Yr 12 Earth and Environmental Science
Module 6 Hazards
Assessment Task 2, 2023

TOPIC: Module 6: Hazards ***Interactive Conceptual Model and Evaluation***	**MARKS: 25**
SUBMISSION REQUIREMENTS: **All** components for Part A and Part B; including evidence such as a photos/video of the physical model*, must be submitted online via CANVAS by 11.59pm **Friday** 17th March, Term 1 Week 8. *Physical Models must be submitted in E02 by 3pm Friday 17th March, Term 1 Week 8.	**WEIGHT: 25 %**

OUTCOMES TO BE ASSESSED:

EES12- 2 **Designs** and evaluates investigations to obtain primary and secondary data and information
EES12- 5 **Analyses** and evaluates primary and secondary data and information
EES12- 7 **Communicates** scientific understanding using suitable language and terminology for a specific audience or purpose
EES12- 13 **Describes** and **evaluates** the causes of Earth's hazards and the ways in which they affect, and are affected by, the Earth's systems

DIRECTIONAL VERBS:
Analyse Identify the components and the relationship between them; draw out and relate implications.
Communicate Share or exchange information, news, or ideas.
Designs Do or plan (something) with a specific purpose in mind.
Evaluate Make a judgement based on criteria; determine the value of.
Explain Relate cause and effect; make the relationships between things evident; provide why and/or how.

TASK DESCRIPTION:
This assessment task has **TWO** parts:
Part A (15 marks):
Design and construct a scientific model to obtain primary data related to Earth's Hazards. The model must **describe** the cause of a geological disaster and **analyse** the impacts of the disaster on the Earth's Spheres.

Part B (10 marks):
Evaluation of model **design** and execution.

ASSESSMENT CRITERIA:

Part A Model ***(15 marks)***

Students are to design and construct an interactive model in an appropriate format that will enable them to obtain primary data when demonstrating the process of a natural hazard. The model (if applicable see * below) should be easily transportable by one person, less than 10kg and 1m x 1m in dimension.

A model can be anything that represents the chosen concept. It needs to answer questions, solve problems and make predictions about a concept.

The model chosen for this assessment task could include, but not limited a:

- Physical static or moving model that can be picked up and moved around
- Digital static or moving model on a screen
- Activity, game, act or other demonstration involving people
- Mathematical equation, graph or organised set of data
- Any other representation of the chosen concept that fulfils the criterium of "model".

To meet the assessment criteria the following should be addressed:

A written or oral (recorded) summary of the construction of the model and instructions for use the model must be included. This could be written in the form of a method for a practical investigation. With numbered steps, in third person instructive language and labelled diagrams.

There is no word or page limit for this section, as models require different length steps for instructions; however, it is recommended that students are concise with their language.

The model should be appropriately annotated (either in written or verbal format) in order to address the marking criteria.

Students need to demonstrate safe and quality construction and design skills to produce a neat and reliable model that is easy to use and works as intended.

The gathering and processing of first- and second-hand data and information must be evident in the forms of appropriate bibliography and in text referencing.

* In the event that Video or Photo's of the model in operation cannot be uploaded to CANVAS then the Physical Model must be submitted to the teacher by 3pm on Friday the 17th of March.

Part B Evaluation ***(10 marks)***

No model is a perfect representation of the concept it represents. All models have strengths that help explain a concept, deepen an understanding and make predictions for their intended audience. However, all models also have limitations; areas in which they are lacking accurate representation of the concept.
Students are required to use critical thinking in the **evaluation** and testing of the model, discussing alternatives and modifications, and suggest worthwhile directions for future development.

This section should be between 2-3 pages (1000 words) typed plus images/diagrams.

ASSESSMENT MARKING CRITERIA

Part A: Design of Interactive conceptual model Outcomes: EES12-2, EES12-7, EES12-13	**Mark**	**Grade**
A **comprehensive** model will demonstrate: ○ The correct use of scientific language that conveys a deep understanding of the causes of geological hazard and ○ A deep understanding of the associated impacts on the Earth's spheres. ○ Clear **analysis** of the interconnectedness between Earths processes and geological disasters ○ Model **design** works as intended supported by detailed operational details ○ Extensive use of first hand and/or secondary source is evident ○ Appropriate referencing and bibliography is included.	13-15	A
A **thorough** model will demonstrate: ○ The general use of scientific language that conveys a thorough understanding of the causes of geological hazard and ○ A thorough understanding of the associated impacts on the Earth's spheres. ○ Clear explanation of the link between Earths processes and geological disasters ○ Model **design** works as intended with clear operational details ○ Thorough use of first hand and/or secondary source is evident ○ Appropriate referencing and bibliography is included.	10-12	B
A **sound** model will demonstrate: ○ The use of some scientific language that conveys a sound understanding of the causes of geological hazard and ○ A sound understanding of the associated impacts on the Earth's spheres. ○ An outline of the link between the Earths processes and geological disasters ○ Model **design** works as mostly as intended following operational details ○ Satisfactory use of first hand and/or secondary source is evident ○ Appropriate referencing and bibliography is included.	7-9	C
A **basic** model will demonstrate: ○ The attempted use of scientific language that conveys an understanding of the cause(s) of geological hazard and ○ An understanding of the associated impacts on the Earth's spheres. ○ Identification of the link between the Earths process and the geological disaster ○ Model **design** works as somewhat as intended, operational details are incomplete ○ Limited use of first hand and/or secondary source is evident ○ Referencing and bibliography is included.	4-6	D
A **limited** model will demonstrate: ○ Identification of the cause of geological hazard OR ○ Identification of the associated impact(s) on Earth's sphere(s) with ○ Limited and/or Inaccurate use of scientific language. ○ Identification of the link between the Earths Process and the Geological Disaster ○ Modelling design is limited with incomplete or missing concept or provision of operational details ○ Limited bibliography OR limited referencing	1-3	E

Part B: Design and Evaluation **Outcome EES12-5 EES 12-7**		
	Marks	**Grades**
A **comprehensive** evaluation will provide extensive judgement of overall effectiveness of model supported by: ○ An in-depth, critical evaluation citing multiple positive **AND** negative aspects of the student's interactive model. ○ An extensive analysis that explains **AND** justifies each positive **AND** negative aspect. ○ An explanation of the purpose of using models in Science and provide evidence-based suggestions for worthwhile directions in future development of scientific modelling.	9-10	A
A **thorough** evaluation will provide a judgement based on overall effectiveness of model supported by: ○ An in-depth, critical evaluation citing multiple positive **AND** negative aspects of the student's interactive model. ○ A Justification of each positive **AND** negative aspect of the model. ○ An explanation of the purpose of using models in Science and identifies a direction of future development of scientific modelling. A current example of modelling is outlined.	7-8	B
A **sound** evaluation will provide some judgement on the overall effectiveness of model supported by: ○ An evaluation which identifies both a positive **AND** negative aspect of the student's interactive model. ○ Justifications provided for 1 positive **AND** 1 negative aspect ○ Outline the purpose of using models in Science and identifies a need future development of scientific modelling	5-6	C
A **basic** evaluation could provide a judgement on the effectiveness of a model supported by: ○ A description of some aspects (positive and/or negative) of the student's interactive model. ○ An attempt of a justification for a positive or negative judgement ○ Identification of the need for using scientific models or gives an example of current models being used in relation to Earth's processes	3-4	D
A **limited** evaluation may attempt to evaluate the model supported by: ○ An identification of the models' processes, either positive and/or negative, with inaccuracies or unsupported justification ○ An Identification of a currently used scientific model relevant to Earth's processes	1-2	E