

Moderators' Report/
Principal Moderator Feedback

Summer 2012

Principal Learning

Manufacturing and Product Design
Level 1 Controlled Assessments

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Introduction

In this series all of the available internally assessed units for the Level 1 Principal Learning in Manufacturing and Product Design were offered for moderation and award. Entries were received for Units 2, 3, 4, 5 and 6.

The specific reports for the units submitted for moderation are provided below.

For the internally assessed units, the majority of candidates were able to perform to an appropriate standard with marks being gained across the whole range of learning outcomes.

Administration for the internal units was generally good, with the correct samples being provided. Most Candidate Record Sheets (CRS) were correctly completed with full candidate details and marks. Most candidate work was organised in such a manner that it was straightforward for the moderators to locate the evidence for each Learning Outcome.

It should be noted that guiding the moderator to specific pages where candidates work has been credited helps with the moderation process.

Unit MP102_1A

Dealing with Customers and Suppliers in Manufacturing

General comments

There was evidence of centres delivering this unit by considering how local manufacturing businesses operated. The use of real life situations appears to motivate candidates and is to be encouraged wherever possible.

Learning Outcome 1 (Marking Grid A)

In this criterion candidates are required consider the importance of customer service procedures such as forming good relationships. For candidates performing within mark band 1 it is sufficient to indicate, i.e. point out, their importance. The use of case studies may help candidates access the content of this unit. The Times 100 business case studies are one free source of potential information that centres may find useful. These may need adapting by teachers to allow candidates with level 1 literacy skills to access the content. Where candidates are provided with resources there should be evidence of them using, or extracting, information from them.

Learning Outcome 2 (Marking Grid A)

For this criterion candidates need to consider how employees add value to an organisation. For candidates operating within band 1 multiple choice tests, completing sentences with missing words or matching terms to their definitions would all be appropriate methods to provide evidence of completing the criterion. For candidates performing within band 3 there should be evidence of work being produced with greater independence.

Learning Outcome 3 (Marking Grid A)

For this criterion candidates need to consider the legal and ethical issues. The comments for learning outcome 2 could be applied equally for this component to provide evidence for band 1. The Times 100 provides a case study titled 'Primark - Providing consumers with ethically sourced garments'. This sets the subject in a context that many candidates will be familiar with. The information is presented in a manner that is accessible to secondary school candidates.

Possible content for an A* assignment

Below is an indication of what a centre might encourage candidates to present as evidence for this unit. It is not a definitive list, simply an indication of what might be included.

At level 1 A* grade candidates are likely to be able to construct and organise, with a degree of independence, their own format of evidence.

Learning Outcome 1 (Marking Grid A)

Candidates could make comments that consider how several aspects of customer service are important to the company, internal customers, external customers and suppliers. There would not be a great deal of depth to the judgements made but there would be coverage of several elements from each of the three sections.

Learning Outcome 2 (Marking Grid A)

Candidates could make brief comments that describe at least four of the following aspects; meeting deadlines, flexible working, team working, delivering good customer service and suggesting improvements. These may be supported with examples taken from case studies. For each of the aspects they could make simple statements about how these add value to the business.

Learning Outcome 3 (Marking Grid A)

Candidates could describe several of the main features of three different laws that apply to a particular sub sector of manufacturing. They could offer short descriptions of the ethical considerations related to environmental effects and social responsibility.

They could list several of the main rights provided to the consumer by the Sale of Goods Act. They could then illustrate how these would be applied for the benefit of the consumer. These may take the form of case studies that illustrate how the consumer can use laws to support them when dealing with suppliers of goods or services.

Learning Outcome 4 (Marking Grid B)

For both parts the assessor could provide a witness statement that the candidate has taken part in a role play exercise. This may be supported by photographic evidence. The candidate could make simple statements about how their own contribution was a key role in the activities undertaken. The candidate may assess their own performance.

Candidates may have taken part in at least two different role play activities dealing with a customer and a supplier.

Unit MP103_1A

Introduction to Working Practices in Manufacturing

General comments

There was evidence of centres taking candidates to visit employers to set the context of this unit in realistic working environments. This enhances candidate experience and is a very useful technique.

Learning Outcome 1 (Marking Grid A)

A range of styles of work were submitted for assessment. Where candidates were provided with headings for a written report the full range of marking criteria were more frequently covered. Diagrams were often a successful method of indicating the links between different departments.

The responsibilities of employers and employees tended not to be undertaken particularly well. This was due to several factors, including only considering either the employer or employee. In future series, centres may wish to provide candidates templates that have separate headings for employer and employee responsibilities.

Learning Outcome 2 (Marking Grid A)

Most candidates produced materials that referenced specific aspects of health and safety legislation, such as the need to wear goggles, rather than refer to the acts of law that require their use. This is something that should be addressed in future series. The need to refer to environmental laws was frequently overlooked. In future series, centres may wish to make use of materials available from the HSE website to introduce candidates to the range of laws applicable to different manufacturing businesses.

Learning Outcome 1 (Marking Grid B)

The marking grid for this criterion is split into two parts, but centres frequently gave a combined mark for both sections. This practice should be avoided in future series.

Where candidates reviewed their performance as a member of a team moderators were clearly able to understand the grading decisions made by internal assessors. Some centres provided witness statements which again supported the marks awarded. Templates for witness statements are available from the Edexcel website.

There were a full range of marks awarded to candidates. This supports the accuracy of teacher assessment given the probable wide range of candidate personalities and abilities that submitted evidence for this unit. In future series, centres may wish to encourage all candidates to review their own performance.

Possible content for an A* assignment

Learning Outcome 1 (Marking Grid A)

Candidates will base the submission around a manufacturer from a sector they are familiar with. For example if they have undertaken practical work in the production of food products, they will consider a food manufacturer.

Candidates will begin by describing the function of different areas such as sales, production and maintenance departments. This may take the format of describing how a typical task for each department starts, what they do with the task and how they know the task has been completed.

From this overview of the departments, specific job roles in each department would be considered.

A diagram would then be produced that illustrates how the different departments / jobs in the organisation interact with each other.

For the second component of the learning outcome candidates will produce a table that describes the responsibilities that employers and employees have towards each other. For example:

| Employer | |
|--------------------------------|---|
| Responsibility | Description - The employer will: |
| health and safety requirements | Provide free of charge appropriate PPE Ensure all tools and equipment used comply with appropriate safety standards. |
| Staff training | |
| employment contract | |
| anti-discrimination policies | |

| Employee | |
|----------------------------|--|
| Responsibility | Description - The employee will: |
| health and safety training | Use PPE provided Use tools and equipment in the correct way |
| attendance | |
| punctuality | |
| positive work ethic | |

Learning Outcome 2 (Marking Grid A)

A similar table to that produced for LO1 would provide structure for candidates to enter descriptions of the relevant health and safety and environmental legislation related to a specific manufacturing sector.

A possible approach to producing evidence relating to codes of conduct would be to provide candidates with an existing code of conduct from a relevant employer. Using this as a starting point, candidates would then

add their own descriptions of what the requirements mean and why they are important.

For the third and final element of this learning outcome the specification gives examples such race, culture, national origin, region, gender, sexual orientation, age, marital status, politics, religion, ethnicity and disability. Candidates could provide statements about what employers are expected to do in order to ensure compliance with relevant legislation. An approach that either considered two of these aspects in depth or four in less depth would be suitable.

Learning Outcome 3 (Marking Grid B)

It is important that that the teamwork task candidates undertake is of sufficient complexity to allow them to demonstrate they can work independently towards goals, behave responsibly, organise time and show flexibility.

They must also be able to demonstrate how they contribute to effective and safe team working. Observation records, photographs, video recording or candidate diaries would probably be combined to provide evidence to support the award of marks allocated to this section.

Unit MP104_01

Introduction to Product Design and Development

General comments

The quality of work candidates can submit for this unit is directly related to the quality of the brief they are provided with by their centre.

Learning Outcome 1 (Marking Grid A)

This criterion requires candidates to review the needs of a client brief. The quality of the brief is very important. Where centres provided candidates with a simplistic brief the candidates were not able to access the higher marks. Centres should ensure that the brief contains sufficient information to allow candidates to produce work at the band 3 level. Centres may wish to provide candidates with an electronic editable version of the brief that will allow them to add their reviews directly underneath each of the key features.

Learning Outcome 2 (Marking Grid A)

For this criterion candidates should provide evidence that they have investigated a range of potential materials. This should be supported with reasons for choosing particular materials to use in their design proposals. Centres might consider using a 'scoring' approach to the properties of range of materials. This would provide candidates with a method to select materials based on objective criteria.

Learning Outcome 3 (Marking Grid A)

The specification provides a range of examples of the issues that manufacturers could consider when designing a product. These include market for product, legislation, costs, aesthetics, customer and client needs and sustainability. Candidates need to describe at least two of these factors. This section tends not to be completed well by candidates. There may be a need for centres to focus candidate activities towards generating evidence explicitly linked to these requirements.

The second part of the learning outcome has the focus on CAD/CAM and how these could be used in their product design. Most candidates were able to produce valid evidence to support the award of marks in the middle to higher bands.

Learning Outcome 4 (Marking Grid A)

This criterion has 2 components, the first covers research and design, whilst the second covers the PDS and modifications to the design.

A possible starting point for the research would be to consider existing products similar to that required by the client brief. For candidates working

within band 1 collecting images may be appropriate. As candidates progress to band 3 these images could be considered and commented upon. Candidates are assessed on the designs they produce. When this unit is delivered in conjunction with unit MP106- Making a Product, care should be given to ensure the evidence provided is about the designs, not the artifacts produced. The design process should result in a working drawing.

Candidates should then seek the feedback of another person or persons to comment on their PDS. A simple market research style survey may be an appropriate technique for this. For candidates performing within band 1 it may be appropriate to provide them with a prepared set of questions to ask about their proposal. As candidates progress towards band 3 these supportive structures should be reduced allowing greater autonomy.

This feedback should then be used to generate modifications to the design proposal.

Explicit evidence of the modifications to design proposal should also be included.

Possible content for an A* assignment

Below is an indication of what a centre might encourage candidates to present as evidence for this unit. It is not a definitive list, simply an indication of what might be included.

Learning Outcome 1 (Marking Grid A)

Candidates could review and explain the importance of function, styling aesthetics, performance, intended markets, size, timescales, cost, and anticipated quantities. They could go on to make notes about how these considerations will be developed into a PDS.

Learning Outcome 2 (Marking Grid A)

Candidates could produce a list of several materials suitable for the product required by the client brief. They could make statements about why the materials would, or would not, be suitable.

Learning Outcome 3 (Marking Grid A)

Candidates could make statements that describe the market for the product, laws that relate to the product, manufacture, logistics and appearance. They could then go on to describe ways that CAD and CAM could be used in the design and manufacture of the product.

Learning Outcome 4 (Marking Grid A)

For part 1 candidates could undertake research into existing solutions, materials and processes related to the client brief. They could then go on to produce freehand sketches, isometric and orthographic drawings of a design

proposal. They could also produce a PDS that details aspects of form, materials and production methods. Candidates could then use this as a focus for a questionnaire. The results of the survey could lead to suggestions about improvements that will be incorporated into the PDS.

Unit MP105_1A

Introduction to Materials Science in Manufacturing

General comments

There was some evidence of this unit being delivered in an innovative manner with candidates undertaking a range of practical activities.

Learning Outcome 1 (Marking Grid A)

This learning outcome requires candidates to develop an awareness of the types of tests that can be performed on materials and the safety procedures associated with these tests. This year most centres demonstrated a good balance between the range of different tests candidates undertook and the amount of data collected from these tests. In previous years greater focus tended to be given to collecting large amounts of data of limited value.

Centres should consider how their candidates standardise tests across a range the range of materials. Where inconsistent test procedures are used candidates will have greater difficulty in interpreting what the results means for the materials.

Learning Outcome 2 (Marking Grid A)

For this criterion candidates need to develop an awareness of the properties of materials. Centres could consider an approach that looks at least one property from each of the following; Chemical, Biological, Physical, Mechanical and Characteristics.

Learning Outcome 3 (Marking Grid A)

This outcome requires candidates to collect, present and report on test results.

Where centres have access to IT facilities consideration should be given to using them to support candidates' work. For example, recording results in a spread sheet would allow graphical representation of the results.

Possible content for an A* assignment

Below is an indication of what a centre might encourage candidates to present as evidence for this unit. It is not a definitive list, simply an indication of what might be included.

At Level 1 A* grade candidates are likely to be able to construct and organise, with a degree of independence, their own format of evidence.

Learning Outcome 1 (Marking Grid A)

Candidates describe tests that cover at least three different techniques. This could cover at least 2 different sections from; Chemical, Biological, Physical, Mechanical or Characteristics. It is probable the materials being tested will come from their own area of practical experience (e.g. catering or engineering) and another less familiar area.

The candidates make brief statements about a range of safety rules that should be observed when conducting material testing. There may also be an indication of the consequences of not observing the rules.

Learning Outcome 2 (Marking Grid A)

Candidates name at least 6 different properties of materials. There will be some expansion of what the property means.

Learning Outcome 3 (Marking Grid A)

Candidates would use a spreadsheet to record tabular data collected from a range of tests. Candidates then make simple statements about observations they have made during the testing. This might take the format of " I saw this ... this means this....."

Learning Outcome 4 (Marking Grid B)

The assessor would provide a witness statement that the candidate has taken part in the practical testing of a limited range of materials. This may be supported by photographic evidence.

Unit MP106_1A

Making a Product

General comments

This unit requires candidates to work in teams to plan the manufacture of a product. They need to take into account laws and regulations as well how the number of items being made affects production.

Learning Outcome 1 (Marking Grid A)

This learning outcome has three separate elements;

- The calculation of material quantities
- Selection of tools, materials and equipment
- Quality control

For the first element there was some evidence of centres giving greater focus to the costs of materials, rather than the amount of materials required. While these are similar skills to calculating material quantities this is not the focus of the assessment criteria.

Centres might consider one of the following approaches to providing the evidence required;

- Candidates could be given a recipe for a single product. From this they could calculate the amount of ingredients required to make a batch of the product. This could incorporate how many standard size packages would be needed for this amount. For example fourteen eggs might mean 3 packs of six would be needed.
- Candidates could be provided with a pattern for a garment. From this they could determine the length of fabric required for a single product, as well as a batch of products.
- Candidates could be provided with a drawing of an artefact. From this they could extract the amount of materials required for one artefact, and hence a batch.

At mark band 1 it is probable sufficient evidence could be generated by a candidate solely through the demonstration of the ability to perform addition with some accuracy. Candidates performing in the mark band 3 criteria will probably provide evidence of multiplication/division skills. These are suggestions are intended as guidance and are not an explicit requirement of the specification.

It is important that the moderator can follow the calculations the candidates perform and the allocation of assessor marks. Centres might wish to consider providing the moderator with a worked example of the calculations to assist in the judgement of the accuracy of the candidates work.

In the second section of this outcome candidates are required to select materials, tools and equipment. These will frequently be presented in the form a production plan which is made use of in later stages. While

candidates are expected to work in teams to discuss the planning process, the actual plans should be produced as individuals. The production process is required to involve selecting computers or control systems. The evidence for use of computers could range from CAM e.g. using a laser cutter, to producing some graphics printed onto paper and attached to the artefact.

Learning Outcome 3 (Marking Grid A)

The learning outcome has the focus of scales of production and factors affected by these scales of production.

The scales of production listed in the specification are one off, small batch, batch, continuous and flow.

A possible approach for candidates to produce evidence for this criteria would be to produce a table that lists and describes the interactions between scales of production and factors. For example,

| Factor | production techniques | material requisitioning | costs | production facilities |
|------------|--|--------------------------------|--|-----------------------|
| Scale | | | | |
| One off | | Materials purchase as required | | |
| Batch | CAM that can be set up for different repetitive tasks used e.g. laser cutter | | | |
| Continuous | | | "Bulk" buying allows discounts to be achieved. | |

Learning Outcomes 1 and 2 (Marking Grid B)

Detailed observation records supported with annotated photographs are the type of evidence appropriate to support the marks awarded for this learning outcome.

Possible content for an A* assignment

Learning Outcome 1 (Marking Grid A)

Teams of candidates are presented with a drawing or recipe that has sufficient detail to allow them to manufacture the product. They discuss how

many of the products they are going to make, the amounts of materials needed and how to check the quality of the products.

As individuals they calculate the amount of materials required to make a batch of the products. Candidates should relate the amounts they need to the standard sizes the products are available in. For example 1750g of flour would need two 1000g bags to be purchased.

Candidates could then be provided with a template onto which they enter plans about how to manufacture the product. A possible set of headings for the template are shown below.

| Step | Time | Tools to be used | Description of task | Quality Control | Safety |
|------|------|------------------|---------------------|-----------------|--------|
| | | | | | |
| | | | | | |

The quality control column would provide the evidence required for the final element of the learning outcome.

Learning Outcome 2 (Marking Grid A)

An empty copy of the table suggested above could be provided to the candidate where they enter their own descriptions of how the factors and scales of production interact.

| Factor | production techniques | material requisitioning | costs | production facilities |
|------------|-----------------------|-------------------------|-------|-----------------------|
| Scale | | | | |
| One off | | | | |
| Batch | | | | |
| Continuous | | | | |

For Marking Grid B candidates could be encouraged to produce a diary that records their personal contributions to their teams performance.

Conclusion

Based on the evidence of the work submitted for moderation, the Edexcel Manufacturing and Product Design Diploma (Principal Learning) appears to be providing Level 1 candidates with a varied, accessible and rewarding learning experience.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

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