# Sample Assessment Task Year 12

# Earth and Environmental Science

## Sample for implementation for Year 12 from Term 4, 2018

### Context:

Students examine the mechanisms and scientific evidence for climate variation. They distinguish between evidence of natural processes and scientific evidence of anthropogenic influences, which both cause the Earth’s climate to change. Students are provided with opportunities to form evidence-based opinions on, and develop strategies to manage, the effects of climate variation in the future.

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| Task number: 3 | WEIGHTING: 25% | Timing: Term 2, Week 10 |
| Outcomes assessedA student:* develops and evaluates questions and hypotheses for scientific investigation EES11/12-1
* solves scientific problems using primary and secondary data, critical thinking skills and scientific processes EES11/12-6
* communicates scientific understanding using suitable language and terminology for a specific audience or purpose EES11/12-7
* analyses the natural processes and human influences on the Earth, including the scientific evidence for changes in climate EES12-14
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| Nature of the taskResearch and Oral Presentation task on Australia’s response to managing climate variation.Students produce summary fact sheet(s) of their findings and deliver a speech accompanied by a digital presentation from the point of view of a climate action group or government minister explaining the options Australians have to:* minimise any human contribution to the greenhouse effect in their daily lives (Fact Sheet 1)
* evaluate scientific evidence for the usefulness of a range of mitigation and adaptation strategies (Fact Sheet 2)
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##### Marking Criteria

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| Knowledge and understanding – 10 marks**EES12-14 analyses the natural processes and human influences on the Earth, including the scientific evidence for changes in climate**Students:* describe scientific evidence indicating that changes in climate have occurred
* explain natural processes that may affect climate
* explain human influences that may affect climate

Questioning – 5 marks**EES11/12-1 develops and evaluates questions and hypotheses for scientific investigation**Students:* develop and evaluate inquiry questions and hypotheses to identify a concept that can be investigated scientifically, involving primary and secondary data
* modify questions and hypotheses to reflect new evidence

Problem Solving – 5 marks**EES11/12-6 solves scientific problems using primary and secondary data, critical thinking skills and scientific processes**Students:* use modelling (including mathematical examples) to explain phenomena, make predictions and solve problems using evidence from primary and secondary sources
* use scientific evidence and critical thinking skills to solve problems

**Communicating – 10 marks****EES11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose**Students:* select and use suitable forms of digital, visual, written and/or oral forms of communication
* select and apply appropriate scientific notations, nomenclature and scientific language to communicate in a variety of contexts
* construct evidence-based arguments and engage in peer feedback to evaluate an argument or conclusion
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### Marking Guidelines

##### A student:

| Outcome | Developing | Elementary | Substantial | High |
| --- | --- | --- | --- | --- |
| **EES12-14 analyses the natural processes and human influences on the Earth, including the scientific evidence for changes in climate****Maximum marks 10** | * describes at least one piece of evidence that climate has changed
* identifies a natural process and/or a human influence on climate

**Marks 1–3** | * describes some scientific evidence that climate has changed
* describes how natural processes affect climate
* describes how human influences affect climate

**Marks 4–5** | * explains how some types of scientific evidence indicate how climate has changed
* explains how natural processes affect climate
* explains how human influences affect climate

**Marks 6–8** | * explains how several types of scientific evidence indicate how climate has changed
* explains the importance of having different types of evidence suggesting the same occurrences
* explains how a number of natural processes affect climate
* explains how a number of human influences affect climate

**Marks 9–10** |
| **EES11/12-1 develops and evaluates questions and hypotheses for scientific investigation****Maximum marks 5** | * poses questions that may or may not relate to concept

**Marks 1** | * poses questions that are relevant to the concept but cannot be tested by an investigation

OR* identifies a relationship between climate variation and some of its causes

**Marks 2** | * formulates a hypothesis based on a relevant question taken from observations, experiments and/or research
* identifies integral relationships between climate variation and its causes

**Marks 3** | * develops a hypothesis from a relevant question suggesting valid predictions
* provides a point of view on the relevant issue or problem in context
* evaluates the evidence for testability, validity and relevance

**Marks 4–5** |
| **EES11/12-6 solves scientific problems using primary and secondary data, critical thinking skills and scientific processes****Maximum marks 5** | * does not address the question/problem to be solved and the conclusion is incomplete

**Marks 1** | * demonstrates a weak understanding of the science concept as evidenced by:
* inappropriate use of scientific vocabulary
* not supporting connections between data, observations and new concepts using evidence

**Marks 2** | * demonstrates a sound understanding of the science concept being investigated as evidenced by:
* appropriate use of new scientific vocabulary
* connections between data, observations and concepts supported by specific evidence

**Marks 3** | * demonstrates comprehensive understanding of the science concept being investigated as evidenced by:
* extensive use scientific vocabulary
* clear connections between data, observations and concepts consistently supported by specific evidence

**Marks 4–5** |
| **BIO11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose****Maximum marks 10** | * does not clearly define subject and purpose
* provides little evidence to support ideas or conclusions
* demonstrates limited understanding of information

**Marks 1–2** | * attempts to define purpose and subject
* provides generalisations to support ides or conclusions
* uses limited scientific information

**Marks 3–5** | * provides clear purpose and subject
* uses evidence to support ideas or conclusions
* demonstrates sound knowledge by explaining scientific concepts

**Marks 6–8** | * explains purpose and subject
* supports conclusions/ideas with relevant scientific evidence
* demonstrates thorough knowledge by explaining scientific concepts in a logical way and comprehensive way

**Marks 9–10** |