



# ORANGE HIGH SCHOOL

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## ASSESSMENT TASK NOTIFICATION

<b>Subject</b>	Earth and Environmental Science
<b>Topic</b>	Module 7 Climate Science
<b>Class Teacher</b>	J Mansur
<b>Head Teacher</b>	A Routh
<b>Year</b>	12
<b>Date Given</b>	Week 3 Term 1
<b>Date Due</b>	Week 5 Term 1 Thursday 24 <sup>th</sup> February 2022
<b>Weighting</b>	35%

### Assessment Outline

**Research Investigation:** 60 mins under exam conditions; comprised of two parts

**Part 1 (27 marks):** You will create a summary report that will be completed outside class (1 period will be allocated in class). The summary report will be no longer than 2 double sided A4 sheets. Additionally, you will complete 2 extended response questions. The summary and 2 questions will be handed in at the competition of Part 2.

**Part 2 (33 marks):** You will answer structured questions in class under examination conditions using the information you have gathered in Part 1.

### Non-completion of Task:

If you know you are going to be away on the day that the task is due, you must make alternative arrangements with your teacher beforehand. If you are suddenly away on the day that the task is due, you must contact your teacher or Head Teacher on your return to school. Documentation will be required in both cases.

### Plagiarism:

Plagiarism, the using of the work of others without acknowledgement will incur serious penalties and may result in zero award. Any cheating will also incur penalties.

**Failure to follow the above procedures may result in a zero award.**

**The policies and procedures that are outlined on the ROSA booklet will be followed regarding the non-completion of assessment tasks.**

### Outcomes Assessed

<b>Outcomes</b>	<b>A student:</b>
EES 12-3	Conducts investigations to collect valid and reliable primary and secondary data and information
EES 12-4	Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
EES 12-5	Analyses and evaluates primary and secondary data and information
EES 12-14	Analyses the natural processes and human influences on the Earth, including the scientific evidence for changes in climate

Task Details: You will need to:

### Part 1 (27 marks)

You will create a summary report that will be completed outside class (1 period will be allocated in class). The summary report will be no longer than 2 double sided A4 sheets. Additionally, you will complete 2 extended response questions. The summary and 2 questions will be handed in at the competition of Part 2.

### Part 2 (33 marks)

You will answer structured questions in class under examination conditions using the information you have gathered in Part 1.

*You are to complete research in and out of class time in the following areas:*

#### **1. Inquiry question: How long does it take for the climate to change naturally and what causes these changes?**

- use modelling to explain the causes of the natural greenhouse effect and examine the timescales in which changes occur
- using secondary sources, assess the different causes of natural climate variation and the timescales in which changes occur, including:
  - the plate tectonic supercycle
  - massive volcanic eruptions, in the Deccan and Siberian Traps
  - changes in the Earth's orbit around the Sun
  - changes in ocean currents and ocean circulation

#### **2. Inquiry question: What scientific evidence is there of climate variations in the past?**

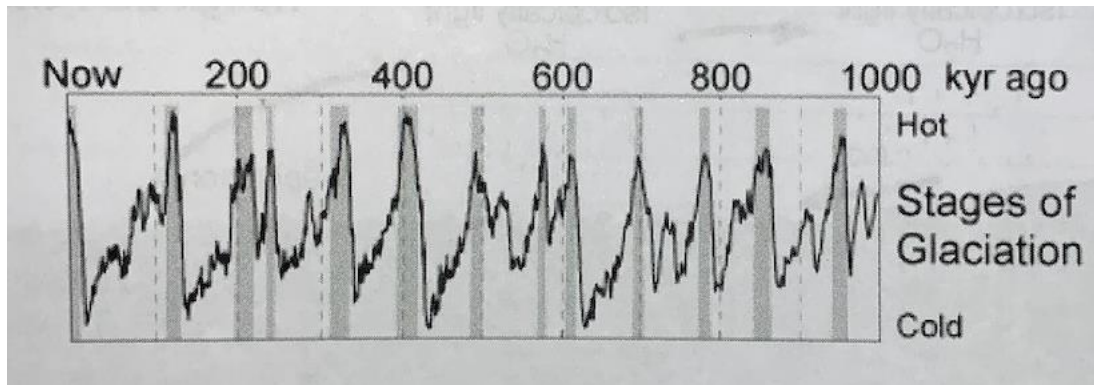
- describe and discuss ancient evidence of variations in global temperature, including but not limited to:
  - pollen grains in sedimentary rocks
  - changes in rock types
  - fossils and microfossils
  - changing isotope ratios in rocks and deep sea sediments
- identify and explain more recent evidence of climate variation, including but not limited to:
  - ice cores containing gas bubbles and oxygen isotopes
  - dendrochronology
  - Aboriginal art sites showing now-extinct species and environments
  - human instrumental records
  - isotope ratios shown in stalagmites, stalactites and corals

#### **3. Inquiry question: Is there scientific evidence that demonstrates how humans could minimise and respond to the effects of increased global temperatures?**

- investigate scientific evidence suggesting ways in which humans may assist to minimise any human contribution to the greenhouse effect in their daily lives
- evaluate scientific evidence for the usefulness of a range of mitigation and adaptation strategies, including but not limited to:
  - urban design
  - geo-engineering strategies
  - alternative energy sources
  - using or changing agricultural practices of a range of cultural groups, including those of Aboriginal and Torres Strait Islander peoples

You are to compose answers to the following questions:

1. Assess the use of ONE geo-engineering and ONE urban design strategy in mitigating global temperature increases (8 marks)
2. A Milankovitch cycle is a cyclical movement related to the Earth's orbit around the Sun. There are three of them: eccentricity, axial tilt and precession. According to the Milankovitch Theory, these three cycles combine to affect the amount of solar heat that's incident on the Earth's surface and subsequently influence climatic patterns.



Outline the THREE Milankovitch cycles and describe their impact on Earth's climate using the above graph. (9 marks)

## Task 1 HSC Earth and Environmental Science – Marking guidelines

Grade	Performance Descriptions
<b>A</b> <b>(Extensive)</b>	<ul style="list-style-type: none"> <li>▪ demonstrates an extensive knowledge and understanding of scientific concepts, including complex and abstract ideas</li> <li>▪ communicates scientific understanding succinctly, logically, and consistently using correct and precise scientific terms and application of nomenclature in a variety of formats and wide range of contexts</li> <li>▪ designs and plans investigations to obtain accurate, reliable, valid and relevant primary and secondary data, evaluating risks, mitigating where applicable, and making modifications in response to new evidence</li> <li>▪ selects, processes, and interprets accurate, reliable, valid, and relevant qualitative and quantitative, primary or secondary data, and represents it using a range of scientific formats to derive trends, show patterns and relationships, explain phenomena, and make predictions</li> <li>▪ designs solutions to scientific problems, questions, or hypotheses using selected accurate, reliable, valid, and relevant primary and secondary data, and scientific evidence, by applying processes, modelling and formats</li> <li>▪ applies knowledge and information to unfamiliar situations to propose comprehensive solutions or explanations for scientific issues or scenarios</li> </ul>
<b>B</b> <b>(Thorough)</b>	<ul style="list-style-type: none"> <li>▪ demonstrates thorough knowledge and understanding of scientific concepts, including complex and abstract ideas</li> <li>▪ communicates scientific understanding, logically, and effectively using correct scientific terms and application of nomenclature in a variety of formats and wide range of contexts</li> <li>▪ designs and plans investigations to obtain accurate, reliable, valid and relevant primary and secondary data, evaluating risks, mitigating where applicable, and making some modifications in response to new evidence</li> <li>▪ selects, processes, and interprets accurate, reliable, valid, and relevant qualitative and quantitative, primary or secondary data, and represents it using a range of scientific formats to derive trends, show patterns and relationships</li> <li>▪ designs solutions to scientific problems, questions, or hypotheses using selected accurate, reliable, and valid primary and secondary data, and scientific evidence, by applying processes, and formats</li> <li>▪ applies knowledge and information to unfamiliar situations to propose explanations for scientific issues or scenarios</li> </ul>
<b>C</b> <b>(Sound)</b>	<ul style="list-style-type: none"> <li>▪ demonstrates sound knowledge and understanding of scientific concepts</li> <li>▪ communicates scientific understanding effectively using scientific terms and application of nomenclature</li> <li>▪ designs and plans investigations to obtain primary and secondary data and evaluates risks</li> <li>▪ processes and interprets primary and secondary data, and represents it using a range of scientific formats</li> <li>▪ identifies scientific problems, questions, or hypotheses and applies processes, and formats to primary or secondary data</li> <li>▪ applies knowledge and information relevant to scientific issues or scenarios</li> </ul>
<b>D</b> <b>(Basic)</b>	<ul style="list-style-type: none"> <li>▪ demonstrates basic knowledge and understanding of scientific concepts</li> <li>▪ communicates scientific understanding using basic scientific terms and application of nomenclature</li> <li>▪ implements scientific processes to obtain primary and secondary data and identifies risks</li> <li>▪ processes primary or secondary data, and represents it using scientific formats</li> <li>▪ responds to scientific problems, questions, or hypotheses</li> <li>▪ recalls scientific knowledge and information</li> </ul>
<b>E</b> <b>(Limited)</b>	<ul style="list-style-type: none"> <li>▪ demonstrates limited knowledge and understanding of scientific concepts</li> <li>▪ communicates scientific understanding using limited scientific terms</li> <li>▪ partially outlines investigations to obtain data and information</li> <li>▪ provides simple descriptions of scientific phenomena</li> <li>▪ recalls basic scientific knowledge and information</li> </ul>