Gorokan High School

Assessment Task Notification

RESPECT | RESPONSIBILITY | PERSONAL BEST

Faculty: Science	**Course: Stage 6 - Year 11**	**Time allowed: 7 weeks**
Teacher: Mesina		**Email: frank.mesina@det.nsw.edu.au**
Task number: 2	**Title: Depth Study Presentation**	
Year: 11	**Due date: 31 July 2024**	**Weighting: 30%**

Syllabus outcomes assessed:

INS11/12-1	Develops and evaluates questions and hypotheses for scientific investigations
INS11/12-2	Designs and evaluates investigations in order to obtain primary and secondary data and information
INS11/12-3	conducts investigations to collect valid and reliable primary and secondary data and information
INS11/12-4	selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
INS11/12-5	analyses and evaluates primary and secondary data and information
INS11/12-6	solves scientific problems using primary and secondary data, critical thinking skills and scientific processes
INS11/12-7	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

21st Century and employment related skills:

☒	Communication	☒	Use of technology
☒	Critical Thinking	☒	Self-reflection and refinement
☐	Creativity	☒	Problem Solving
☐	Collaboration	☐	Initiative and Enterprise
☒	Planning and Organising	☐	Cross-Cultural Understanding

Task description:

Depth studies provide opportunities for students to pursue their interests in Investigating Science, acquire a depth of understanding, and take responsibility for their own learning. Depth studies promote differentiation and engagement, and support all forms of assessment, including assessment for, as and of learning. Depth studies allow for the demonstration of a range of Working Scientifically skills.

Students will research and demonstrate their understanding of Topic 2 in the Year 11 Investigating Science course by constructing an examination that tests each dot point of this topic. Students will also provide an answer key.

Assessment criteria:

You will be assessed on your ability to: See attached criteria

Method of task submission:

Hand in to Library Wednesday 31 July 2024 (Wednesday, Term 3 Week 2)

Marking guidelines:

Grade	Descriptor	Mark
A		
B		
C		
D		
E		
N (Stages 5 and 6)		

2024

Depth Study Presentation

Year 11 Cause and Effect

Inferences and Generalisations

Exam Creation

INVESTIGATING SCIENCE

General Instructions

- Board approved calculators may be used
- Write using black or blue pen
- Draw diagrams using pencil/black pen
- Computer presented document acceptable
- Write your student name at the top of every page that you submit.

Total Marks = 66
(30% of Course Assessment)

Attempt all Questions

STUDENT NAME_____

Year 11 Investigating Science Depth Study 2024

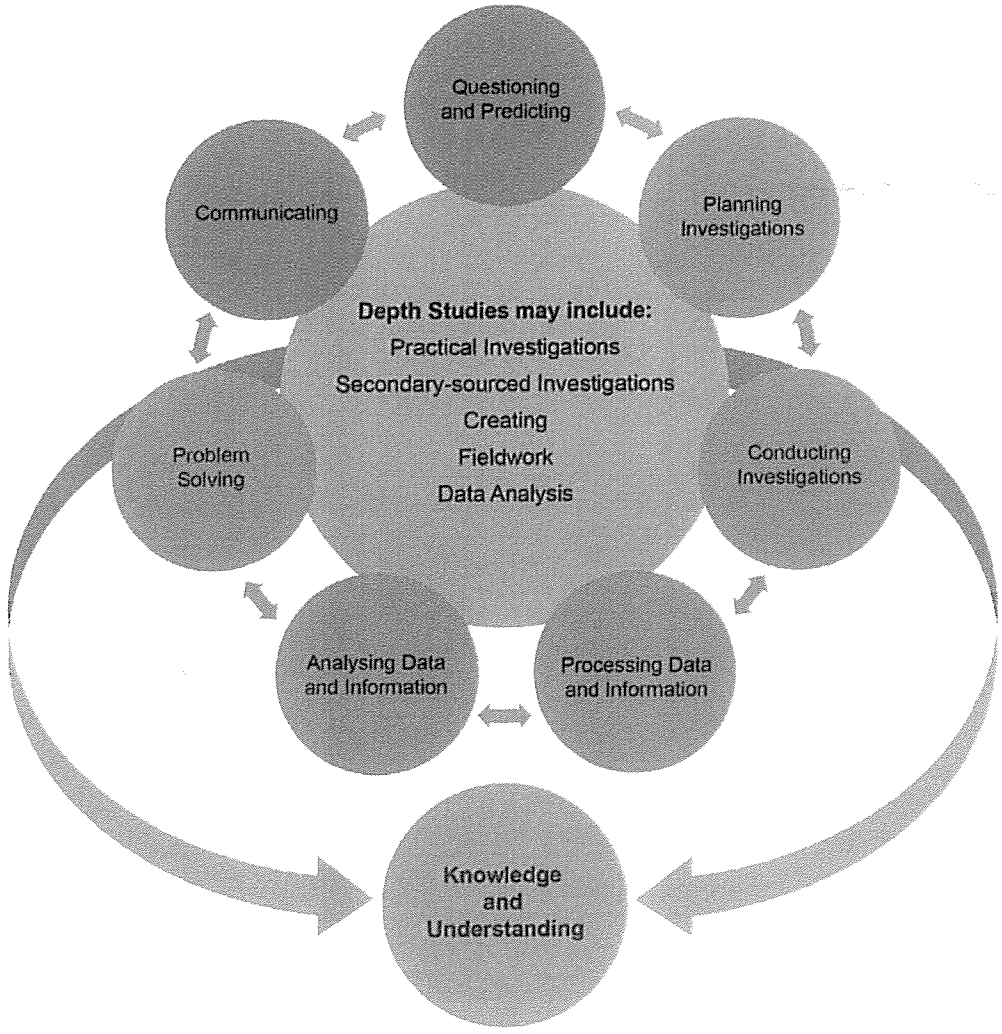
A depth study is any type of investigation/activity that a student completes individually or collaboratively that allows the further development of one or more concepts found within or inspired by the syllabus. It may be one investigation/activity or a series of investigations/activities.

Depth studies provide opportunities for students to pursue their interests in physics, acquire a depth of understanding, and take responsibility for their own learning. Depth studies promote differentiation and engagement, and support all forms of assessment, including assessment for, as and of learning. Depth studies allow for the demonstration of a range of Working Scientifically skills.

The length of time for any individual study and the pedagogies employed are not prescribed. The time for the depth studies may be allocated to a single study or spread over the year, and incorporate several studies depending on individual school and/or class requirements.

Requirements for Depth Studies

- A minimum of 15 hours of in-class time is allocated in both Year 11.
- At least one depth study must be included in Year 11.
- The two Working Scientifically outcomes of Questioning and Predicting and Communicating must be addressed in Year 11.



Assessment of Depth Studies must:

- address Questioning and Predicting, and Communicating skills outcomes
- address a minimum of two additional Working Scientifically skills outcomes
- include assessment of at least one Knowledge and Understanding outcome.

- A minimum of two additional Working Scientifically skills outcomes, and further development of at least one Knowledge and Understanding outcome, should be addressed in all depth studies.

Each of the seven Working Scientifically outcomes represents one of the interdependent dynamic processes that are central to the study of Science and the acquisition of scientific knowledge and skills. This course is structured to provide ongoing opportunities for students to implement these processes, particularly through the depth study provision. The following descriptions of the Working Scientifically outcomes provide further information about the skills students are expected to develop throughout the course.

Your Task:

1. **You are to construct an exam that has Multiple Choice questions, Short answer or problem-solving questions based on the second topic Cause and Effect – Inferences and Generalisations.**
2. **You will have to provide an Answer Key for the exam you prepare.**
3. **There must be at least FOUR (4) problem solving/calculation questions. The rest can be multiple choice.**
4. **This Depth Study will form part of your formal assessment, so must be completed as part of your course.**

This task is due Wednesday Week 2 -Term 3, 31 July 2024, to Library by 8:20am.

Cause and Effect – Inferences and Generalisations

Scientific inquiry follows on from humans making inferences and generalisations from commonly held understandings. Such inferences and generalisations have led to a wide range of investigations being performed throughout history, culminating in breakthroughs in scientific understanding. Many hypotheses, when found to be correct, have generated further inquiry and created the need to develop new technologies for further observation.

Students consider primary and secondary-sourced data and its influence on scientific investigations. In this module, students engage in gathering primary and secondary-sourced data to assist them in conducting and reporting on investigations, and to further develop their understanding of the central roles of scientific questioning and collaboration in the pursuit of scientific truth.

Your task requires you to make:

- Two (2) questions that investigate the practices of Aboriginal and Torres Strait Islander Peoples that relate to observations and inferences, including but not limited to:
  - leaching of toxins in bush tucker
  - locating sources of freshwater within bodies of salt water

- Two (2) questions that describe patterns that have been observed over time throughout the Universe and in nature using, for example:
  - animal migration
  - movement of comets
  - formation and shape of snow crystals
  - elements exhibiting certain properties
- Two (2) questions that propose a hypothesis based on an irregular pattern observed over time in the Universe and in nature using, for example:
  - the Aurora Australis
  - fractals in nature
  - the behaviour of unstable isotopes
- One (1) question that examines the human tendency to observe patterns and misinterpret information, for example:
  - pareidolia
  - optical illusions

- One (1) question that discusses how the tendency to recognise patterns, even when they may not exist, can lead to misinterpretation of data
- One (1) question that discusses the role and significance of outliers in data

- Two (2) questions that describe historical instances of long-standing assumptions that have been updated by scientific investigation, including but not limited to:
  - spontaneous generation and the investigations that led to the proposal of the germ theory
  - radioactivity: including the work of Henri Becquerel and Marie Curie
  - phlogiston theory
  - human influences on atmospheric pollution
- Two (2) questions that construct a hypothesis and conduct an investigation that tests a common assumption, for example:
  - washing with antibacterial soap kills more germs than washing with normal soap
  - the Sun rises in the East and sets in the West
  - what goes up must come down

- Two (2) questions that assess the input that collaborative teams and alternative perspectives have had on the development of hypotheses and research questions that have contributed to the development of, for example:
  - particle accelerators
  - periodic table
  - study of bioastronomy
  - geological uniformitarianism
- Two (2) questions that assess the scientific community's current understanding of scientific mysteries and outline why this understanding remains incomplete, including but not limited to:
  - origins of life on the Earth
  - the idea that feynmanium is the last chemical on the periodic table that could exist
  - the expanding Universe and Hubble constant
- One (1) question that evaluates biases that may have affected the scientific thinking of European settlers about Aboriginal and Torres Strait Islander Peoples' ecological understanding and knowledge of Country and Place in relation to agricultural practices and the biological and natural resources of Australia

Investigating Science – Year 11 ASSESSMENT TASK Depth Study - Task 2								
Outcome	Question	Assessment Criteria	Marks					
			1	2	3	4	5	
INS11-8	1	**Question** tests the practices of Aboriginal and Torres Strait Islander Peoples that relate to observations and inferences *(and gives a correct answer)*	1	2				
INS11-8	2	**Question** tests the practices of Aboriginal and Torres Strait Islander Peoples that relate to observations and inferences *(and gives a correct answer)*	1	2				
INS11-9	3	**Question** tests describe patterns that have been observed over time throughout the Universe and in nature using *(and gives a correct answer)*	1	2				
INS11-9	4	**Question** tests describe patterns that have been observed over time throughout the Universe and in nature using *(and gives a correct answer)*	1	2				
INS11-9	5	**Question** tests propose a hypothesis based on an irregular pattern observed over time in the Universe and in nature *(and gives a correct answer)*	1	2				
INS11-9	6	**Question** tests propose a hypothesis based on an irregular pattern observed over time in the Universe and in nature *(and gives a correct answer)*	1	2				
INS11-9	7	**Question** tests the human tendency to observe patterns and misinterpret information *(and gives a correct answer)*	1	2				
INS11-9	8	**Question** tests how the tendency to recognise patterns, even when they may not exist, can lead to misinterpretation of data *(and gives a correct answer)*	1	2				
INS11-9	9	**Question** tests the role and significance of outliers in data *(and gives a correct answer)*	1	2				
INS11-9	10	**Question** tests the historical instances of long-standing assumptions that have been updated by scientific investigation *(and gives a correct answer)*	1	2				
INS11-9	11	**Question** tests the historical instances of long-standing assumptions that have been updated by scientific investigation *(and gives a correct answer)*	1	2				
INS11-9	12	**Question** tests a hypothesis and conduct an investigation that tests a common assumption *(and gives a correct answer)*	1	2				
INS11-9	13	**Question** tests a hypothesis and conduct an investigation that tests a common assumption *(and gives a correct answer)*	1	2				
INS11-9	14	**Question** tests $\sum m\,\vec{v}_{\text{before}} = \sum m\,\vec{v}_{\text{after}}$; conservation of momentum *(and gives a correct answer)*	1	2				
INS11-9	15	**Question** tests the input that collaborative teams and alternative perspectives have had on the development of hypotheses and research questions that have contributed to the developments *(and gives a correct answer)*	1	2				
INS11-9	16	**Question** tests the input that collaborative teams and alternative perspectives have had on the development of hypotheses and research questions that have contributed to the developments *(and gives a correct answer)*	1	2				
INS11-9	17	**Question** tests the scientific community's current understanding of scientific mysteries and outline why this understanding remains incomplete *(and gives a correct answer)*	1	2				
INS11-9	18	**Question** tests the scientific community's current understanding of scientific mysteries and outline why this understanding remains incomplete *(and gives a correct answer)*	1	2				

INS11-9	19	**Question** tests how biases may have affected the scientific thinking of European settlers about Aboriginal and Torres Strait Islander Peoples' ecological understanding and knowledge of Country and Place in relation to agricultural practices and the biological and natural resources of Australia *(and gives a correct answer)*	1	2			
IN11/12-1		***Develops*** and *evaluates* questions for scientific investigation	1	2	3	4	
IN11/12-2		***Designs*** and ***evaluates*** questions in order to obtain primary and secondary data and information	1	2	3	4	
IN11/12-3		***Evaluates*** investigations as valid and reliable primary and secondary data and information	1	2	3	4	
IN11/12-4		***Selects*** and ***processes*** appropriate qualitative and quantitative data and information using a range of appropriate media	1	2	3	4	
IN11/12-5		***Analyses*** and ***evaluates*** primary and secondary data and information	1	2	3	4	
IN11/12-6		***Solves*** scientific problems using primary and secondary data, critical thinking skills and scientific processes	1	2	3	4	
IN11/12-7		***Communicates*** scientific understanding using suitable language and terminology for a specific audience or purpose	1	2	3	4	
		1 = developing; 2= shows research; 3 = consistent; 4 = highly developed	**Total:**			**/ 66**	