OCR
Oxford Cambridge and RSA

# Science

## OCR J815 Unit R073 Level 1/Level 2
## Cambridge Nationals Certificate in Science
## Unit Recording Sheet

Please read the instructions printed at the end of this form. **One** of these sheets, suitably completed, should be attached to the assessed work of **each** candidate.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Unit Title** | **How scientists test their ideas** | **Unit Code** | **R073** | **Session** | Jan / June | **Year** | | | | |
| **Centre Name** | | | | | **Centre Number** | | | | | |
| **Candidate Name** | | | | | **Candidate Number** | | | | | |

| **Criteria** | | | **Teacher Comments** | **Mark** | **Page No** |
|---|---|---|---|---|---|
| **LO1: Be able to plan a scientific investigation** | | | | | |
| **MB1: 1 – 6 marks** | **MB2: 7 – 11 marks** | **MB3: 12 – 15 marks** | | | |
| • **Limited** plan includes equipment and techniques to be used<br>• Plan provides a 'fair test'<br>• Identifies how **some** errors will be minimised<br>• **Some** sources of secondary data/information identified<br>**[1 2 3 4 5 6]** | • Plan gives **sufficient detail** for investigation to be repeated, including choices of:<br>o equipment, including instrumentation<br>o range and number of data points<br>o number of replicates<br>o control of variables<br>to result in the collection of data of an appropriate quality<br>• **Some** explanation of how errors will be minimised<br>• **Range** of **relevant** sources of secondary data/information identified<br>**[7 8 9 10 11]** | • **Comprehensive** plan shows scientific understanding in making appropriate choices of:<br>o equipment, including instrumentation<br>o range and number of data points<br>o number of replicates<br>o control of variables<br>to result in the collection of accurate data to address the scientific problem<br>• **Detailed** explanation of:<br>o how errors will be minimised<br>o variables which cannot be controlled<br>• **Wide range** of **relevant** sources of secondary data/information identified and selection of **appropriate** sources justified<br>**[12 13 14 15]** | | | |

| Criteria | | | Teacher Comments | Mark | Page No |
|---|---|---|---|---|---|
| **LO2: Be able to collect scientific data** | | | | | |
| **MB1: 1 – 4 marks** | **MB2: 5 – 7 marks** | **MB3: 8 – 10 marks** | | | |
| • **Basic** understanding of risks in procedures with only standard laboratory safety precautions identified<br>• **Significant** teacher intervention required to ensure safety **or** help set up equipment<br>• Results recorded **clearly**<br>**[1 2 3 4]** | • **Some** risks in procedures identified and **some** specific responses suggested to reduce risks<br>• **Most** risks managed successfully with no significant incidents or accidents and no requirement for teacher intervention<br>• **Little support** required to set up equipment<br>• Results tabulated to include all data collected, including use of correct headings<br>**[5 6 7]** | • All significant risks in the plan **evaluated** and **reasoned** judgements made to reduce risks by use of **appropriate** specific responses<br>• All risks managed successfully with no incidents or accidents and no requirement for teacher intervention<br>• Measurements taken and recorded to appropriate accuracy and precision using an appropriate format, including use of correct units<br>**[8 9 10]** | | | |
| **LO3: Be able to analyse scientific information** | | | | | |
| **MB1: 1 – 5 marks** | **MB2: 6 – 9 marks** | **MB3: 10 – 13 marks** | | | |
| • **Some** evidence of processing of quantitative data:<br>o data presented as **simple** charts or graphs<br>o use of a **simple** mathematical technique where appropriate<br>• **Some** trends/patterns in the data identified<br>**[1 2 3 4 5]** | • Graphical and mathematical techniques used to reveal patterns in data:<br>o charts or graphs used to display data in an **appropriate** way<br>o correct use of simple mathematical techniques where appropriate<br>o **appropriate qualitative** treatment of the levels of uncertainty in the data, including identification of any anomalous results<br>• Main trends/patterns in the data **described** with reference to quantitative data<br>**[6 7 8 9]** | • **Appropriate** graphical and mathematical techniques used to reveal patterns in data:<br>o **appropriate** scales and axes used in graphs and data plotted **accurately**, including where **appropriate**, use of lines of best fit<br>o correct use of complex mathematical techniques where **appropriate**<br>o **appropriate** quantitative treatment of levels of uncertainty in the data<br>• Main trends/patterns in the data described in detail and interpreted correctly with reference to quantitative data and **relevant** scientific understanding<br>**[10 11 12 13]** | | | |

<table>
<tr><th colspan="3">Criteria</th><th>Teacher Comments</th><th>Mark</th><th>Page No.</th></tr>
<tr><td colspan="3">LO4: Be able to evaluate scientific information</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>MB1: 1 – 5 marks</td><td>MB2: 6 – 9 marks</td><td>MB3: 10 – 13 marks</td></tr>
<tr><td>• Limited comments made about the quality of the data and the methods used<br>• Simple conclusion given which is consistent with the data collected and shows limited scientific understanding<br>• There is limited application of skills/knowledge/understanding from other units in the specification<br>[1 2 3 4 5]</td><td>• Some relevant comments made about the quality of the data including accuracy and sources of error, linked to the methods of collection:<br>o limitations in the methods of data collection identified and suggestions for improvements given<br>• Conclusion given and justified based on an analysis of the data, showing sound understanding of the underlying science<br>• Applies skills / knowledge / understanding from other units in the specification in a way which is mostly relevant<br>[6 7 8 9]</td><td>• Detailed and critical consideration given to the data and methods used to obtain them:<br>o sources of error and quality of data discussed and explained, including accuracy, repeatability and uncertainty<br>o limitations of the method identified and suggestions for improvements justified<br>• Conclusion given and justified based on critical analysis of primary and secondary data, clearly linked to relevant scientific understanding<br>o identification of conflicting evidence<br>o what further evidence is needed to make the conclusion more secure<br>• Applies skills / knowledge / understanding from other units in the specification in an effective relevant way<br>[10 11 12 13]</td></tr>
<tr><td colspan="3">LO5: Be able to communicate scientific information</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td>MB1: 1 – 4 marks</td><td>MB2: 5 – 7 marks</td><td>MB3: 8 – 9 marks</td></tr>
<tr><td>• Limited use of scientific, technical and mathematical language, conventions and symbols<br>• Some errors in grammar, punctuation and spelling<br>• Limited use of diagrams, graphs, flow charts and pictures<br>[1 2 3 4]</td><td>• Information is presented in a structured format<br>• Sound use of scientific, technical and mathematical language, conventions and symbols<br>• Occasional errors in grammar, punctuation and spelling<br>• Some appropriate use of diagrams, graphs, flow charts and pictures<br>[5 6 7]</td><td>• Information presented is clear, well organised and structured, and in a coherent format<br>• Scientific, technical and mathematical language, conventions and symbols are used effectively<br>• Few, if any, errors in grammar, punctuation and spelling<br>• Diagrams, graphs, flow charts and pictures are used appropriately and accurately<br>[8 9]</td></tr>
<tr><td colspan="3"></td><td>Total/60</td><td></td><td></td></tr>
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| If this is a re-sit, please tick | | Session and Year of previous submission | Jan / June | 2 | 0 | | | Please tick to indicate this work has been standardised internally | |
|---|---|---|---|---|---|---|---|---|---|

Please note: This form may be updated on an annual basis. The current version of this form will be available on the OCR website (www.ocr.org.uk).

## Guidance on Completion of this Form

1 **One** sheet should be used for each candidate.
2 Please ensure that the appropriate boxes at the top of the form are completed.
3 Please enter *specific* page numbers where evidence can be found in the portfolio, and where possible, indicate to which part of the text in the mark band the evidence relates.
4 Circle the mark awarded for each strand of the marking criteria in the appropriate box and also enter the circled mark in the final column.
5 Add the marks for the strands together to give a total out of 60. Enter this total in the relevant box.