sub-totals and final total recorded. This form will provide a basis from which the moderator will work. To enable the final mark to be moderated there must be clear referencing to indicate how the mark for each strand has been determined. Good practice would dictate that in each box on the URS there are page references to show where the evidence is located within the portfolio. On each referenced page, annotation should show the location of the evidence, how it fits the assessment criteria and how it attracts the mark that has been awarded. However, the minimum requirement is that the URS must be completed for each candidate and sent to the moderator with the requested sample. The URS is a critical part of the moderation process; without it moderation cannot be carried out.

To ensure the effectiveness of this system, assessors must recognise that postal moderation requires **all** the evidence to be included and explicitly identified in the portfolio and not implied either through the completion of the task or through the assessor's wider knowledge of the candidate. To this end it is important that in each Centre there is an objective and thorough system of **internal** standardisation or moderation to ensure that:

- all assessors apply the same standards in their interpretation of the assessment criteria;
- there is an unbiased opinion that the evidence is explicit in the portfolios; and
- there is a correct and justifiable rank order of candidates' marks.

2.2 Consortia

In cases where candidates from different Centres have been taught **and assessed** together, i.e. at a local college or training establishment, but where they are entered through the Centre at which they are on roll, then the Centres involved must register with OCR that they wish to be treated as a consortium. It is vital if Centres are to be treated as consortia that they register this intention in advance of the examination session on the appropriate Joint Council application form, JCQ/CCA. This form is available from the examination secretary or the Joint Council website: www.jcgq.org.uk

All Centres involved in the consortium must be represented during the assessment of the portfolio work to ensure effective marking and standardisation of the candidates' work, in much the same way that internal standardisation will be carried out in a single Centre. This marking and standardisation procedure should ideally be carried out at one location (the training establishment) with the work of all candidates available at the same time. This ensures that:

- all assessors apply the same standards in their interpretation of the assessment criteria;
- there is an unbiased opinion that the evidence is explicit in the portfolios; and
- there is a correct and justifiable rank order of candidates' marks across all the Centres involved.

OCR will allocate a single Moderator for the consortium and all the candidates will be treated as a single group for the purpose of moderation. To this end, all candidates' work must be available, as if from a single Centre, throughout the assessment period. The Centres concerned must nominate a consortium coordinator who will undertake to liaise with OCR on behalf of all Centres in the consortium.

2.3 Despatch of portfolios to Moderators

Centres will be notified by their Moderator of the sample of portfolios required for moderation. This sample will consist of all of the Centre's entry for up to ten candidates, plus 10% of the rest for entries of eleven candidates and above. The notification is triggered by the Moderator's receipt from the Centre of the MS1 copy and the CSF. In practice, if a Centre has up to thirteen candidates, it can send all portfolios to the Moderator with the MS1 and CSF, without waiting for sample notification; this will speed up the moderation process. Centres should be aware that the sample will not necessarily include Unit 1 and Unit 2 portfolios from the same candidates; this is best facilitated if candidates have completed separate portfolios for Unit 1 and Unit 2.

Centres are advised that, to maintain security, the sample of portfolios should be sent to the moderator by a delivery system that allows tracking. Centres are reminded that neither Proof of Posting nor Recorded Delivery allows tracking.

3. Guidance on the Interpretation of the Assessment Criteria

3.1 General Issues

3.1.1 Unit 1 – Designing Products for Manufacture.

The specification requires the following processes to be evidenced in the portfolio:

- a clearly defined customer/client who provides the design brief (This cannot be the end-user of the product or the candidate);
- the candidate then works with this customer/client to develop the design brief into a design specification;
- several (three minimum) design solutions are then developed by the candidates to satisfy this design specification;
- through discussions with the customer/client, one of these design solutions is selected to be produced;
- this proposed final design solution is worked up in detail before being presented to the client.

In Strand a: if there is no clearly identified client the maximum mark is 4.

In Strand b: access to b2 and b3 depends on the candidate talking through the ideas presented and explaining what he/she is doing.

In Strand c: c1 requires Health and Safety issues to be addressed; these should be relevant to the candidate's product. c2 and c3 require the quality control procedures used in making the product to be identified. If these are not included, the c1 'default' requires the H&S issues in making and using the product (**not** H&S in **general** terms) to be identified. If Quality Control procedures are mentioned but no H & S issues are identified then the marks available for c1 (4) will not apply. H & S issues must be written down. They should not be referred to as a verbal report nor their use implied by the teacher's knowledge of the candidate.

In Strand d: the design solution should be presented to the customer. This work should be a development from strand b and work previously considered in strand b should not be rewarded again here.

In Strand e: access to e2 and e3 require quality assurances to be identified. Real World manufacturing situations relevant to the product designed must be considered in e3.

3.1.2 Unit 2 – Manufactured Products

Candidates must produce **individual** portfolios of work and these must show and include:

- a manufactured product that has at least three components/ingredients;
- that they understand quality assurance procedures (how the product will be quality assured throughout the manufacturing process);
- how they will plan and work as a team (teams could consist of 3 – 5 members);
- quality control tests (The values used for quality assurance/quality control are covered in c2 and how these affect planning and scheduling in c3);
- critical control points (Implications for production planning and scheduling); and
- how they produced a batch of **identical** products (as a guide, a batch could equal the number of candidates working in the team. However, the material area in which the team is working will determine the batch number, i.e. for some food products a greater number would be more appropriate).

In Strand a: to access a2 and a3 there must be a production plan with associated quality control identified. If there is no quality control the maximum mark is 4.

In Strand b: b2 & b3 require a schedule i.e. appropriate timescales allocated to the stages in making the product. This could be a Gantt chart that is time constrained. Allocation of team roles is also required in this strand. If no sequence or team roles are identified and b1 is therefore the best fit, then b1 requires a description of why production planning is necessary in itself and in meeting the product specification.

In Strand c: c2 requires the quality control tests in terms of equipment and procedures to be identified and, for c3, the impact on production planning and sequencing if these tests are not met must be explained. In c1 the default is to identify the critical control points and describe H&S issues pertinent to the production of the product (not just H&S issues in general terms).

In Strand d: d1 & d2 teamwork, key roles and the features that make up good teamwork must be considered. If these are not described/identified then the marks for d1 and d2 (8) are not available and maximum marks for the strand can not be awarded to candidates who only consider improvements through buying in components or ingredients as described in d3.

In Strand e: e2 requires an explanation of why the tools and equipment used were fit for the purpose in the school/college workshop context and e3 requires an explanation of how and why these would be modified in 'real world' manufacturing situations. e2 also requires any changes to the production plan to be identified or if no changes were made an explanation of why these were not needed. In e3 this explanation must be expanded to explain what impact the use of real world manufacturing tools and equipment would have on the production plan. If there is no explanation of how tools and equipment were fit for the purpose, then the maximum mark is 7.

3.2 Specific Issues Related to the Interpretation of the Assessment Criteria

Unit 1 – Designing Products for Manufacture

Unit 1 Assessment Criteria: Strand a

<p>a1. Produce a design specification from a given design brief.</p> <p style="text-align: right;">0 1 2 3</p>	<ul style="list-style-type: none">• The customer/client should be clearly identified. This should be the person or company that has commissioned the product design.• The design brief must be clearly stated, with details of any specific conditions imposed by the customer/client.• A design specification should be clearly presented with reasonable detail included.• There will be some evidence of relevant research included.
<p>a2. Produce a design specification using customer feedback and associated information.</p> <p style="text-align: right;">4 5 6</p>	<ul style="list-style-type: none">• The design specification will contain all the relevant details to enable the proposed product to be produced.• Any constraints or conditions required by the customer/client must be clearly detailed.• There should be evidence of research into relevant areas that may influence the proposed design, including existing similar items, possible materials, components, finishes, etc.• There must be evidence of communication with, and feedback from, the customer/client.• There may also be evidence of any market research that was considered necessary, and how this influenced the specification.
<p>a3. Justify their final design specification by explaining how they used customer feedback and associated information.</p> <p style="text-align: right;">7 8 9</p>	<ul style="list-style-type: none">• The reasons for including the relevant details in the design specification should be clearly stated, and explained.• Any research that was undertaken and included should be justified and referenced to the proposed design.• The results of any market research included must be explained and their effects upon the proposed design specification clearly stated.• The details of the communication with the customer/client should be explained and it should be stated how they influenced the proposed product specification.

Unit 1 Assessment Criteria: Strand b

<p>b1. Use their design specification to produce ideas for a design solution.</p> <p style="text-align: right;">0 1 2 3</p>	<ul style="list-style-type: none">• There should be a range of drawing techniques used to convey the proposed design ideas clearly and legibly.• Types of drawings to be used could include sketches, orthographic, 3-dimensional, exploded, etc.• Any computer generated drawings included should be accompanied by relevant notes.
<p>b2. Explain the use of their design specification in developing ideas for their final design solution.</p> <p style="text-align: right;">4 5</p>	<ul style="list-style-type: none">• The drawings produced should demonstrate a high standard of accuracy and clarity.• A full range of drawing techniques should be evident, as suggested in the specification.• The use of computer generated drawings is strongly encouraged.• Clear annotation should be used to help clarify and explain the proposed design ideas.• Reference should be made to the specification when explaining the ideas presented.• The ideas should be developed towards a final solution that meets the customer's requirements.
<p>b3. Fully justify their choice of a final design solution from a range of ideas.</p> <p style="text-align: right;">6 7</p>	<ul style="list-style-type: none">• The reasons for selecting the final idea should be clearly explained and reasons given why this particular idea was selected as opposed to others.• Written statements should justify the final idea choice rather than basic headings or titles.• A high standard of drawing presentation is required.• Use of tables to compare ideas may be useful.• The chosen methods of showing constructional and component details should be explained.

Unit 1 Assessment Criteria: Strand c

<p>c1. Identify Health and Safety issues that may arise in making their product.</p> <p style="text-align: right;">0 1 2 3 4</p>	<ul style="list-style-type: none"> • Any Health and Safety issues stated must relate to their proposed design solution. • General Health and Safety statements and descriptions are not acceptable. • The Health and Safety issues identified should be applied to the use of the product and to the making of the product. • This information could possibly be presented in the form of a detailed chart. • Health and Safety issues must be identified by the candidate and not presented as a statement by the teacher, such as: “the candidate worked with due regard to safety issues”
<p>c2. Identify the quality control procedures that would be used in each stage of making their product.</p> <p style="text-align: right;">5 6 7</p>	<ul style="list-style-type: none"> • Any quality control procedures that are suggested during the making of their proposed product must be specific to their proposed design solution. • There should be details of specific tests and procedures that would be applied to the proposed product during the making process. • The use of formers, templates, jigs etc. could be included. • Detail is essential when describing these proposed tests. • General quality control statements are not sufficient.
<p>c3. Evaluate quality control, quality assurance and total quality management applied to making their product.</p> <p style="text-align: right;">8 9</p>	<ul style="list-style-type: none"> • The value and importance of quality control tests when making their proposed product should be described. • Any remedial action necessary if tests proved negative should be stated. • The complete ‘package’ of quality assurance and quality management during the manufacture of their proposed product, from start to completion, should be explained in detail. • Possible reasoning could include reference to less waste of material, and the production of a quality product that meets the customer’s requirements. • General quality control statements are not sufficient.

Unit 1 Assessment Criteria: Strand d

In this strand it is the effective **presentation** of the proposed design solution to the customer/client that is assessed. (See notes in 3.1.1)

Any evidence already **marked** as part of **strand b** cannot be **re-marked** in this strand.

However, if any material in **strand b** forms a necessary part of the presentation, it can be referred to as part of the presentation evidence.

<p>d1. Use diagrams, sketches and other appropriate methods to present their design solution to the customer.</p> <p style="text-align: right;">0 1 2 3 4</p>	<ul style="list-style-type: none"> • The final idea should be presented to the customer so that he/she can see what is being proposed as a final idea. • The way that the item is presented can be done in a variety of ways, such as quality sketches, pictorial drawings, computer generated drawings, orthographic drawing, mood boards, modelling. Good practice shows that a combination of several of these methods is beneficial.
<p>d2. Use diagrams, sketches and other appropriate methods, including modelling, to explain their design solution to the customer.</p> <p style="text-align: right;">6 7 8</p>	<ul style="list-style-type: none"> • Presentation of the information and drawings etc. should be of a quality standard. • The final idea not only needs to be presented to the customer but an explanation should be given to support the work. • Power point presentation slides may help to detail a presentation given to the customer. • Written statements to explain the final idea and reasons given for selecting such a product. • Reference to the customer's initial requirements in the specification and findings from carrying out research.
<p>d3. Use diagrams, sketches, working drawings and other appropriate methods, including modelling, to justify their design solution to the customer.</p> <p style="text-align: right;">9 10</p>	<ul style="list-style-type: none"> • The final idea needs to have statements made about it to convince the customer that this final product does meet the initial specification. • Written statements should be given to justify the decision to the customer with extra drawings including views such as sections, profiles and cut-aways. • Working drawings with extra information such as dimensions and suggested materials and surface treatment may be appropriate. • Further improvements/developments could be included.

Unit 1 Assessment Criteria: Strand e

<p>e1 Identify the manufacturing processes that would be used to produce their product in quantity.</p> <p style="text-align: right;">0 1 2 3 4 5 6 7</p>	<ul style="list-style-type: none"> • Work should relate to the candidates product and should not be related to the manufacturing process in general terms. • The candidate should consider his/her proposal and state the manufacturing processes that would be used to produce their product in quantity. • The differences between manufacturing prototypes/one offs and producing items in quantity should be explained. • Changes in processes used when producing one offs to those used when producing a quantity should be identified.
<p>e2 Identify the stages and associated quality assurances that will be used to manufacture their product.</p> <p style="text-align: right;">8 9 10 11</p>	<ul style="list-style-type: none"> • The processes that could be used to manufacture the product should be given in a sequence that would be followed when producing the item. • Explanation could be given as to why these stages are in such an order. • Quality control checks/tests that would be carried out during the manufacture should be identified and explained. • Reasons should be given as to why the quality control tests should be used, and why they are important to the manufacturer and the customer.
<p>e3. Evaluate and justify the stages and associated quality assurances they will be use in the manufacture of their product, with particular reference to “real world” situations.</p> <p style="text-align: right;">12 13 14 15</p>	<ul style="list-style-type: none"> • The processes that could be used to manufacture their product should be explained; alternative methods could be considered and evaluated. • Final decisions should be fully justified with supportive comments. • Quality assurance processes relating to the product should be explained and reasons for using them given. • How the product would be manufactured in quantity in Industry should be explained with the candidate identifying and explaining changes to production methods and even alternative materials. • Industrial production methods should relate to the product and not be general points.

3.2 Specific Issues Related to the Interpretation of the Assessment Criteria

Unit 2 – Manufactured Products

Unit 2 Assessment Criteria: Strand a

<p>a1. Describe a simple manufacturing process, using ICT as appropriate.</p> <p style="text-align: right;">0 1 2 3</p>	<ul style="list-style-type: none">• A manufacturing process relevant to the project to be undertaken should be identified.• The process should be described.• The use of photographs or other images to support the explanation should be encouraged.
<p>a2. Produce a production plan that identifies the manufacturing processes and quality control.</p> <p style="text-align: right;">4 5 6</p>	<ul style="list-style-type: none">• A production plan for manufacturing the product should be given which highlights the various tasks that will be carried out.• The plan could be produced in a variety of forms including a list, table, flow chart etc.• Manufacturing processes that will be carried out when making the product should be identified and explained. These could be covered by including extra columns on the aforementioned table/chart.• Quality control points should be identified and explained.• Checks that can be carried out while making the product should be identified, explained and reasons given as to why they are necessary. Sketches may be appropriate to support the written explanation.
<p>a3. Evaluate their production plan, in relation to manufacturing processes and quality control.</p> <p style="text-align: right;">7 8 9</p>	<ul style="list-style-type: none">• Review the production plan and evaluate why it has been set up in a particular way.• Justify any decisions that have been made for the sequence and methods that will be used.• Evaluate processes saying why they have been selected and comment on their efficiency.• Evaluate quality control methods that have been identified in the production plan and say why they have been selected, how they will be carried out and why they are necessary.

Unit 2 Assessment Criteria: Strand b

<p>b1. Describe the importance of accurate production planning and of meeting the product specification.</p> <p style="text-align: right;">0 1 2 3</p>	<ul style="list-style-type: none">• Describe how production planning is important.• Describe how a detailed production plan could affect the quality manufacture of a product.• Detail the specification of the product to be manufactured.• Describe why it is important for a product to meet the customer specification.
<p>b2. Identify in their production plan the schedule for manufacture and allocate roles to team members.</p> <p style="text-align: right;">4 5</p>	<ul style="list-style-type: none">• Give a schedule to show the manufacture of the product.• The schedule could include time scales and order of production.• Team roles should be allocated to members of the group.• Identify who will carry out specific tasks in the production plan.
<p>b3. Evaluate their production plan in terms of how the schedule of manufacture could be improved and why particular roles were allocated to particular team members.</p> <p style="text-align: right;">6 7</p>	<ul style="list-style-type: none">• Review the production plan and explain why it has been set up in a specific way.• Suggest how the production plan could be adapted to improve the system of manufacture.• Review the team that is to be used to produce the product.• Explain why particular roles were allocated to team members.• It may be beneficial to identify practical strengths and weaknesses of members.

Unit 2 Assessment Criteria: Strand c

<p>c1. Identify key control points during manufacture and describe the importance of Health and Safety.</p> <p style="text-align: right;">0 1 2 3 4</p>	<ul style="list-style-type: none"> • Any Health and Safety issues stated must relate to the production of their product. • General Health and Safety statements and descriptions are not acceptable. • The Health and Safety issues identified should be applied to the use of the product and to the making of the product. • Key control points should be detailed, stating what they are and how and when they will be used.
<p>c2. Use quality control tests and carry out work with due regard to Health and Safety, including reference to appropriate safety systems.</p> <p style="text-align: right;">5 6 7</p>	<ul style="list-style-type: none"> • Any quality control procedures that are suggested during the making of their proposed product must be specific to their proposed design solution. • There should be details of specific tests and procedures that would be applied to the proposed product during the making process. • The use of jigs, templates, formers etc. could be included. • Detail is essential when describing these proposed tests. • General quality control statements are not sufficient. • Health and safety issues should be identified that need to be followed while making the product. • Safety systems should be listed and use of these should be explained.
<p>c3. Explain and justify how the production planning and scheduling could be improved to encompass total quality management and appropriate safety systems.</p> <p style="text-align: right;">8 9</p>	<ul style="list-style-type: none"> • The value and importance of quality control tests when making their proposed product should be described. • Any remedial action necessary if tests proved negative should be stated. • The complete 'package' of quality assurance and quality management during the manufacture of their proposed product, from start to completion, should be explained in detail. • Possible reasoning could include reference to less waste of material. • General quality control statements are not sufficient. • Produce a range of statements to explain how production planning could be improved.

Unit 2 Assessment Criteria: Strand d

<p>d1. Describe the features of good teamwork in the manufacture of a product.</p> <p style="text-align: right;">0 1 2 3 4 5</p>	<ul style="list-style-type: none"> • Make statements to explain how the team should work together. • Reference could be made as to how the team will meet and communicate with each other. • How decisions will be made or issues/disputes resolved will be explained.
<p>d2. Identify effective teamwork for different aspects of manufacture, identify key roles during the preparation of materials, components, equipment and machinery in the manufacture of their product</p> <p style="text-align: right;">6 7 8</p>	<ul style="list-style-type: none"> • A tiered system of tasks and support could be set up but this should be explained and how roles in the system were allocated. • Examples of good practice could be taken from Industrial experience and applied to the task identified. • Key roles will be identified at the various stages during manufacture and team members will be allocated to carry out activities at these points. • Responsibility will be allocated for Quality Control tasks.
<p>d3. Explain methods of improving the production of their product by more effective use of the manufacturing team and through improvements that could be made as a result of buying in ingredients or components.</p> <p style="text-align: right;">9 10</p>	<ul style="list-style-type: none"> • Reflection will be needed regarding the production methods and suggestions should be written down suggesting how the system could be improved. • Ways of making the production system more effective should be considered and these should be evaluated. • Consideration should be made regarding the purchase of specific items that would make the system more efficient. • Reasons should be given as to why the purchase of pre made parts/items would be considered and these could include quality issues, stock issues, speeding up the system. • Effects of bought in parts not being up to standard/quality or not arriving on time could be considered and discussed.

Unit 2 Assessment Criteria: Strand e

<p>e1 Describe how they produced their product using appropriate tools and equipment.</p> <p>0 1 2 3 4 5 6 7</p>	<ul style="list-style-type: none">• An evaluation of how the product was produced should be carried out.• Issues that have arisen from the manufacture of the product should be described.• Tools and equipment used should be identified.• Such work could be carried out on a chart designed specifically to be a log of events carried out, however information contained should be described and not just presented as a list of key words.
<p>e2 Explain why the tools and equipment used were appropriate to the task and identify any changes they have made to their production plan.</p> <p>8 9 10 11</p>	<ul style="list-style-type: none">• An explanation should be given as to why certain tools and equipment were selected.• Reference should be made as to why these were the most appropriate to the tasks carried out.• Changes that have been made during the production of the item should be logged and explained.
<p>e3. Evaluate their product in terms of the tools, equipment and processes they have used and comment on how these would be modified in “real world” manufacturing.</p> <p>12 13 14 15</p>	<ul style="list-style-type: none">• The final product should be fully evaluated with reference made as to how and why it was manufactured in a particular way.• Tools, equipment and processes used should be evaluated and reference made as to how these could have changed if other resources had been available.• The candidate should make consideration and present evidence to show how the product could or would have been produced in quantity in an industrial situation.• How would volume production affect processes, materials and equipment used?• Industrial experience/reference should relate to the product produced by the group and should not be a general description of industrial processes.