Earth and Environmental Science depth study assessment task

Written and Oral presentation

**Syllabus outcomes**

* develops and evaluates questions and hypotheses for scientific investigation EES11/12-1
* designs and evaluates investigations in order to obtain primary and secondary data and information EES11/12-2
* conducts investigations to collect valid and reliable primary and secondary data and information EES11/12-3
* describes human impact on the Earth in relation to hydrological processes, geological processes and biological changes EES11-11

**Assessment task – Earth and Environmental Science Module 4 – Human impacts - Depth Study**

**Depth Study inquiry questions:** (Please answer both of the following enquiry questions in your report.)

1. *Looking back:* How has the lower Strangers creek valley changed as a result of human actions in the last:
	1. Century?
	2. Decade?

(eg: changes in species, biodiversity, erosion, sediment deposition, nutrients)

1. *Looking forward:* How should the Strangers creek area be managed for maximum biodiversity in the future?

(eg: practical management strategies for current and future challenges)

(*Teacher: These inquiry questions are flexible and can be edited, please check with Field of Mars EEC*)

**Context**

In 2010 Ryde Council made a focused effort to rehabilitate Strangers creek. The 3 main goals were:

* to improve the quality of water in the creek,
* control introduced species, and
* protect endangered ecological communities.

As a year group we will conducting field work around Strangers creek with the assistance of Field of Mars Environmental Education Centre.

We will be collecting data and information so that we can assess whether the council management strategies have been successful over time at achieving these 3 main goals outlined above.

After the excursion we will be collating our data and information and working together in pairs to answer the inquiry questions given on page 1.

A final report is to be completed in pairs and/or an oral presentation made individually (*Teacher please edit*)

Communication: You are to present your findings not at the level of your fellow EES students, but targeted at an audience of interested local citizens at a simulated local council presentation.
(Hint: avoid excessive use of “top level scientific language”, and remember these citizens are interested in the practical details of how their local area should be managed and why).

**There are ……. assessable components of this task:** (*Teacher please edit*)
A) You will be required to submit a printed report in pairs

B) You will be required to make an individual oral presentation.

**Tips to help you in the assessment task:**

* Use the Field of Mars EEC resources distributed by your teacher (Fieldwork videos, climate data links, Google map, plans of management etc). These will help you complete the report and oral presentation.
* Maximum 5 printed pages for the report. (word count?? – teacher please edit)
* Oral presentation is to be 2-4 minutes long.
* Include many photos and select data collected on the day of the excursion.
* Your teacher may ask you many questions during your oral presentation. How well you answer these questions will make up part of the marks awarded for your presentation.
* You should develop further questions and areas of inquiry and outline these after you present your main findings. (e.g. questions and hypothesis for future studies, issues with data, comments on the reliability of field methodologies used, etc).
* It is suggested you set up a *google drive* to share resources and data with your partner.
* Presentation should utilize a *PowerPoint, keynote, Prezi*, video blog, engaging pdf, OR any other creative way of presenting (by negotiation with teacher).
* Please see the marking rubric provided in the next few pages – this will be used by to assess your presentation.
* What to include in presentation: anything from the report that you submit, so long as it answers the inquiry questions and outlines new questions/directions for future inquiry related to your findings.

**Include the following in the report:**

* **Introduction.**
	+ - Spatial and geomorphological information: location, position of study sites, general geology (parent rock material).
		- Soil types of the area.
		- Natural processes in the catchment, (eg: erosion and deposition of sediments).
		- Flora and fauna types present in the Strangers creek catchment.
		- Climatic data relevant to the Ryde area.
* **Summarise the historical (last 100 years) and current (last 10 years) human actions and impacts.**
* **Field work methods, data and findings.**
	+ - Graphs, tables, photographs, annotated map.
* **Case study on 1 or 2** (teacher please edit) **introduced species in the Strangers creek area.** Including:
	+ - The biotic and abiotic effects of the introduced species
		- reasons for introducing the species
		- area affected by the species
		- human impacts that favour the introduced species
		- control or mitigation methods
		- economic impact of the species
		- different views about the value of and/or harm caused by the introduced species
		- analysis of the ways in which human activity has upset the balance of ecosystems and favoured the introduced species
		- description of the ways in which the introduced species have contributed to the decline or extinction of native Australian species
* **Discussion of *some* of the abiotic and biotic measurement data and/or methods used in the field study.**
	+ - Validity
		- Reliability
		- Accuracy
		- Possible sources of error

# Stage 6 Depth Study EES Oral presentation rubric (total 30 marks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Grade A / Band 6** | **Grade B / Band 5** | **Grade C / Band 4** | **Grade D / Band 3** | **Grade E / Band 2** |
| **Knowing and understanding** | applies extensive knowledge and understanding of scientific models, theories and laws, and about the nature, use and influence of science | applies thorough knowledge and understanding of scientific models, theories and laws, and about the nature, use and influence of science | demonstrates sound knowledge and understanding of scientific models, theories and laws, and about the nature, use and influence of science | demonstrates basic knowledge and understanding of scientific models, theories and laws, and about the use and influence of science | demonstrates elementary knowledge and understanding of some scientific principles, and about some uses of science |
| **Field****(40%)****MARK** | * Clear definition of issue
* Clear understanding of impacts and management of introduced species
* Extensive, detailed and insightful evaluation of the environmental issue
* Clear personal point of view (POV)
* Evaluation of how effective the control or mitigation methods are

10 9 | * Clear definition of issue
* Detailed understanding of impacts and management of introduced species
* Detailed and insightful evaluation of the environmental issue
* personal POV
* Justification of how effective the control or mitigation methods are

8 7 | * Clear definition of issue
* Sound understanding of impacts and management of introduced species
* Sound evaluation of issue
* Clear personal POV

Explanation of how effective the control or mitigation methods are  6 5 | * Basic description of issue
* understanding of impacts and management of introduced species
* Superficial evaluation of issue
* elementary personal POV
* Description of how effective the control or mitigation methods are

4 3 | * Limited knowledge of issue or understanding of the impacts and management of introduced species
* Opinion offered without elaboration
* Identify how effective the control or mitigation methods are

 2 1 |
| **Questioning and predicting****10%** | identifies and proposes valid questions or hypotheses, asks questions and makes evidence based predictions | identifies and proposes coherent questions or hypotheses, asks questions and makes logical predictions | identifies and proposes related questions or hypotheses, asks questions and make predictions | asks questions and makes some predictions | asks questions and attempts prediction |
| **MARK** | * Questions developed from initial study drives investigation.
* Questions clearly identify variables to be examined
* future questions and areas of inquiry detailed

5 | * Questions developed from initial study drives investigation.
* Questions identify variables to be examined
* future questions and areas of inquiry outlined

4 | * Questions developed from initial study drives investigation.
* Variables to be examined identified but not fully addressed
* future questions and areas of inquiry mentioned

3 | * Question leads investigation
* Variables and future directions not adequately defined or described

2 | Question, investigation and future directions have limited cohesion1 |
| **Processing and analysing data and information****10%** | uses critical thinking skills to evaluate trends, patterns and relationships to draw evidence-based scientific conclusions | uses critical thinking skills to explain trends, patterns and relationships to draw scientific conclusions | explains trends, patterns and relationships to draw scientific conclusions | describes trends, patterns and draws some conclusions | recounts conclusions |
| **MARK** | Uses critical thinking skills to evaluate trends, patterns and relationships in data to draw insightful evidence-based scientific conclusions 5 | uses critical thinking skills to explain trends, patterns and relationships in data to draw scientific conclusions4 | Sound explanation trends, patterns and relationships to draw scientific conclusions3 | Describes trends, patterns and draws some conclusions2 | Limited description of dataProvides assertions about trends in the data1 |
| **Problem solving****10%** | effectively gathers, selects, organises and processes first-hand and secondary sourced data and information to evaluate issues and inform creative solutions using appropriate digital technologies | systematically gathers, selects, organises and processes first-hand and secondary sourced data and information to explain issues and inform problem-solving using appropriate digital technologies | gathers and selects first-hand and secondary sourced data and information to identify issues and participate in problem-solving using appropriate digital technologies | uses first-hand and secondary sourced data and information, and appropriate digital technologies, to assist in the problem-solving process | uses information provided and, with assistance, participates in problem-solving activities |
| **MARK** | 5 | 4 | 3 | 2 | 1 |
| **Communicating****30%** | communicates comprehensive understanding of scientific ideas, and related evidence for a particular **purpose** and **audience** using scientific units, language conventions and text types. | communicates well-developed understanding of scientific ideas to an audience using scientific units and language conventions. | communicates sound understanding of scientific ideas to an audience. | communicates basic scientific understanding to an audience. | with guidance, communicates elementary scientific information to an audience. |
| **Mode – Structure of presentation** **MARK** | Presentation is well presented in a comprehensive and logical way:·       Introduction·       process,·       context and significance,·       benefits and detrimentslogically argued (point & elaboration)5 | Presentation is thorough in its presentation of subject matter. Most elements of structure present, Some elements could be more clearly presented.   4 | Most elements present. Limited development of arguments.   3 | Basic presentation. Field is clear but not well elaborated. Arguments not well developed.    2 | Limited structural approach. Elements not clearly delineated. Audience left confused.    1 |

Teacher comments:

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