



# ORANGE HIGH SCHOOL

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## ASSESSMENT TASK NOTIFICATION

<b>Subject</b>	Investigating Science 'Task 2: Depth study of scientific models'
<b>Year</b>	11 (Preliminary HSC)
<b>Weighting</b>	30%
<b>Teacher</b>	Mrs Boardman, Ms Percival and Mr Routh
<b>Head Teacher</b>	<u>Ms Huggett</u>
<b>Week handed out</b>	Week 3, Term 3, 2023
<b>Date and school week</b>	Wednesday 30 <sup>th</sup> August 2023 - Week 7A Term 3 (by 9am on Google Classroom)

### Assessment Outline

#### **Outline of Task:**

This task will consist of 4 parts:

- A worksheet that will need to be completed during the Questacon excursion (Wk3, T3)
- A research component on a scientific concept
- An analysis of a scientific model
- Creating a response to a variety of HSC-style questions

If absent for Questacon: Your alternative way to complete Part 1, is to use the following websites to gather supporting information:

- Questacon Canberra | National Science and Technology Centre Tour [https://youtu.be/\\_O5d0RB7yuw](https://youtu.be/_O5d0RB7yuw)
- Questacon Science Museum, Canberra ACT Australia <https://youtu.be/Wqq5aIVOlme>
- Questacon - Canberra <https://youtu.be/18DtNbtO7nc>
- Free Fall at Questacon [https://youtu.be/O2BJ5Z\\_78hY](https://youtu.be/O2BJ5Z_78hY)
- Earthquake simulation, Questacon Canberra <https://youtu.be/yuSTBsPmIF4>

#### **Non-completion of Task:**

If you know you are going to be away on the day that the task is due, you must make alternative arrangements with your classroom teacher. If you are away on the day of the examination, you must catch up with your classroom teacher on the first day you return to make alternate arrangements to catch up on this task.

**Failure to follow the above procedures may result in a zero award.**

### Outcomes Assessed

**INS11 – 1** Develops and evaluates questions and hypotheses for scientific investigation

**INS11 – 4** Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media

**INS11 – 6** Solves scientific understanding using primary and secondary data, critical thinking skills and scientific processes

**INS11 – 7** Communicates Scientific understanding using suitable language and terminology for a specific audience or purpose

**INS11 – 10** Develops, and engages with, modelling as an aid in predicting and simplifying scientific object and process

**Please note:** Outcomes 11.8 & 11.9 have been removed as this task is only based on Module 3: Models (11.10)

**Part 1**

**(a) Complete the following table during the Questacon (Wk3, T3) excursion. You will need to look at a minimum of SEVEN models. (10 marks)**

Name of model	Image of model	Description of the model and the scientific concept it is explaining	Identify some advantages to the model	Identify some limitations to the model

**(b) Analyse why Questacon is a great source of information that supports the understanding of scientific concepts. Reference the table above and your experience there in your response. (5 marks)**

Positives	Negatives
<b>Judgement statement</b>	

**Part 2**

**With reference to the atomic model, explain why new evidence can challenge the use of existing scientific models and may result in those models being contested and refined or replaced. (5 marks)**

**Part 3**

**Evaluate how scientific models draw on a growing body of data from a wide range of disciplines and technologies to refine predictions and test new hypotheses, referencing the models of the Universe. (5 marks)**

**Part 4**

Create a response to each of following HSC-style questions.

**(a) Identify a mathematical formula or expression used in this course and clarify what made this mathematical model useful. (2 marks)**

**(b) Albert Einstein is credited with the following quote:**

*'Everything should be made as simple as possible, but not simpler.'*

**Interpret this statement in relation to a named scientific model that you constructed. In your answer, explain how you evaluated the effectiveness of your model. (3 marks)**

**(c) Assess the effectiveness of diagrams as a model at facilitating the understanding of scientific processes and structures. (5 marks)**

## Marking Rubric: Task 2: Depth study of scientific models

NAME: \_\_\_\_\_

Outcome and content addressed	Extensive	Thorough	Sound	Basic	Limited
<b>Part 1 (a)</b> INS11 – 10 Develops, and engages with, modelling as an aid in predicting and simplifying scientific object and process	10 – 9 Information supplied on all SEVEN or more models, including name of model, image of model, description of model + scientific concept, advantages and limitations at an extensive level	8 – 7 Information supplied on at least SIX models including name of model, image of model, description of model + scientific concept, advantages and limitations at a thorough level	6 – 5 Information supplied on FIVE or less models including name of model, image of model, description of model + scientific concept, advantages and limitations at a sound level	4 – 3 Information supplied on models including name of model, image of model, description of model + scientific concept, advantages and limitations at a basic level	2 – 0 Information supplied on models including name of model, image of model, description of model + scientific concept, advantages and limitations at a limited level
<b>Part 1 (b)</b> INS11 – 10 Develops, and engages with, modelling as an aid in predicting and simplifying scientific object and process	5 Analysis (components identified and relationship between them defined) of why Questacon is a great source of information that supports the understanding of scientific concepts to an extensive level. Table is referenced clearly in the response.	4 Analysis (components identified and relationship between them defined) at a thorough level. Table is referenced clearly in the response.	3 Analysis (components identified and relationship between them defined) at a sound level. Table is referenced clearly in the response.	2 Analysis (components identified and relationship between them defined) at a sound level.	1 – 0 Analysis at a limited level. OR Table is referenced only
<b>Part 2</b> INS11 – 1 Develops and evaluates questions and hypotheses for scientific investigation	5 Explanation (cause and effect – why/how) of why new evidence can challenge the use of existing scientific models, that may result in those models being contested and refined or replaced at an extensive level. The atomic model must be referenced in detail.	4 Explanation (cause and effect – why/how) at a thorough level. The atomic model must be referenced.	3 Explanation (cause and effect – why/how) at a sound level. The atomic model must be referenced.	2 Explanation (cause and effect – why/how) at a basic level. The atomic model must be referenced.	1 – 0 Explanation at a basic level. OR The atomic model referenced only
<b>Part 3</b> INS11 – 4 Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media	5 Evaluation (description, points for and against, and judgement statement) of how scientific models draw on a growing body of data from a wide range of disciplines and technologies to refine predictions and test new hypotheses, referencing the models of the Universe at an extensive level.	4 Evaluation (description, points for and against, and judgement statement) at a thorough level.	3 Evaluation (description, points for and against, and judgement statement) at a sound level.	2 Evaluation (description, points for and against, and judgement statement) at a basic level.	1 – 0 Evaluation (description, points for and against, and judgement statement) at a limited level.
<b>Part 4 (a and b)</b> INS11 – 6 Solves scientific understanding using primary and secondary data, critical thinking skills and scientific processes	5 Identify (name) a mathematical formula or expression used in this course and clarify (make clear) what made this mathematical model useful at an extensive level. Interpretation (draw meaning from) of the statement in relation to a named scientific model that was constructed. In the response, explain (cause and effect – why/how) how you evaluated the effectiveness of your model at an extensive level.	4 Identified (name) and clarified (make clear) at a thorough level. Interpretation (draw meaning from) and explanation (cause and effect – why/how) at a thorough level.	3 Identified (name) and clarified (make clear) at a sound level. Interpretation (draw meaning from) and explanation (cause and effect – why/how) at a sound level.	2 Identified at a limited level. Interpretation and explanation at a limited level.	1 – 0 Identified at a basic level. Interpretation and explanation at a basic level.
<b>Part 4 (c)</b> INS11 – 7 Communicates Scientific understanding using suitable language and terminology for a specific audience or purpose	5 Assessment of (points for and against, and a judgement statement) the effectiveness of diagrams as a model at facilitating the understanding of scientific processes and structures at an extensive level.	4 Assessment of (points for and against, and a judgement statement) at a thorough level.	3 Assessment of (points for and against, and a judgement statement) at a sound level.	2 Assessment at a limited level.	1 – 0 Assessment at a basic level.

Outcomes - marks	INS11 – 10 /15	INS11 – 1 /5	INS11 – 4 /5	INS11 – 6 /5	INS11 – 7 /5
Total marks	/35				
Grades	A 35 – 33	B 32 – 29	C 28 – 10	D 9 – 5	E 4 – 0

**Teacher Feedback:**

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