**Science RESEARCH INVESTIGATION SCAFFOLD**

*This scaffold provides guidance on the structure and content of the Research Investigation. All points are extrapolated from the ISMG and bolded words reflect the evidence requiring demonstration for the top-level descriptors of each criterion. Use this guide as a checklist to ensure you have included every aspect of the essay.*

Claim

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| Checklist | Advice notes |
| * Restate the claim you have chosen, exactly as it is presented on the Task Sheet
 | Students can develop their own claim in consultation with their teacher, but it must be derived from Unit 4 subject matter. |

RATIONALE (~300-400 words)

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| Checklist | Advice notes |
| * Summarise the preliminary research available on the claim and related concepts from Unit 4.
* Discuss any missing details/questions/gaps in current research that illuminate specific variables for further investigation, and why these are worthy of study.
* Highlight a broad research question that could be investigated
* Sequence and describe how 2-3 key data sets were used in decisions to develop a more specific research question from the claim.
 | * It must be clear that there are sufficient valid sources allow you to **effectively** and **efficiently** **investigate** the claim.
* It must be made clear how the research question was developed from the claim.
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RESEARCH QUESTION

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| Checklist | Advice notes |
| * Clearly state your finalised **specific** and **relevant** research question here (including specific variables)
 | * It must be clear that the research question has come from the claim and the Unit 4 topic.
* The research question should allow you to find a small number of related data sets and allow you to **effectively** and **efficiently** **investigate** the claim
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ANALYSIS AND INTERPRETATION OF EVIDENCE (~500-600 words)

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| Checklist | Advice notes |
| * Introduce two - three key data sets (mostly quantitative and preferably from 2-3 separate sources), **by briefly outlining the aim and methodology for each**.
* For each data set any **relevant** **trends, patterns and/or relationships** must be **thoroughly identified and named.**
* For each data set **thoroughly identify any significant limitations,** such as:
	+ Weak points in the data with respect to the research question
	+ Methodological limitations impacting reliability and validity of the conclusion drawn (accuracy & repeatability)
	+ Problems with the use of secondary data in trying to answer your research question (repurposed data)
* Discuss how the limitations may affect the reliability and validity of the trends, patterns and/or relationships previously identified, and therefore your ability to effectively answer the research question and support the original claim (or parts of it)
* Use the trends, patterns and/or relationships (considering their limitations) to build a series of scientific arguments and supporting evidence to answer the RQ.
 | * You may like to discuss each data set separately or collectively. You may also like to make comparisons between the data sets if it is appropriate to do so.
* Data sets could be presented in either of two ways: copy and paste an existing data set and highlight the relevant data to be analysed (not all data within the data set need be used) OR collate **relevant** data from a source into a single table or graph.
* Throughout your research process, you will use a Research Retrieval Chart to analyse and evaluate your data sets.
* Each data set should be based on the identified variables and therefore help to **effectively** answer the research question.
* Look at the Results, Discussion and Conclusion sections of each source to find limitations already discussed by the author/s
* Justify these scientific arguments using Unit 4 concept/s.
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EVALUATION (~300 words)

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| Checklist | Advice notes |
| * **Select the 2-4 most significant limitations** of the evidence previously identified (including repurposing of the data) to discuss how well the evidence answers the RQ and the extent to which they influence the validity of the conclusion.
 | * If you have sufficient and relevant sources then limitations of one set of evidence may be mitigated by strengths of another to allow a valid, reliable conclusion to be drawn; however, you need to explain this. If the limitations of evidence constrain or undermine the conclusion this should be acknowledged and explained.
* You can also look for common strengths and limitations between datasets and discuss how they collectively impact the conclusion and extrapolation of findings to the claim
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CONCLUSION (~150 words)

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| Checklist | Advice notes |
| * Clearly state the answer to the RQ (do not need to repeat RQ).
* **Justify** this answer by outlining the scientific arguments (developed in the Interpretation) and supporting evidence, including the quality of said evidence.
* Carefully consider the evidence and conclusion and explain whether it can successfully be **extrapolated** to the claim, with clear reasons given as to why the claim can or cannot be supported in this case (considering the nature of the conclusion).
 | * A conclusion should be able to be drawn with sufficient evidence, but may be deemed ‘inconclusive’ due to the identified limitations (this must be clearly justified)
* **There is no need to restate the RQ/evidence/data in the conclusion.**
* Remember that the RQ is a very narrow view of the claim – what are the implications of this?
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IMPROVEMENTS/EXTENSIONS (~300 words)

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| Checklist | Advice notes |
| * **Suggest improvements** for modifications to the investigation (based on identified limitations) in order to obtain more valid evidence for the RQ and claim and why/how these would improve the quality of the evidence/investigation.
* **Suggest extensions** for other research to further examine and/or support the claim, provide new data or new research to support the claim, or that help to more meaningfully connect the research question and the claim.
* Explain how the evidence you found may have given you a new insight into the claim
 | * Further evidence will need to be found to support the claim and only aspects can be supported/partially supported. Use this to guide the discussion of extensions for partially or fully supporting the claim in the next section.
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REFERENCE LIST

* Use full references in **correct** APA 6th or 7th edition format
* References must be sequenced in alphabetical order of the (first) author’s surname

COMMUNICATION CRITERION (this is not to be included as a section of your report!)

* Use **scientific** language throughout your essay
* Carefully check your spelling, grammar, punctuation, sentence structure and paragraph flow – read your work aloud to yourself and get someone else to read through it also to ensure that it is **fluent** and easy to understand
* Check your writing to ensure that it is **concise** and not repetitive
* Check your tables/graphs/images to ensure that they include all appropriate conventions and correct referencing of sources.
* Check all in-text citations to ensure **correct APA 6th or 7th edition referencing format** has been used consistently. In-text references go at the end of the sentence they relate to and before the full stop. If referencing a whole paragraph with one citation, only include it once at the end of the paragraph.
* Complete and report a word count that is no more than 2000 words (there is no buffer!)