

## **GCSE**

### **Manufacturing**

General Certificate of Secondary Education **J505**

General Certificate of Secondary Education (Double Award)  
**J510**

### **OCR Report to Centres June 2014**

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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# **B231 Study of a Manufactured Product and Manufacturing a Product**

## **General Comments**

In general, the work provided by centres was well presented and carefully marked and the detailed annotation provided by many Centres was much appreciated by moderators. Where folders were clearly divided into sections, it was easier to determine how the centre had awarded their marks. It is best practice to present folders in this way and centres are urged to encourage candidates to do this.

This year, many more centres made use of the OCR Repository and submitted work electronically. Creative use of new media can not only motivate candidates to produce exciting, high quality work, but also considerably reduces the cost when providing samples for moderation.

Centres are reminded of general OCR requirements when submitting work for moderation, especially the need to clearly identify each item with Centre Number and Candidate Number. For electronic submissions, the details should be provided in the filename of every file and the folders organised in a structured way so that the evidence can be accessed easily by moderators. Centres attention is drawn to the additional guidance on electronic controlled assessment in Appendix A of the Specification. Paper folders should have the pages securely fixed inside a cover sheet.

Centres should note that slide binders or paper clips should not be used for securing candidates work, as these can become detached in the post and do not keep the candidates' work securely together. Further details of these requirements are found in the OCR GCSE Manufacturing Specification.

Centres are reminded that the purpose of the moderation portfolio is for the candidate to evidence her or his achievements and to communicate this achievement to the moderator and others. It is therefore helpful for each section to identify which part of the assessment criteria the evidence is seeking to address, making it clear to the moderator how the centre awarded their marks and resulting in a straightforward moderation and assessment process.

The comments provided by many centres on the record of assessment form URS967/8 were helpful in explaining the reasons behind the marks awarded. Centres are reminded of the requirement to clearly attach this form to the front of the assessed work of each candidate.

Centres are reminded that candidates cannot be awarded marks for work that is not covered by the specification and work must be clearly identified and aligned to a particular section of the specification. The OCR specification includes notes of guidance for use of the 'Best Fit' approach to marking. This can be found in section 4.3. Marking should be positive, rewarding achievement rather than penalising failure, and centres should adopt the approach described in section 4.3 of the Specification. Firstly, the descriptor that matches the candidate's work should be identified. Then, a value judgement should be made as to whether the candidate 'convincingly', 'adequately' or 'just' met the criteria statement, and the mark placed within the band accordingly.

In some cases, a candidate may meet the criteria at the top level for one aspect and, say, the lower level for another aspect. In these cases, the above process should be followed for each aspect, and the average of the two scores recorded as the candidate's mark. For example, if the work 'convincingly' met the criteria in the top box for 'suggested modifications' yet 'just' met the criteria for 'batch production' in the middle box, the overall mark would be the average of 12 and 5, in other words 8 or 9.

Centres are reminded that the focus of the work selected by candidates for controlled assessment tasks must be based on the lists provided in the OCR GCSE Manufacturing Specification. Candidates should not submit work for assessment that does not meet this requirement.

Certain words and phrases used within the marking criteria sometimes cause questions to be raised. It is not possible to give precise guidance as to how phrases such as 'wide range' or 'justified' should always be interpreted. The context and type of product being studied must always be taken into account. If the evidence is presented as a simple list with no explanation, then there has clearly been no attempt at justification and the work should not be marked using a criteria block that refers to 'justified'. However, it is important to apply a 'sense check' to the amount of justification that can reasonably be expected for a particular product and this can, of course, vary from one product to another.

## **Comments on Individual sections**

### **Unit B231 1A**

Centres are reminded that work for Unit B231 1A 'Study of a Manufactured Product' requires candidates to select a product from the list and then identify two further, similar products that have subsequently been developed using modern technology. There should be a discernable link between the three products and some evidence of how technology has enabled these developments; e.g. improvements in plastics production enabled the material to be used to manufacture kettles which, in turn, enabled more sophisticated shapes to be employed in kettle design. Centres are reminded that only one product from the list should be chosen.

Candidates should be careful to address the correct topic for each section. For example, in B231 1A 'Study of a Manufactured Product' where a section requires an explanation of the manufacturing processes used, few if any marks can be awarded for work that refers only to the materials and components used to make the product, however comprehensive and well presented the explanation is.

### **Unit B231 1B**

Centres must provide clear evidence for the making of a prototype of their design solution in Unit B231 1B. Best practice is to provide 3 or more photographs, taken from different angles and with enough detail to clearly show how complete the prototype is and also to give a clear indication of its quality. If the prototype contains several different parts, for example an electronic circuit and a casing, then photographs must clearly show each part.

If a centre awards marks against the criteria statement 'The candidate makes a complete, quality prototype of the design solution that allows for detailed testing', moderators must be presented with enough evidence to determine that the work meets this criteria, rather than that in one of the other blocks such as 'The candidate makes a prototype of the design solution that may be incomplete in part, with limited opportunity of testing' or 'The candidate makes an adequate prototype of the design solution that provided opportunity for some testing.' It is very important that this aspect of the assessment is carried out correctly and fully evidenced and it is encouraging to see many centres providing excellent photographic evidence.

## B232 Manufacturing Processes

### General Comments

This is a one hour examination paper that requires candidates to have a sound knowledge related to the products and manufacturing environments/sectors that they have studied.

Most candidates attempted all of the questions on the paper but, in a number of cases, there was some evidence of candidates not having read questions carefully before answering. It is most important that candidates take the time to read through the question paper before attempting to answer questions, as this can help to ensure that basic errors are avoided.

Questions relating to basic materials and components were generally quite well answered, but this was not the case with 'modern materials'. Knowledge and understanding of modern technologies and their application was found to be quite limited.

### Comments on Individual Questions

- Q1 (a)** This question was attempted by all candidates and was generally well answered. Where marks were lost, this was often due to some uncertainty as to the correct title of chosen manufacturing sectors and appropriate products manufactured in those sectors
- Q1 (b)** In this question, candidates were asked to identify 'modern technologies' used in the manufacture of one of the products that they chose in **Q1(a)**. In general, the question was not well answered, with a significant number of candidates relying on standard responses such as CAD and CAM as their chosen modern technology.
- Q2 (a)** This question was attempted by all candidates and was very well answered, with the majority of candidates able to place named stages in the manufacture of a product in the correct order.
- Q2 (b)** Although able to place stages of manufacture correctly in part (a), very few candidates were able to name a tool or item of equipment that would be used in the packaging stage.
- Q2 (c)** Those candidates who did score marks on part (b) also scored well on this question and were able to describe safety precautions that would need to be observed when using the tool or item of equipment chosen in part (b) above.
- Q3 (a)**
- (i) This question was not well answered with only a small number of candidates understanding the meaning of the term 'forming' as a process stage during the making of an engineered product.
  - (ii) This question was attempted by all candidates and was generally very well answered. Where marks were lost, this was often due to naming a finishing product rather than a finishing process as required.

- Q3 (b)** This question was attempted by virtually all candidates with the majority gaining at least one of the four marks on offer. Where marks were lost, this was generally due to some confusion as to benefits to a company specifically in relation to the supply of materials, components and ingredients.
- Q4 (a)** This question was attempted by all candidates and was very well answered. Virtually all candidates were able to give a good explanation as to why a manufacturer would make a prototype of a product prior to full scale production.
- Q4 (b)** This question was attempted by virtually all candidates, most of whom were able to name a method that could be used to make a prototype.
- Q5 (a)** This question was not well answered with only a very small number of candidates able to give a satisfactory explanation together with an example as to what a composite material consists of.
- Q5 (b)** It was somewhat disappointing to see that a significant number of candidates chose not to attempt this question. Where responses were presented, only a small number of candidates were able to give a satisfactory explanation as to how the use of polymers allowed more complex products to be manufactured.
- Q6 (a)**
- (i) Some candidates did not attempt this question, but most of those who did scored at least one of the two marks on offer. Where marks were lost it was generally due to confusion as to what took place during a 'client brief' in terms of it being the start of the design process.
  - (ii) Virtually all candidates attempted this question which was reasonably well answered. Most candidates scored at least one of the two marks on offer and were suitably aware of what takes place when presenting design ideas to a client.
- Q6 (b)** This question was generally well answered with most candidates gaining full marks. Where marks were lost it was generally due to candidates seeing the use of CAD as being simply 'faster' or 'more accurate' than traditional hand drawn draughting.
- Q6 (c)** Although most candidates attempted this question, responses were very mixed. A number of candidates failed to describe how modern technology would be used in the assembly stage of making an engineered product and in many cases were unsure as to how it could be used in marketing the final product.
- Q7** This question was attempted by virtually all candidates with the majority gaining at least three or four of the nine marks on offer. Where marks were lost, this was generally due to some candidates treating materials, components or ingredients as separate questions.
- Q8** Virtually all candidates attempted this question but a large number did not gain more than a few marks due to responses either being too vague or being focused in the wrong areas.

Candidates were required to discuss the effects on the workforce of introducing modern technologies into manufacturing.

Many responses simply referred to possible job losses and failed to recognise the potential for further training and job enhancement. Only a small number of candidates recognised the benefits of introducing robots to carry out potentially hazardous tasks and the upgrading of temperature and climate control – making for a safer and more pleasant environment.

The candidates' Quality of Written Communication (QWC) was assessed during this question and marks were awarded for well written answers despite there being some limitation in technical content.



# **B233 Real World Manufacturing and Making a Manufactured Product**

## **General Comments**

In general, the work provided by centres was well presented and carefully marked and the detailed annotation provided by many Centres was much appreciated by moderators. Where folders were clearly divided into sections, it was easier to determine how the centre had awarded their marks. It is best practice to present folders in this way and centres are urged to encourage candidates to do this.

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Certain words and phrases used within the marking criteria sometimes cause questions to be raised. It is not possible to give precise guidance as to how phrases such as 'wide range' or 'justified' should always be interpreted. The context and type of product being studied must always be taken into account. If the evidence is presented as a simple list with no explanation, then there has clearly been no attempt at justification and the work should not be marked using a criteria block that refers to 'justified'. However, it is important to apply a 'sense check' to the amount of justification that can reasonably be expected for a particular product and this can, of course, vary from one product to another.

### **Comments on Individual sections**

#### **Unit B233 3A**

In Unit B233 3A 'Real World Manufacturing' candidates are required to study the manufacture of a product of their choice selected from the list provided by OCR. References to batch and quantity production should always be related back to the product being studied and high marks should not be awarded when a candidate only provides basic, generic statements about batch production.

#### **Unit B233 3B**

In Unit B233 3B, candidates are required to detail their individual application of health and safety procedures and quality control techniques. Centres are reminded that marks should only be awarded for evidence relating to a candidate's individual application, and generic accounts of quality control or health and safety issues are not sufficient.

In Unit B233 3B 'Making a Manufactured Product', candidates are required to work in teams. It is especially important that the assessment criteria are carefully applied in this Unit. Centres are reminded that some parts of the assessment criteria grid require evidence of the candidate working as part of a team and other parts require evidence of the candidate's individual contribution. These different aspects must be clearly evidenced in the candidate's portfolio and the use of diaries is often found to be an effective way of doing this.

## **B234 Impact of modern technologies on manufacturing**

### **General Comments**

This is a one hour examination paper and requires that candidates have a sound knowledge related to the products and manufacturing environments/sectors that they have studied. Most candidates attempted all of the questions on the paper but, in some cases, there was evidence of candidates not having read questions carefully before answering. It is most important that candidates take time to read through the question paper thoroughly before attempting to answer questions. This is particularly important where questions have a very specific focus and require extended writing in the response, as is the case in the Quality of Written Communication (QWC) question.

Questions that dealt with materials and components were generally well answered, but responses to questions relating to modern technologies were quite disappointing in many cases.

### **Comments on Individual Questions**

- Q1 (a)** This question was attempted by all candidates and was generally well answered. Where marks were lost, this was often due to some uncertainty as to the naming of an appropriate product that is manufactured in their chosen sector and in stating the modern technology used in the manufacture of the product.
- Q1 (b)** In this question, candidates were asked to explain the benefits of the modern technologies used in the manufacture of one of the products that they chose in Q1(a). In general, the question was not well answered, with a significant number of candidates failing to follow up on their responses to part (a)
- Q2 (i)** This question was attempted by all candidates and was generally well answered, with the majority of candidates successfully being able to name a suitable activity that would take place during the assembly stage of a manufactured product.
- (ii)** This question was attempted by all candidates and was generally very well answered. Where marks were lost, this was often due to candidates choosing quality checks as a finishing process.
- (iii)** This question was attempted by all candidates and was generally well answered, with the majority of candidates successfully being able to name a suitable activity that would take place during the packaging stage of a manufactured product.
- Q3 (i)** This question was attempted by virtually all candidates with the majority gaining at least one of the two marks on offer. Where marks were lost, this was generally due to some confusion as to benefits to using automation in hazardous areas.
- (ii)** This question was not well answered with a small number of candidates being unaware of the advantages of buying/selling advertising on the internet in order to improve product availability.

- (iii) This question was not well answered with only a very small number of candidates able to give a satisfactory explanation of how the use of modern technologies impacts on the costs of manufactured products.
- (iv) Although most candidates attempted this question, responses were very disappointing with only a very small number giving viable responses as to the advantages of modern technologies on the transportation of finished products.
- Q4 (a)(i)** This question was attempted by all candidates and was very well answered
- (ii) This question was attempted by virtually all candidates with the majority gaining at least one of the four marks on offer. Where marks were lost, this was generally due to responses either being too vague or being focused purely on speed of production rather than on quality and consistency.
- Q4 (b)** It was somewhat disappointing to see that a significant number of candidates chose not to attempt this question. Where responses were presented, only a very small number of candidates understood the benefits to a manufacturing company of using Computer Integrated manufacture (CIM).
- Q4 (c)** This question was attempted by virtually all candidates with the majority gaining at least one of the three marks on offer. Where marks were lost, this was generally due to candidates' uncertainty as to what comprised 'standardised components.'
- Q5** This question was attempted by all candidates and was generally well answered. Virtually all candidates gained at between one and five marks out of the six available and were able to give a good explanation as to what a manufacturer should consider when introducing new technology into the workplace.
- Q6 (a)(i)** This question was attempted by all candidates and was generally well answered. Virtually all candidates gained at between three and six marks out of the six available. All candidates were well aware of the need to reduce waste and the re-cycling of materials in planning, processing and packaging.
- (ii) &
- (iii)
- Q6 (b)** Some candidates did not attempt this question, but those candidates who did scored at least one of the three marks on offer. Where marks were lost it was generally due to some confusion between the term DFMA and smart materials.
- Q7 (a)** Although most candidates attempted this question, responses were very disappointing with only a small number of candidates giving viable responses as to what constitutes a 'smart material.'
- Q7 (b)** Again, although most candidates attempted this question, responses were again very disappointing with only a small number of candidates giving viable examples of different forms of smart materials and their uses.

**Q8\*** Virtually all candidates attempted this question but a large number did not gain more than a few marks due to responses either being too vague or being focused in the wrong areas.

Candidates were required to discuss and evaluate the effects that introducing modern technologies would have on the finished products.

Many responses simply referred to effects on the workforce in terms of possible job losses and failed to recognise the potential for a safer and cleaner workplace. Only a small number of candidates recognised the benefits of introducing robots to carry out potentially hazardous tasks and the upgrading of production equipment leading to better quality and a more consistent product.

The candidates' Quality of Written Communication (QWC) was assessed during this question and marks were awarded for well written answers despite there being some limitation in technical content.

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