GCSE Computing
J275
Guidance on marking
A452 and A453
October 2015
Contents

General guidance 3
Assessing A452 4
Things to look for in marking A452 5
Assessing A453 6
Marking A453 7

Guidance only

• The guidance is given to support teachers with their awarding of mark bands
• It highlights features and trends to look for
• This is not a definitive document
• Marking is a best-fit approach
• Due to the moderation process, grade boundaries may fluctuate for each Exam Series.

Guidance for J275 Qualification Assessments only.
Adapted and Compiled from Examiner Reports up to 2015.

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General Guidance

Controlled assessment

- The tasks should be the learner’s own work
  - Completed under controlled conditions
  - Without direct teacher input or feedback
  - Without writing frames and templates
  - Without plagiarism.

- Teachers should prepare their learners so that they have relevant skills and understanding to attempt the chosen task.

- Learners may have access to various resources, including the internet, but should acknowledge all source material; it is their additional contribution that is assessed.

- It is the teacher’s responsibility to ensure the work is that of the learner and that no plagiarism has taken place.

- It is important candidates are monitored to ensure they do not download or otherwise introduce and use solutions they have not prepared themselves under supervision.

- Learners must work on their own to produce the solutions; it is not a group exercise.

Malpractice examples

- **Plagiarism:** from the internet or from other learners. However, acknowledged quotes to support work are okay. Similarly, tutorials and other online resources are fine to use, but only if referenced. Learners should clearly identify where code has been modified.

- **Writing frames:** Learners must create their own solutions to the tasks. Writing Frames include ‘tick sheets’ of things to include, or prompt questions that lead learners towards solutions or mark criteria.

- **Non-compliance with instructions:** e.g. using unapproved software.

- **Excessive help:** learners should be prepared by being taught approaches / techniques, but must produce all the submitted material themselves. **Individual feedback** from the teacher after the task taking has commenced is **not allowed**. But, common problems can be addressed to the group by way of general hints and suggestions. Similarly, teaching to the solution beforehand, thus guiding the learner to a solution, is not acceptable.

- **Once the work is submitted:** Teachers may not provide feedback on the work for learners to revisit and modify the work.

  - The work may not be revisited and must be kept securely.
  - Work should be assessed in line with the guidance and the marks submitted at the appropriate time.
Assessing A452

General Guidance

- Be aware that A452 is a research AND a practical unit.
- It is expected that learners will have to find out some new material themselves.
- Some skills may be taught in advance, such as general Little Man Computer programming - but not how to do the live tasks. As mentioned, teaching similar tasks before hand to familiarise students with the task is malpractice.

Approaches

There is no requirement for centres to choose a single task for one cohort. There are benefits and drawbacks to both a common approach and an individual approach.

- **Benefit of a common task**
  - easier to prepare the whole group
  - easier to monitor work
  - easier to mark the work.

- **Drawbacks of a common task**
  - more likely to generate similar work
  - reduces the likelihood of original work - remember, original / clever / unusual / creative solutions are positives.

Presentation of Coursework

- A single narrative document is the most appropriate way to present the work.
- The single document approach demonstrates the learner’s thinking and approach effectively.
- The report is a presentation of the process and their conclusions and there are marks available for the clarity of their approach to the practical investigation.
- A single document also makes marking digital submission much easier.

Practical Investigation Element

- There is evidence of a well-structured practical investigation.
- The evidence supplied is well organised and clearly relevant to the set task.
- There is extensive evidence of individual practical investigation beyond the group activity and any teacher led activity.
- The practical investigation shows clear signs of planning and a structured approach, providing a complete investigation of the set topic area.
- The practical investigation has been carried out with skill and due regard to safety issues.

Assessment

- All of the tasks must be completed for full credit
- Missing work must solicit reduced credit
- Detail is important
  - All the work presented should contain enough detail to convince that the learner has done sufficient research.
  - This should not be lots of unedited material pasted from web sites.
- Lack of referencing is likely to undermine the learner’s ability to show development and analysis of research
- Unreferenced work that is discovered at moderation will be considered malpractice.
Things to look for in marking A452

**Practical Investigation**
- Follows the instructions thoroughly and accurately.
- Documents testing.
- Looks up relevant information to help tackle the tasks – showing initiative and direction.
- Plans where to go for information, with reasons.
- Investigates ways of altering/developing code as relevant to the problem.
- Plans where to go for information, with reasons.
- Experiments with practical task – focuses on the problem. Reports on this.
- Finds out something new.
- Sensible methodology with direction. Reports on strategy.

**Effectiveness and efficiency**
- Final solutions to software developments are to the point – they do what is required without any clumsy ‘bloat’.
- All tasks working.

**Technical understanding**
- Shows understanding of basic programming or other principles.
- Uses naming conventions where appropriate.
- Shows understanding of alternative approaches/programming environment, with examples as appropriate.
- Comments on practical use in the real world of software development.
- Confident and extensive use of technical terms.
- Gives a feeling that the learner really knows the technical issues that underpin the scenario and importantly – goes beyond it.

**Testing, evaluation and conclusions**
- Honest appraisal of final solutions.
- In particular, look to see if the last question shows knowledge of an alternative approach to the task with detailed reasons given, as appropriate.
- Reasonably extensive.
- Not a vague ‘general knowledge’ type approach.
- Detail!
- Knowledge about programming or other techniques beyond the scenario.
- Names organisations, methods, approaches, principles.
- Fluent accurate writing.
- Well organised.

**And finally . . .**
- Attempts must be made of ALL of the sub tasks required. If anything is left out, marks must be capped accordingly.
Assessing A453

The assessment of A453 is based on a best-fit approach allocating the most appropriate mark by matching the work seen for the three tasks to the descriptors.

Use of programming techniques
This mark group is about attempting the tasks; if the learner has made a decent attempt at all of the tasks using a suitable range of techniques then they should be placed in the top band.

In general if only one task is attempted all mark blocks are restricted to the lower category, for two attempts, the middle block and for marks in the top block all three tasks must be attempted.

Efficient use of programming techniques
This mark group is about the effective and efficient use of coding techniques. For work in the top band ALL of the solutions should work and techniques should be used appropriately and efficiently.

For example a sequential approach when an iterative approach would be more effective would limit the marks for this section.

Design
This block should contain all the design elements including a detailed analysis of the problem to identify the success criteria for the solution. Working solutions should not fall over easily so some validation will be required.

We expect testing throughout the development process so a suitable test strategy with appropriate test data should be identified.

The design should be presented as an algorithm either as a flowchart or as pseudocode, preferably in both formats.

Once again marks are limited to band one for only one completed task and band two if only two are completed.

Development
This is the story of the development and should show how the solutions were taken from design to finished product using an iterative approach. The whole report should take a narrative style explaining stage by stage how the products were developed and tested.

Testing
Most of the test evidence should be generated as part of the development process.

The design success criteria and test strategy form the basis for this testing which will be evidenced as part of the narrative.

Some post development testing and third party destructive testing may also be necessary to fully test the products.

Where third party testing takes place, it is important that only the learner’s work is credited.

Feedback from this testing will feed back into the evaluation and learners may well find time to ‘fix’ any problems that are identified in this part of the process before going on the evaluate the solution against the original requirements and success criteria.

This section is used to test the quality of written communication, which may help determine the mark point in the appropriate band.
Marking A453

Use of programming techniques

This mark group is about attempting the tasks. If the learner has made a decent attempt at all of the tasks using a suitable range of techniques then they should be placed in the top band.

<table>
<thead>
<tr>
<th>This block is intended to reward realistic attempts at the tasks. It is a feature of the assessment that to move beyond the first mark band, two tasks must have been attempted; to move to the third band all three must have been attempted.</th>
<th>0-2 marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typically this will be a learner who has only made a reasonable attempt at one task. There may be elements for a second or third task but these will not lead to any code that could be identified as a partially working solution to these.</td>
<td>3-4 marks</td>
</tr>
<tr>
<td>There must be two working solution for 4 marks. One of the solutions may only be partially successful but can be interpreted as a realistic attempt at a second task for 3 marks.</td>
<td>5-6 marks</td>
</tr>
<tr>
<td>If there is a reasonable attempt at all three tasks then 5 or 6 is appropriate. For 6 marks we would expect all three solutions to work, for 5 two will work fully and the third partially.</td>
<td></td>
</tr>
</tbody>
</table>

Efficient use of programming techniques

This mark group is about the effective and efficient use of coding techniques. For work in the top band ALL of the solutions should work and techniques should be used appropriately and efficiently.

For example a sequential approach when an iterative approach would be more effective would limit the marks for this section.

<table>
<thead>
<tr>
<th>This block is intended to reward the quality of the finished products. If only one or two tasks have been attempted then the marks will be restricted to the first or second band accordingly, however good the programming is.</th>
<th>0-4 marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks in this band will reflect a series of partial solutions not fully solving the original problem or one fully working solution only.</td>
<td>5-8 marks</td>
</tr>
<tr>
<td>For marks in this band, learners should be providing working solutions to all three tasks or efficient solutions to two tasks. If all three tasks have been attempted the solutions may well include some inefficiencies such as use of unsuitable variable names or multiple variables when an array would be more appropriate or possibly hard coded data when a file may be more appropriate.</td>
<td>9-12 marks</td>
</tr>
<tr>
<td>In this band there must be working solutions for all three tasks and these need to be reasonably efficient. For 9 marks we would expect to see at least two of the solutions with few missing features or minor inefficiencies and, for 12 marks, there should be no obvious inefficiencies in the code for all three tasks.</td>
<td></td>
</tr>
</tbody>
</table>
Design
This mark group is about the quality of the design. For the top band marks there should be:
• A detailed analysis of the problem including any validation
• Detailed algorithms describing the solution
• Suitable success criteria
• A test strategy with suitable test data identified for use during development.

This block should contain all the design elements including a detailed analysis of the problem to identify the success criteria for the solution.

Working solutions should not fall over easily so some validation will be required.

We expect testing throughout the development process so a suitable test strategy with appropriate test data should be identified.

The design should be presented as an algorithm either as a flowchart or as pseudocode, preferably in both formats.

Once again marks are limited to band one for only one completed tasks and band two if only two are completed.

<table>
<thead>
<tr>
<th>0-3 marks</th>
<th>In this band there will be some evidence of planning but this will be largely superficial.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6 marks</td>
<td>To achieve marks in this band there must be evidence of some analysis, some thought given to validation and a set of algorithms. The algorithms will define the solution in general terms but may lack detail or may be in sufficient detail for one or two of the tasks only. Pseudocode that is reverse engineered code should not be accepted. There will be some indication of how the solutions will be tested but this may lack detail for all or some of the tasks.</td>
</tr>
<tr>
<td>7-9 marks</td>
<td>For marks in this band the design must be complete for all three tasks. A good rule of thumb is that the design is capable of being given to another programmer to complete the tasks and expect a similar solution without further analysis and design.</td>
</tr>
</tbody>
</table>

Development
This mark group is about the story of the development process. Learners need to show the process including:
• Systematic testing during development
• The code needs to be annotated
• Meaningful variable names should be used
• The code needs to be explained indicating the function of each section.

This is the story of the development and should show how the solutions were taken from design to finished product using an iterative approach. The whole report should take a narrative style explaining stage by stage how the products were developed and tested.

<table>
<thead>
<tr>
<th>0-3 marks</th>
<th>In this band there will be some evidence of a solution but with little explanation of the process. For a single attempt this may well be a detailed explanation of how one solution was achieved.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-6 marks</td>
<td>For marks in this band there will be good evidence of development. There will be annotated code and some explanation of how this was tested during development. There must be sensible variable names but there will be some gaps in the explanation and missing evidence of testing for some sections.</td>
</tr>
<tr>
<td>7-9 marks</td>
<td>To achieve marks in the top band there must be clear evidence of iterative development for all three tasks. Fully explained code and evidence of testing at various key stages, with any remedial actions fully documented. Meaningful variable names and fully annotated code will be provided alongside the other evidence.</td>
</tr>
</tbody>
</table>
Testing

- This mark group is about the testing and evaluation of the product
- Testing should have been completed during development
- Some post development testing should be completed
- End user testing needs to be completed and feedback supplied
- The evaluation of the product should use all the evidence from testing and cross reference these to the success criteria defined in the design section to establish the success or otherwise of the solution.
- Learners may identify weaknesses and recommend how these might be dealt with, or even fix these, knowing about them is what is most important.

<table>
<thead>
<tr>
<th>Marks</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 marks</td>
<td>There will be some evidence of tests being completed but these will be limited in scope and probably mostly completed post development. If marking a single attempt then we would expect to see evidence of testing during development. Evaluation may well be limited to generic comments on the solution.</td>
</tr>
<tr>
<td>4-6 marks</td>
<td>There will be evidence of testing during development but this may be limited in scope with much of the testing being post development. There must be evidence of the test results available in the report, simply stating that the product was tested will not be sufficient for this mark band. Testing in this band is likely to focus on showing that the solution worked with little attempt to 'break it'. Evaluations will refer to the test evidence and attempt to explain how the solution meets the requirements.</td>
</tr>
<tr>
<td>7-9 marks</td>
<td>There will be clear evidence of testing for all three tasks during development, fully explained and linked to the success criteria and test strategy. Testing will be extensive and clearly attempt to find flaws in the solution. The evaluation will link the test evidence and the success criteria to evaluate how well the solution matches the requirements.</td>
</tr>
</tbody>
</table>

Most of the test evidence should be generated as part of the development process.

The design success criteria and test strategy form the basis for this testing which will be evidenced as part of the narrative.

Some post development testing may also be necessary to fully test the products including third party testing by other learners.

Feedback from this testing will feed back into the evaluation and learners may well find time to 'fix' any problems that are identified in this part of the process before going on to evaluate the solution against the original requirements and success criteria.

This section is used to test the quality of written communication, which may help determine the mark point in the appropriate band.
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