**Instrument-specific marking guide (IA3): Research investigation (20%)**

**Student name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The following table summarises the criteria, assessment objectives and mark allocation for the research investigation.

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| --- | --- | --- |
| **Criterion** | **Objectives** | **Marks** |
| Research and planning | 2, 5 | **/ 6** |
| Analysis and interpretation | 3, 4 | **/ 6** |
| Conclusion and evaluation | 4, 6 | **/ 6** |
| Communication | 7 | **/ 2** |
| **Total** | **20** |

# Criterion: Communication

## Assessment objectives

7. communicate understandings and research findings, arguments and conclusions about the properties and structure of organic materials or chemical synthesis and design

|  |  |
| --- | --- |
| **The student work has the following characteristics:**  | **Marks**  |
| • effective communication of understandings and research findings, arguments and conclusions about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **fluent and concise use of scientific language and representations**
* **appropriate use of genre conventions**
* **acknowledgment of sources of information through appropriate use of referencing conventions**.
 | 2  |
| • adequate communication of understandings and research findings, arguments and conclusions about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **competent use of scientific language and representations**
* **use of basic genre conventions**
* **use of basic referencing conventions.**
 | 1  |
| • **does not satisfy any of the descriptors above**.  | 0  |
| COMMENT: |

# Criterion: Research and planning

## Assessment objectives

2. apply understanding of the properties and structure of organic materials or chemical synthesis and design to develop research questions

5. investigate phenomena associated with the properties and structure of organic materials or chemical synthesis and design through research

|  |  |
| --- | --- |
| **The student work has the following characteristics:**  | **Marks**  |
| * informed application of understanding of the properties and structure of organic materials or chemical synthesis and design demonstrated by a
* **considered rationale identifying clear development of the research question from the claim**
* effective and efficient investigation of phenomena associated with the properties and structure of organic materials or chemical synthesis and design demonstrated by a
* **specific and relevant research question**

**- selection of sufficient and relevant sources.**  | 5–6  |
| * adequate application of understanding of the properties and structure of organic materials or chemical synthesis and design demonstrated by a
* **reasonable rationale that links the research question and the claim**
* effective investigation of phenomena associated with the properties and structure of organic materials or chemical synthesis and design demonstrated by a
* **relevant research question**

**- selection of relevant sources.**  | 3–4  |
| * rudimentary application of understanding of the properties and structure of organic materials or chemical synthesis and design demonstrated by a
* **vague or irrelevant rationale for the investigation**
* ineffective investigation of phenomena associated with the properties and structure of organic materials or chemical synthesis and design demonstrated by

**- an inappropriate research question** **- a selection of insufficient and irrelevant sources**.  | 1–2  |
| • **does not satisfy any of the descriptors above.**  | 0  |
| COMMENT: |

# Criterion: Analysis and interpretation

## Assessment objectives

1. analyse research evidence about the properties and structure of organic materials or chemical synthesis and design
2. interpret research evidence about the properties and structure of organic materials or chemical synthesis and design

|  |  |
| --- | --- |
| **The student work has the following characteristics:**  | **Marks**  |
| • systematic and effective analysis of qualitative data and/or quantitative data within the sources about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **the identification of sufficient and relevant evidence**
* **thorough identification of relevant trends, patterns or relationships**
* **thorough and appropriate identification of limitations of evidence**

• insightful interpretation of research evidence about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **justified scientific argument/s.**
 | 5–6  |
| • effective analysis of qualitative data and/or quantitative data within the sources about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **the identification of relevant evidence**
* **identification of obvious trends, patterns or relationships**
* **basic identification of limitations of evidence**

• adequate interpretation of research evidence about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **reasonable scientific argument/s.**
 | 3–4  |
| • rudimentary analysis of qualitative data and/or quantitative data within the sources about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **the identification of insufficient and irrelevant evidence**
* **identification of incorrect or irrelevant trends, patterns or relationships**
* **incorrect or insufficient identification of limitations of evidence**

• invalid interpretation of research evidence about the properties and structure of organic materials or chemical synthesis and design demonstrated by * **inappropriate or irrelevant argument/s**.
 | 1–2  |
| • **does not satisfy any of the descriptors above**.  | 0  |
| COMMENT: |

**Criterion: Conclusion and evaluation**

## Assessment objectives

4. interpret research evidence about the properties and structure of organic materials or chemical synthesis and design

6. evaluate research processes, claims and conclusions about the properties and structure of organic materials or chemical synthesis and design

|  |  |
| --- | --- |
| **The student work has the following characteristics:**  | **Marks**  |
| * insightful interpretation of research evidence about the properties and structure of organic materials or chemical synthesis and design demonstrated by
* **justified conclusion/s linked to the research question**
* critical evaluation of the research processes, claims and conclusions about the properties and structure of organic materials or chemical synthesis and design demonstrated by
* **insightful discussion of the quality of evidence**
* **extrapolation of credible findings of the research to the claim**
* **suggested improvements and extensions to the investigation that are considered and relevant to the claim.**
 | 5–6  |
| * adequate interpretation of research evidence about the properties and structure of organic materials or chemical synthesis and design demonstrated by
* **reasonable conclusion/s relevant to the research question**
* basic evaluation of the research processes, claims and conclusions about the properties and structure of organic materials or chemical synthesis and design demonstrated by
* **reasonable description of the quality of evidence**
* **application of relevant findings of the research to the claim**
* **suggested improvements and extensions to the investigation that are relevant to the claim.**
 | 3–4  |
| * invalid interpretation of research evidence about the properties and structure of organic materials or chemical synthesis and design demonstrated by
* **inappropriate or irrelevant conclusion/s**
* superficial evaluation of the research processes, claims and conclusions about the properties and structure of organic materials or chemical synthesis and design demonstrated by
* **cursory or simplistic statements about the quality of evidence**
* **application of insufficient or inappropriate findings of the research to the claim**
* **ineffective or irrelevant suggestions.**
 | 1–2  |
| • **does not satisfy any of the descriptors above**.  | 0  |
| COMMENT: |