VCE Units 3 and 4 Environmental Science: Performance descriptors

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| **VCE ENVIRONMENTAL SCIENCE****SCHOOL-ASSESSED COURSEWORK** |
| **Assessment task: ‘Application of Earth systems thinking in the evaluation of a response to an environmental scenario, case study, issue or challenge’** |
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| ***Unit: <insert>******Outcome: <insert no.>******<insert outcome statement>*** |  | **DESCRIPTOR: typical performance in each range** |
| **Key Science Skills** |  **Increasing levels of performance**  |
| ***Develop aims and questions, formulate hypotheses and make predictions*** | * States the aim, question, problem or issue that will be explored through Earth systems thinking.
 | * Identifies the scientific concepts (biodiversity, environmental management, climate change or energy) involved in the environmental scenario, case study, issue or challenge.
 | * Describes how Earth systems thinking relates to the environmental scenario, case study, issue or challenge.
 | * Explains how Earth systems thinking will be applied to evaluate a response to the environmental scenario, case study, issue or challenge.
 | * Discusses further information that could be collated to evaluate a response to the environmental scenario, case study, issue or challenge.
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| ***Generate, collate and record data*** | * Selects relevant data
* Uses a labelled arrow to represent a link within one of Earth’s systems.
 | * Represents data in a useful format
* Uses a flow chart to show a process within one of Earth’s systems.
 | * Shows trends in data
* Uses a graphic organiser to compare processes within Earth’s four systems.
 | * Explains trends in data
* Uses a graphic organiser to represent relationships across Earth’s four systems.
 | * Discusses how data relates to Earth systems thinking
* Uses a graphic organiser to show the cause-and-effect of action on Earth’s four systems.
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| ***Analyse, evaluate and communicate scientific ideas*** | * Defines a scientific model
* Constructs representations of Earth’s four systems: atmosphere, biosphere, hydrosphere and lithosphere
* Identifies a limitation in modelling a link within an Earth system.
 | * Outlines how a model is useful in simplifying complex ideas
* Constructs a simple model to show the connections between Earth’s four systems
* Identifies a limitation in modelling links between Earth’s systems.
 | * Explains why models are used to represent Earth’s systems
* Discusses Earth’s four systems functioning as an integrated whole rather than as a sum of its parts
* Describes the difference between a model of Earth’s systems and Earth systems thinking.
 | * Explain the relationship between Earth’s systems and the scenario, case study, issue or challenge
* Constructs a model of Earth’s systems that includes information relevant to the scenario, case study, issue or challenge
* Explains how the modelling of Earth’s systems facilitates Earth systems thinking.
 | * Explains the connections between Earth’s systems with reference to their evaluation of a response to a scenario, case study, issue or challenge
* Constructs a model of Earth’s systems that includes information relevant to their evaluation
* Discusses limitations of Earth systems thinking.
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| * Responds to a proposed environmental activity that will affect Earth systems
* Provides an evaluation of a response to the environmental scenario, case study, issue or challenge about an Earth system
 | * Identifies how Earth systems will be affected by a proposed environmental activity
* Describes how Earth systems are involved in their evaluation of a response to the environmental scenario, case study, issue or challenge.
 | * Compares strengths and weaknesses of a proposed environmental activity on Earth systems
* Explains why Earth systems should be considered in evaluating a response to the scenario, case study, issue or challenge.
 | * Analyses the short-term effects of a proposed environmental activity on Earth systems
* Supports an evaluation of a response to the environmental scenario, case study, issue or challenge using Earth systems thinking.
 | * Evaluates the long-term effects of a proposed environmental activity on Earth systems
* Reflects on how their own value system impacted on their evaluation of a response to an environmental scenario, case study, issue or challenge.
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| * States how sustainability principles relate to the scenario, case study, issue or challenge
* Defines ecological integrity.
 | * Explains why sustainability principles are important in analysing the scenario, case study, issue or challenge
* Outlines how ecological integrity is supported by the response to the scenario, case study, issue or challenge.
 | * Analyses the scenario, case study, issue or challenge in terms of sustainability principles
* Explains how ecological integrity is sustained by the response to the scenario, case study, issue or challenge.
 | * Evaluates the scenario, case study, issue or challenge in terms sustainability principles
* Suggests a short-term challenge to sustaining ecological integrity.
 | * Discusses how sustainability principles may apply to the scenario, case study, issue or challenge in future years
* Predicts long-term challenges to sustaining ecological integrity.
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| * Defines scientific evidence
* Identifies sociocultural, economic, political, legal and/or ethical factors relevant to the scenario, case study, issue or challenge
* Lists relevant points in evaluating a response to an environmental scenario, case study, issue or challenge.
 | * Defines non-scientific evidence
* Describes how sociocultural, economic, political, legal and/or ethical factors relate to the scenario, case study, issue or challenge
* Identifies key knowledge, evidence and aspects of Earth systems thinking in evaluating a response to an environmental scenario, case study, issue or challenge.
 | * Distinguishes between scientific and non-scientific evidence
* Explains why sociocultural, economic, political, legal and/or ethical factors are important in analysing the scenario, case study, issue or challenge
* Uses relevant knowledge, evidence and application of Earth systems thinking in evaluating a response to an environmental scenario, case study, issue or challenge.
 | * Explains why judgements or decisions may not always be based on scientific evidence
* Explains how sociocultural, economic, political, legal and/or ethical factors relate to Earth systems thinking
* Explains the relationship between knowledge, evidence and Earth systems thinking in evaluating a response to an environmental scenario, case study, issue or challenge.
 | * Explains why non-scientific evidence may be important in making a judgement or decision
* Discusses why sociocultural, economic, political, legal and/or ethical factors are important in Earth systems thinking
* Synthesises knowledge, evidence and Earth systems thinking in evaluating a response to an environmental scenario, case study, issue or challenge.
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