|  |  |
| --- | --- |
|  | **STAGE 2 – Scientific Studies (STEM)** |
| Task TitleIndividual Inquiry – Factors Impacting Wind Turbine Design |
| TeacherMr Loader | Year LevelYear 12 (Stage 2) | Due Date |



# Task Introduction

South Australia is global leader when it comes to renewable power generation. For many years the majority of our electricity generation has come from renewable resources. By far the largest contributor to this has been wind power. In the Port Augusta region we have had wind turbines installed at the Port Augusta Renewable Energy Park, and also at Lincoln Gap.

Have completed the design proposal, and having received feedback about the design it is time to reflect on the feedback, make changes where required, conduct the investigation to collect data and report on the findings.

This individual inquiry is your external assessment for this subject and therefore will not be marked by your teacher. Therefore they will not directly see the work you put into this investigation in class. You need to make sure that your task has been documented clearly enough, and in sufficient detail.

# Task Requirements

In this task you will present an individual report that summarises the proposal, identifies any modifications made to the procedure as a result of feedback from the teacher, analyses the data obtained, and evaluates the method or model(s) used. If the results are unexpected, you will discuss the reasons for these results as part of your evaluation.

The individual inquiry has two parts:

* the practical investigation
* a practical report of the findings of the investigation.

The report must include:

* introduction, providing the basis for the investigation
* either a hypothesis with variables, or a solution using an engineering design process
* summary of the design of the investigation or model(s)
* results of the practical investigation and analysis of the results, including identification of trends and linking results to relevant discipline knowledge
* evaluation of the method/model(s) used
* identification of sources of uncertainty
* conclusion with justification and consideration of the limitations of the investigation
* citations and referencing.

# Assessment Conditions

* The word limit is 1500 words (if written) or 9 minutes if in oral form (or equivalent in multimodal form). Only the following sections of the report are included in the word count
	+ Introduction
	+ Analysis of results
	+ Evaluation of procedures
	+ Conclusion and justification
* **The final report will be submitted electronically**. You must submit your full report electronically using the following naming protocol:

*SACE registration number-2STU20-AT3-Individual Inquiry*

* If you are doing an oral presentation it will be necessary to record it for assessment and moderation.

# Performance Standards for Stage 2 Scientific studies 2023

| - | Investigation, Analysis, and Evaluation | Knowledge and Application |
| --- | --- | --- |
| A | Critically deconstructs a problem and designs a logical, coherent, and detailed scientific investigation, using a scientific method and/or engineering design process.Obtains, records, and represents data, using appropriate procedures, conventions, and formats accurately and highly effectively.Systematically analyses and interprets data and evidence to formulate logical conclusions with detailed justification.Critically and logically evaluates procedures and their effect on data.Critically and perceptively evaluates the effectiveness of collaboration and its impact on results/outcomes. | Demonstrates deep and broad knowledge and understanding of a range of science inquiry skills and scientific concepts.Applies science inquiry skills and scientific concepts highly effectively in new and familiar contexts.Critically explores and understands in depth the interaction between science and society.Communicates knowledge and understanding of scientific concepts coherently, with highly effective use of appropriate terms, conventions, and representations. |
| B | Logically deconstructs a problem and designs a well-considered and clear scientific investigation, using a scientific method and/or engineering design process.Obtains, records, and represents data, using appropriate procedures, conventions, and formats mostly accurately and effectively.Logically analyses and interprets data and evidence to formulate suitable conclusions with reasonable justification.Logically evaluates procedures and their effect on data.Critically evaluates the effectiveness of collaboration and its impact on results/outcomes. | Demonstrates some depth and breadth of knowledge and understanding of a range of science inquiry skills and scientific concepts.Applies science inquiry skills and scientific concepts mostly effectively in new and familiar contexts.Logically explores and understands in some depth the interaction between science and society.Communicates knowledge and understanding of scientific concepts, with mostly coherent and effective use of appropriate terms, conventions, and representations. |
| C | Deconstructs a problem and designs a considered and generally clear scientific investigation, using a scientific method and/or engineering design process.Obtains, records, and represents data, using generally appropriate procedures, conventions, and formats, with some errors but generally accurately and effectively.Undertakes some analysis and interpretation of data and evidence to formulate generally appropriate conclusions with some justification.Evaluates procedures and some of their effect on data.Evaluates the effectiveness of collaboration and its impact on results/outcomes. | Demonstrates knowledge and understanding of a general range of science inquiry skills and scientific concepts.Applies science inquiry skills and scientific concepts generally effectively in new or familiar contexts.Explores and understands aspects of the interaction between science and society.Communicates knowledge and understanding of scientific concepts, with generally effective use of appropriate terms, conventions, and representations. |
| D | Prepares a basic deconstruction of a problem and an outline of a scientific investigation using a scientific method and/or engineering design process.Obtains, records, and represents data, using procedures, conventions, and formats inconsistently, with occasional accuracy and effectiveness.Describes data and undertakes some basic interpretation to formulate a basic conclusion.Attempts to evaluate procedures or suggest an effect on data.Attempts to evaluate the effectiveness of collaboration and its impact on results/outcomes. | Demonstrates some basic knowledge and partial understanding of science inquiry skills and scientific concepts.Applies some science inquiry skills and understanding of scientific concepts in familiar contexts. Partially explores and recognises aspects of the interaction between science and society.Communicates basic scientific information, using some appropriate terms, conventions, and/or representations. |
| E | Attempts a simple deconstruction of a problem and a procedure for a scientific investigation, using a scientific method and/or engineering design process.Attempts to use some procedures and record and represent some data, with limited accuracy or effectiveness.Attempts to describe results and/or interpret data to formulate a basic conclusion.Acknowledges that procedures affect data.Acknowledges the effectiveness of collaboration and its impact on results/outcomes. | Demonstrates limited recognition and awareness of science inquiry skills and/or scientific concepts.Attempts to apply science inquiry skills and understanding of scientific concepts in familiar contexts.Attempts to explore and identify an aspect of the interaction between science and society.Attempts to communicate information about science. |