ORANGE HIGH SCHOOL

ASSESSMENT TASK NOTIFICATION

Subject	Investigating Science
Year	11 (Preliminary HSC)
Weighting	30%
Teacher	Mrs Boardman
Head Teacher	Mr Shea
Date given	Friday 23td July 2020 – Week 2B Term 3
Date and school week	Wednesday 25th August 2020 - Week 7A Term 3

Assessment Outline

Outline of Task:

This task will consist of 4 parts:

- A literature review, where students assess secondary data that helped them to plan their model
- A scientific model, created by the student to explain a concept and make a prediction
- A verbal presentation to other students to explain their model during Wednesday 25th August lesson
- A log book, where the student regularly records progress towards their depth study

Further detail for each can be found in the Support Document (below)

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 – 8 Identifies that the collection of primary and secondary data initiates scientific investigations
INS11 – 9 Examines the use of inferences and generalisations in scientific investigations
INS11 – 10 Develops, and engages with, modelling as an aid in predicting and simplifying scientific object and process

Year 11 Investigating Science Assessment Task 1

Support Document

All models and practical investigations will be conducted individually.

Steps in conducting Depth Study

1) Research types of models and evaluate existing models
2) Choose an inquiry question, method of modelling, and / or investigation that interests you
3) Conduct research, analysing secondary data to help produce a model
4) Use the model to make a prediction
5) Conduct an investigation using the model
6) Communicate the results

Submission components - further information

Part 1 - Literature Review (10 marks)

Students will search for and analyse at least 10 relevant secondary sources to help them create a model for their chosen investigation. They will assess the quality of the information they find including its reliability, validity and relevance.

A maximum of 1000 words is set for the Literature Review.

The following questions should be answered during the Literature Review:

- What concept is explained with the model?
- What types of models could be used (see Scientific Model, below)?
- What are the benefits and limitations of this model?
- What models, theories, laws and / or experiments already exist to explain this concept? Is this an extension, improvement or modification of an existing model?
- What scientists have conducted work on these ideas or models? Give an outline of key dates, experiments, etc.

Part 2 - Scientific Model (20 marks)

A model can be a diagram, a physical replica, a mathematical representation, an analogy or a computer simulation. For this depth study to be successful, the model must be able to make a prediction of some kind that can be tested. The student must create their own version of the model.

Example (mathematical): A student conducts an experiment rolling a ball down a 45^{o} ramp from different heights and measures the time taken. The time appears to obey the formula $t = kh^2$ where k is a number. The student predicts that the time taken to roll down a 2m ramp will be 4k seconds, and conducts an experiment to test this hypothesis.

Example (physical replica): A student creates a model of a diaphragm and lungs using a bottle, rubber and balloons. They use the model to predict that downwards movement of the diaphragm muscle in humans will create low

pressure inside the lungs, causing them to inflate. They demonstrate the model, and analyse secondary data to confirm that this shows the mechanism of inhalation in humans.

Example (diagram): A student creates high quality, 3 dimensional diagrams of the insides of cells using either photographs obtained in the laboratory or secondary data. They use the diagrams to show expected organelles that may be located in animal or plant cells, and conduct investigations to observe them.

There is no limit to the scope or subject of your model, you should choose a scientific idea about which you are interested and investigate it thoroughly.

Part 3 - Verbal Presentation (5 marks)

The model will be presented to an appropriate group of students during Wednesday 25th August double period. The following should be covered:

- Very brief summary of background research
- The purpose of the model
- Process of production
- Predictions made and the outcome of the investigation

Maximum time for the presentation is 5 minutes.

Part 4 - Log book (5 marks)

A log book is to be submitted that details information including, but not limited to:

- ❏ research undertaken
- ❏ evaluation of sources of information
- ❏ dates of when sources were examined and dates for when components of the task were completed
- ❏ photographs of work

Appendix A

Ideas of concepts to model (by no means an exhaustive list)

Chemistry

- reversible reaction/chemical equilibrium
- difference between static equilibrium, dynamic equilibrium and steady state
- covalent and ionic bonding

Biology

- evolution by natural selection
- mitosis and/or meiosis
- disease transmission

Earth and Environmental Science

- physical model tectonic plates
- water cycle
- effect of earthquake waves
- folds vs faults

Physics

- wave/particle duality of light
- transverse vs longitudinal waves
- mathematical/computer graphic model of positive or negative acceleration in cars (eg braking distance from different speeds)

Bibliography Scaffold:

BOOKS				
Author(s)	**Date of publication in brackets**	**Title of book in italics**	**Name of publisher**	
Example: Keay, J.	(2000).	*The Great Arc.*	Harper Collins.	
WEBSITES				
Author	**Date published if available**	**Title of Article**	**Title of website in italics**	**From URL**
	If no date available write (n.d.)			
Example: Landsberger, J.	(n.d.)	Citing Websites.	In *Study Guides and Strategies.*	http://www.studygs.net/citation.htm**.**
MAGAZINES				
Author	**Date**	**Title of Article**	Name of Magazine	Volume, issue, pages
Example: Tumulty, K	(2006, April).	Should they stay or should they go?	*Time*	*167*(15), 3-40.
PERSONAL CONVERSATIONS AND EMAILS				
Person's name	**Date**	**How you know them**	**Nature of communication**	
Example: Mr B. Rock	**12/7/16**	Geologist and uncle	email	
VIDEOS, DVDS, TV SHOWS ETC				
Producer and writer / director or for youtube the person who uploaded video	**Date**	**Title and type of resource**	**Country and company producing video / or the URL**	
Example: Fothergill, A. (producer), Attenborough, D. (narrator).	(2005)	The Blue Planet – Coral Seas [DVD]	UK, BBC.	

Marking Rubric: Depth Study Portfolio and Presentation NAME: _____

Outcomes Assessed:	Task section	Developing	Achieving	High	Exemplary	Total:
INS11 – 1 Develops and evaluates questions and hypotheses for scientific investigation	**Literature review**	• Inquiry question is attempted with some link to model **1 marks**	• Produces a relevant inquiry question **2 marks**	• Produces a relevant and detailed inquiry question **3 marks**		**/3**
INS11 – 8 Identifies that the collection of primary and secondary data initiates scientific investigations		• Secondary sources are referenced • Some link between collected data and student model is present **1 mark**	• Scientific secondary sources are appropriately referenced • Collected data is linked to the development of the student model **2 marks**	• High quality scientific secondary data is collected and appropriately referenced (in text) • Collected data supports the development of the student model **3 Marks**	• Extensive and high-quality scientific secondary data is collected and appropriately referenced (in text) • Collected data deeply supports the development of the student model. **4 marks**	**/4**
INS11 – 9 Examines the use of inferences and generalisations in scientific investigations		• Attempts explanation of how the sources link to the model **1 mark**	• Provides explanation of sources and their application to the development of the model **2 marks**	• Provides a detailed examination of sources and their application to the development of the model **3 marks**	• Provides a highly detailed examination of sources and their application to the development of the model **4 marks**	**/4**
INS11 – 4 Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media	**Presentation of the log book**	• Log book is attempted • Includes some visual representations linked to the model • Description of sources given • Bibliography (less than 3 supplied) **1 mark**	• Log book has all listed elements • Most of the work is neatly presented • Includes a variety of visual representations linked to the model • Evaluation of sources given • Bibliography (4 – 6 supplied) **2-3 marks**	• Log book is detailed including all research undertaken • All work is neatly presented • Includes a variety of visual representations linked to the model • Detailed evaluation of sources • Detailed bibliography (7 – 9 supplied) **4 marks**	• Log book is highly detailed including all research undertaken • All work is neatly presented • Includes a variety of visual representations linked to the creation of the model • Clear and detailed evaluation of sources • Detailed bibliography (minimum 10 supplied) **5 marks**	**/5**
					Page Total	**/16**

Outcomes Assessed:	Task section	Developing	Achieving	High	Exemplary	Total:
INS11 – 10 Develops, and engages with, modelling as an aid in predicting and simplifying scientific objects and processes	Model	• Produces a model to demonstrate a simple scientific idea • Model is related to chosen concept **1 - 3 marks**	• Produces a model to demonstrate a scientific idea • Articulates the purpose and / or limitations of specific models • Model is effective at demonstrating the chosen concept **4 - 6 marks**	• Produces an effective model to demonstrate a scientific idea • Clearly articulates the purpose and / or limitations of specific models • Model is effective at demonstrating the chosen concept **7 - 8 marks**	• Produces a sophisticated model to demonstrate a complex scientific idea. • Clearly articulates the purpose and limitation of specific models • Model is novel and highly effective at demonstrating the chosen concept **9 – 10 marks**	**/10**
INS11 – 6 Solves Scientific understanding using primary and secondary data, critical thinking skills and scientific processes	**Presentation to the teacher (discussion)**	• Links discussion to bibliography • Links to the portfolio and bibliography **1 mark**	• Links discussion to bibliography (5 sources) • Links to the portfolio and bibliography • Presented with some confidence • Easy flowing discussion **2 marks**	• Links discussion to bibliography (5 - 9 sources) • Good use of the portfolio and bibliography, uses the portfolio as a medium to engage the audience • Presented with some confidence and good eye contact • Easy flowing discussion **3 marks**	• Links discussion to a completed bibliography (minimum 10 sources) • Effective use of the portfolio and bibliography, uses the portfolio as a medium to engage the audience • Presented with confidence and good eye contact • Discussion sounds natural and not read off palm cards **4 marks**	**/4**
					Page Total	**/14**

Outcomes Assessed:	Task section	Developing	Achieving	High	Exemplary	Total:
INS11 – 7 Communicates scientific understanding using suitable language and terminology for a specific audience or purpose	**Presentation to the class**	• Limited understanding of the depth study analysis and the concepts involved • Minimal use of scientific terminology **1 - 2 mark**	• Demonstrates a good level of knowledge of the depth study analysis • Students uses some scientific terminology • Demonstrates some understanding of the concepts involved in the depth study analysis **3 marks**	• Through discussions with the teacher during the presentation, student demonstrates a high level of knowledge of the depth study analysis • Students uses some scientific terminology • Demonstrates a good understanding of the concepts involved in the depth study analysis **4 marks**	• Through discussions with the teacher during the presentation, student demonstrates a deep knowledge of the depth study analysis • Students use of scientific terminology is at an exemplary level • Student can demonstrate an exemplary understanding of the concepts involved in the depth study analysis **5 marks**	**/5**
					Total marks	**/40**

Teacher Feedback:

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