VCE Units 3 and 4 Environmental Science: Performance descriptors

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| **VCE ENVIRONMENTAL SCIENCE****SCHOOL-ASSESSED COURSEWORK** |
| **Assessment task: ‘Designed or practical response to a real or theoretical environmental 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 environmental issue or challenge which requires a designed or practical response
* Identifies a possible outcome of the investigation.
 | * Describes the scientific concepts (biodiversity, environmental management, climate change or energy) relevant to the issue or challenge.
* Lists possible alternative outcomes of the investigation.
 | * Summarises the key aspects of the issue or challenge that will be addressed by the designed or practical response.
* Describes factors that may affect the outcomes of the investigation.
 | * Explains the approach taken to develop a designed or practical response to the issue or challenge.
* Discusses how different factors may affect the outcome of the investigation.
 | * Supports a designed or practical approach by referring to relevant background research
* Predicts the most likely outcome of the investigation based on prior knowledge.
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| ***Plan and conduct investigations*** | * Describes the development of a product, process or system relevant to a practical response to an environmental issue or challenge
* Develops a design brief relevant to the issue or challenge.
 | * Supports the development of a product, process or system methodology with relevant background information
* Breaks up the design brief into smaller tasks.
 | * Explains how the product, process or system will provide a response to an environmental issue or challenge
* Documents preliminary testing data.
 | * Discusses the use of criteria in determining the effectiveness of the product, process or system needs in responding to the environmental issue or challenge
* Modifies design based on preliminary data.
 | * Develops relevant criteria to evaluate the product, process or system
* Presents a final product, process or system based on feedback.
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| ***Generate, collate and record data*** | * Classifies data as primary or secondary.
 | * Distinguishes between qualitative and quantitative data.
 | * Discusses the data relevant to their investigation.
 | * Explains how data will be analysed to address the investigation question.
 | * Defends the type and amount of data required to be generated to address the investigation question.
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| ***Analyse and evaluate data and investigation methods*** | * Summarises data
* Distinguishes between the investigation methodology and method used in the selected investigation.
 | * Selects relevant data for analysis
* States whether the investigation methodology and method led to valid data being generated.
 | * Identifies trends or patterns in data
* Discusses how effectively the investigation methodology and method enabled valid data to be generated.
 | * Makes a claim based on data
* Discusses how effectively the investigation methodology and method enabled a valid conclusion to be drawn.
 | * Evaluates the quality of data
* Compares the strengths and weaknesses of the selected methodology and method used to draw a conclusion.
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| ***Construct evidence-based arguments and draw conclusions*** | * Describes the current situation in relation to the environmental issue or challenge
* Lists advantages and disadvantages of different options as a response to an environmental issue or challenge
* States a conclusion
* States a limitation of conclusions.
 | * Outlines possible consequences if no action is taken in relation to the environmental issue or challenge
* Compares advantages and disadvantages of different options as a response to an environmental issue or challenge
* Uses data to support a conclusion
* Describes limitations of conclusions.
 | * Explains the importance of their response to the environmental issue or challenge
* Ranks different decision options, explaining the criteria used to make decisions to identify viable options
* Connects aims, data, and conclusions
* Explains limitations of conclusions.
 | * Discusses the possible consequences of their response to the environmental issue or challenge over time
* Compares possible ‘worst case’ and ‘best case’ scenarios in adopting different options
* Explains assumptions made in data interpretation
* Discusses experimental validity.
 | * Suggests further research to refine the designed or practical response to an environmental issue or challenge
* Justifies a preferred option in responding to an issue or challenge
* Discusses assumptions made in drawing conclusions
* Identifies further evidence required to draw a valid conclusion.
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| ***Analyse, evaluate and communicate scientific ideas*** | * Identifies the science concepts (biodiversity, environmental management, climate change or energy) involved in a designed or practical response to an environmental issue or challenge
* Identifies the sustainability principles relevant to the environmental issue or challenge
* Uses data to support a response to the environmental issue or challenge.
 | * Describes the science concepts (biodiversity, environmental management, climate change or energy) involved in a designed or practical response to an environmental issue or challenge
* Describes how sustainability principles are involved in the environmental issue or challenge
* Translates analysed data into a summary statement relevant to a response to the environmental issue or challenge.
 | * Makes links between science concepts (biodiversity, environmental management, climate change or energy) central to the designed or practical response to an environmental issue or challenge
* Explains how sustainability principles have been taken into account in developing a response to the environmental issue or challenge
* Explains the use of data in developing a response to the issue or challenge.
 | * Explains the relationships between different concepts (biodiversity, environmental management, climate change or energy) involved in developing a designed or practical response to an environmental issue or challenge
* Proposes short-term solutions in responding to an environmental issue or challenge in terms of sustainability principles
* Explains how their designed or practical response addresses the issue or challenge.
 | * Discusses the importance of the relationships between different concepts (biodiversity, environmental management, climate change or energy) involved in developing a designed or practical response to an environmental issue or challenge
* Proposes long-term solutions in responding to an environmental issue or challenge in terms of sustainability principles
* Discusses how further data may be generated to evaluate the response to the issue or challenge.
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| * Uses a provided scientific report template
* Sketches a response to the issue or challenge.
 | * Adheres to conventions of scientific report writing
* Labels a sketch of a designed or practical response.
 | * Communicates relevant information in a scientific report.
* Highlights distinctive features of the designed or practical response.
 | * Modifies scientific report template to improve cohesion of communication
* Discusses alternative designs that were considered.
 | * Modifies scientific report template to include critical investigation information.
* Defends choices made in determining a final design.
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