Notice of Assessment Task
HSC Physics
Task 2 – Depth Study

Date of initial notification: Tuesday 20 February 2024 Week 4, Term 1	Date of submission of task: Thursday 14 March 2024 Week 7, Term 1

Teacher: Miss Nunes	Task Number: 2

Time Allowed: 4 Weeks	Weighting of task: 30%

Course Component/Focus area/topic/module: Module 5 – Advanced Mechanics

Task Description

In this **_Depth Study_** you will be working independently to investigate the following inquiry question:

Why do objects move in circles?

You are to analyse the physics involved with TWO rides at Luna Park, submit a scientific report and respond to HSC style questions in an in-class component.

This will involve two parts:

PART A
- Researching the construction of the ride using secondary sources.
- Taking data measurements that allow you to calculate various variables.
- Participating in the ride to observe the effects on your body and align them to your quantitative analysis.

PART B:
- Respond to two HSC style questions relevant to the Module 5 course material.

You will be assessed on:
- The modification of the inquiry question into a suitable hypothesis.
- The location of suitable secondary resources, analysing the physics principles involved in the rides of your choice.
- Producing a methodology to test the hypothesis.
- Demonstration of understanding of the Physics involved.
- The communication of your findings which include a discussion on the validity and reliability of your investigations.
- Your ability to respond to HSC questions.

<u>Task Outline</u>
- Students engage in a mandatory excursion to Luna Park and participate in various rides.
- Students complete and submit Luna Park workbook.
- Students complete a scientific report on two chosen rides.
- Students complete two HSC style questions.

<u>Instructions</u>
- Ensure your name, class, and teacher is clearly labelled.
- The Scientific Report is to be submitted on Google Classroom before 2:50 PM on the day of submission. The HSC questions are to be submitted in the allocated lesson.
- All work submitted must be original and completed individually.
  (NOTE: Any work deemed to be plagiarised will be treated as a non-serious attempt and dealt an appropriate consequence in accordance with the school and faculty policy)

Outcomes/Competencies to be assessed in this task:

PHY12-1 – develops and evaluates questions and hypotheses for scientific investigation.
PHY12-4 – selects and processes appropriate qualitative and qualitative data and information using a range of appropriate media.
PHY12-5 – designs and evaluates investigations in order to obtain primary and secondary data and information.
PHY12-7 – communicates scientific understanding using suitable language and terminology for a specific audience or purpose.
PHY12-12 – describes and analyses qualitatively and quantitatively circular motion and motion in a gravitational field, in particular, the projectile motion of particles.

Feedback: How will I receive feedback on this task?

☒ Written

☒ Whole class

Year 12 Physics – Depth Study Marking Guidelines

	Limited	Basic	Sound	High	Outstanding
Abstract	*Summary does not reflect Depth Study*	*Summary reflects aspects of the Depth Study*	*Summary that reflects most aspects of the Depth Study*	*Summary of the Depth Study with reference to the inquiry question, methodology, results, and conclusion*	*clear and succinct summary of the Depth Study with reference to the inquiry question, methodology, results and conclusion*
	0 marks	*1 mark*	*2 marks*	*3 marks*	*4 marks*
Introduction	*Formulates a hypothesis with limited understanding of the inquiry question* *Demonstrates limited knowledge and understanding of mechanics*	*Formulates a hypothesis linked to the inquiry question with teacher assistance.* *Demonstrates basic knowledge and understanding of mechanics and how they relate to a chosen ride with some attempt to use key terminology and no use of formulae.*	*Formulates hypothesis linked to the inquiry question.* *Demonstrates sound knowledge and understanding of mechanics and how they relate to the chosen rides using some key terminology and formulae.* *Demonstrates sound knowledge of the rides examined using some key terminology and formulae.*	*Formulates an appropriate hypothesis linked to the inquiry question.* *Demonstrates thorough knowledge and understanding of mechanics and how they relate to the chosen rides using key terminology and formulae.* *Demonstrates thorough knowledge and understanding of the rides examined and related this to their experiences using key terminology and formulae.*	*Formulates an appropriate hypothesis that is evidence based and clearly links to the inquiry question.* *Demonstrates extensive knowledge and understanding of mechanics and how they relate to the chosen rides using key terminology, formulae, and calculations.* *Demonstrates extensive knowledge and understanding of the rides examined and relates this to their experiences using key terminology, relevant formulae, and calculations*
	1 mark	*2 – 3 marks*	*4 marks*	*5 marks*	*6 marks*

Materials & Method				
Does not provide a risk assessment and requires teacher direction when using equipment. Experimental procedure developed lacks experimental controls. Methodology does not allow for the collection of reliable data does not select appropriate technologies to ensure accurate data collection.	Minimal identification of risks with some appropriate materials Experimental procedure developed contains some experimental controls needs teacher assistance to recognise. methodology requires repetition to collect reliable data seeks teacher assistance to select technologies.	Identifies risks to select mostly appropriate materials and plan a safe investigation. Experimental procedure developed contains most necessary experimental controls. Develops a methodology that includes minimal repetition. Selects basic forms of technology with minimal improved accuracy.	Assesses risks to select appropriate materials and plan a safe investigation. Implements appropriate experimental controls. Develops a methodology that includes some repetition. Selects technology to improve the precision of data collected.	Thoroughly assesses risks to select appropriate materials and plan a safe investigation. Implements appropriate experimental controls to ensure a valid procedure. Develops a methodology that allows for the reliable collection of data. Appropriate selection of technologies to ensure precision.
1 – 2 marks	*3 – 4 marks*	*5 – 6 marks*	*7 – 8 marks*	*9 – 10 marks*
Results				
Unable to distinguish between relevant and non-relevant quantitative data. Data is disorganised and not represented in appropriate formats.	Selects quantitative data. Data is represented in a logical format.	Selects mostly relevant quantitative data. Represents most quantitative data in a range of appropriate formats. Applies some quantitative processes	Selects relevant quantitative data. Represents quantitative data in a range of appropriate formats. Applies quantitative process where appropriate	Selects relevant quantitative data. Represents quantitative data in a range of appropriate formats using digital technologies. Applies quantitative process where appropriate.
1 – 2 marks	*3 – 4 marks*	*5 marks*	*6 marks*	*7 – 8 marks*

Discussion	Presents data with limited information. Demonstrate minimal critical thinking	Attempts to describe primary data; - Identifies some trends, patterns, and relationships. - Identifies some error, uncertainty, and limitations in data. - Outlines the relevance, accuracy, validity, and reliability of data. Suggests some improvements to investigations Attempts to solve problems	Some analysis of primary data; - Describes most trends, patterns, and relationships. - Discusses most errors, uncertainty, and limitations in data. - Discusses the relevance, accuracy, validity, and reliability of data suggests improvements to investigations with some justification. Demonstrates some critical thinking to solve problems. Some attempt to link data with secondary sourced data	Analyses and evaluates primary data; - Explains trends, patterns, and relationships in data. - Discusses error, uncertainty, and limitations in data. - Discusses the relevance, accuracy, validity, and reliability of data. - Suggests and justifies most improvements to investigations. Solves problems using critical thinking skills sound linkage of data with secondary sourced data	Thoroughly analyses and evaluates primary data; - Derives and explains trends, patterns, and relationships in data. - Assesses error, uncertainty, and limitations in data. - Assesses the relevance, accuracy, validity, and reliability of data. Suggests and justifies improvements to investigations. Solves problems using critical thinking skills and scientific processes thorough linkage of data with secondary sourced data
	0 – 2 marks	*3 – 5 marks*	*6 – 8 marks*	*9 – 10 marks*	*11 – 12 marks*
Conclusion	Conclusion does not reflect the investigation and does not link to hypothesis.	Conclusion reflects aspects of the investigation and makes attempt to reference hypothesis	Constructs a conclusion that is based on some evidence and references the hypothesis.	Constructs an evidence-based conclusion by analysing scientific relationships, describing general trends, and making direct reference to the hypothesis.	Constructs evidence-based conclusions by analysing and evaluating complex scientific interrelationships, with clear description of trends, and direct reference to the hypothesis.
	0 marks	*1 mark*	*2 marks*	*3 marks*	*4 marks*

- If you are absent on the day that the task is due, you MUST see your teacher the next day (not your next lesson) that you are present at school to show your medical certificate or produce a misadventure form (refer to your Assessment Booklet for a copy of the form).
- Exemptions and extensions for any other reason will only be determined at the discretion of the Head Teacher, and only in extenuating circumstances. You must advise the Head Teacher as soon as possible if you know you are unable to submit the task on the due date.
- All appeals must be lodged within 48hrs of receipt of the task. Students who may consider an appeal are not permitted to take their task home. The original task cannot be altered in any way prior to the appeal process. See Assessment booklet for details.

References & Presentation					
	Presents a report that lacks any structure. *Communicates using basic language.* *Provides a reference list.* *Selects secondary resources.*	*Presents a report that follows some guidelines.* *Uses basic language with some limited scientific terminology and information.* *Includes some scientific notations and nomenclature.* *Provides a reference list attempting to use the appropriate reference style.* *Selects some appropriate secondary sources*	*Presents a report that mostly follows the guidelines provides.* *Uses language that is mostly clear and relevant with some accurate scientific terminology and information.* *Includes mostly appropriate scientific notations and nomenclature.* *Provides an accurate reference list using the Harvard Referencing Style* *Selects relevant and reliable secondary sources*	*Presents a well-organised report that follows the guidelines provided.* *Communicates scientific understanding using language that is mostly clear with accurate and relevant scientific terminology and information.* *Includes mostly appropriate scientific notations and nomenclature.* *Provides an accurate reference list using the Harvard Referencing Style* *Selects a variety of relevant, up to date and reliable secondary sources.*	*Presents a logical and cohesive report that follows the guidelines provided.* *Communicates scientific understanding effectively using language that is clear and succinct including accurate relevant scientific terminology and information.* *Selects appropriate scientific notations and nomenclature to communicate scientific concepts related to equilibrium.* *Provides an accurate reference list using the Harvard Referencing Style* *Selects a variety of relevant, up to date and reliable secondary sources.*
	1 mark	2 marks	3 – 4 marks	5 marks	6 marks
			Mark	*Percentage*	*Rank*

Feedback