

Assessment Notification – Depth Study

Year: 12 Subject: Physics Task No: 2

Task title	Electromagnetic Induction Depth Study		
Date issued	Friday, 7 March 2025	Weighting	35%
Due date	Thursday, 10 April 2025	Total marks	40

Outcomes:

PH11/12-1 develops and evaluates questions and hypotheses for scientific investigation
 PH11/12-2 designs and evaluates investigations in order to obtain primary and secondary data and information
 PH11/12-3 conducts investigations to collect valid and reliable primary and secondary data and information
 PH11/12-4 selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
 PH11/12-5 analyses and evaluates primary and secondary data and information
 PH11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose
 PH12-13 explains and analyses the electric and magnetic interactions due to charged particles and currents and evaluates their effect both qualitatively and quantitatively

Context:

As part of the Stage 6 Science courses, students are required to complete a depth study. They are completing a Module investigating electromagnetics, and this depth study provides the students with the opportunity to investigate variables that impact the creation of emf.

Description of the task:

The aim of this investigation is to use computer software to analyse the relationship between voltage and magnetic flux, time and coils of wire. You will need to develop an inquiry question that investigates the relationship between two variables. See the attached Practical activity to help you start planning your depth study.

You will have access to a voltage data logger, solenoids, magnets and general lab equipment as required.

Lesson Sequence	
Week 6	1 period – task introduction 1 period – equipment familiarisation and development of inquiry question
Week 7	2 periods – data collection
Week 8	2 period – data collection
Week 9	2 periods – data collection/report writing
Week 10	2 periods – complete scientific report
Week 11	Submit Report

Guidelines for writing a scientific report

Introduction (400 words maximum)

A summary linking the practical activity to scientific theory.

Aim

Clearly stated, specific sentence or two describing what the experiment intends to investigate.

Hypothesis

Clearly stated, educated prediction of your results. This sentence should include a relationship between the dependent and independent variables.

Materials

Details of all the materials and quantities required for your experiment.

Method

- Detailed, logical experimental procedure.
- Includes a diagram/s to show how equipment is set up.
- Includes any safety considerations you need to consider.
- Has a control for the experiment (if necessary).
- Includes a risk assessment.
- Includes a variables table.

Results

- Contains all the calculations you might need to make to form results.
- Clear statements of what you observed during the experiment and at its conclusion.
- Suitable tables and graphs are used and referred to in the text.

Discussion (1200 words maximum)

- Using scientific concepts, explain the patterns, trends or relationships you have identified in your data.
- Compare experimental results with theoretical results
- Outline any actual and possible errors that may have affected your results.
- How could the design of the experiment have been improved to reduce error?
- Outline how your results might be valuable/useful.
- An evaluation of the hypothesis that leads to suggested further experiments
- Assessment of the reliability and validity of the experiment

Conclusion

States whether the aim/hypothesis was achieved/supported or not.

Bibliography

Includes all the reference material used in alphabetical order.

Appendix

This should include your raw data, table and graphs

Marking criteria:

See attached rubric

Feedback provided:

Written feedback and a grade will be provided on Canvas and Edumate

Submission details:

Upload report to Canvas by 10.00pm 10th April 2025

Faculty Leader approval:

Students are reminded of the rules and requirements relating to completion, submission and absences for assessment tasks.



Faculty Leader approval

Depth Study: Projectile Motion Marking Guide

Working scientifically	Extensive 5	Thorough 4	Sound 3	Basic 2	Elementary 1	Insufficient evidence 0
QUESTIONING AND PREDICTING PH11/12-1	Clearly state the purpose of the experiment and formulate a hypothesis that predicts the outcome of the experiment based on research from the introduction and scientific reasoning.	State the purpose of the experiment and formulate a hypothesis that predicts the outcome of the experiment based on scientific principles discussed in the introduction.	State the purpose of the experiment or formulate a hypothesis that predicts the outcome of the experiment based on research.	State the purpose of the experiment or formulate a hypothesis that predicts the outcome of the experiment.	State the purpose of the experiment.	Insufficient evidence
PLANNING INVESTIGATIONS PH11/12-2	Design a method that is clear and replicable, set out appropriately using numbered steps and will achieve the aim/hypothesis. The method is accurate, reliable and valid, and includes diagrams to show equipment set up. Method includes consideration and evaluation of the potential risks associated with the investigation	Design a method that is clear and replicable, using numbered steps and will achieve the aim/hypothesis. The method is accurate and reliable. Risk assessment is well-considered and included in the method	Design a method that is clear and replicable. The method has sound accuracy and reliability Risk assessment is included	Designs a reliable method with number steps. States a potential risk of the experiment	States some aspects of a method	Insufficient evidence
CONDUCTING INVESTIGATIONS PH11/12-3	This section is a teacher's judgment on your demonstration of safe work practices, use of technology and collaboration					
RECORDING RESULTS PH11/12-4	Accurately record experimental observations, effectively organise data in appropriate tables and display results in appropriate graphs	Record experimental observations, organise data in an appropriate table and display results in graphical form.	Record experimental observations, organise data in a table and graph	Record experimental observations, organise data in a table	Record some experimental observations	Insufficient evidence
ANALYSING DATA AND INFORMATION PH11/12-5	An extensive evaluation of the collected data. Including: <ul style="list-style-type: none"> identification of patterns and relationships in the data 	A thorough evaluation of the collected data. Including: <ul style="list-style-type: none"> identification of patterns and relationships in the data 	A sound evaluation of the collected data. Including: <ul style="list-style-type: none"> identification of patterns and relationships in the data 	A basic evaluation of the collected data. Including: <ul style="list-style-type: none"> identification of a pattern or relationship in the data 	A elementary evaluation of the collected data. Including: <ul style="list-style-type: none"> identification of a pattern in the data 	Insufficient evidence

	<ul style="list-style-type: none"> derive trends and link these back to the physics theory <p>The DISCUSSION will contain an extensive assessment of:</p> <ul style="list-style-type: none"> accuracy reliability validity 	<ul style="list-style-type: none"> Patterns in data are linked back to the physics theory <p>The DISCUSSION will contain a thorough assessment of:</p> <ul style="list-style-type: none"> accuracy reliability validity 	<p>The DISCUSSION will contain a sound assessment of:</p> <ul style="list-style-type: none"> accuracy reliability validity 	<p>The DISCUSSION will contain a basic assessment of:</p> <ul style="list-style-type: none"> reliability accuracy 	<p>The DISCUSSION will contain limited assessment of the reliability or accuracy.</p>	
COMMUNICATING	<p>The report will:</p> <ul style="list-style-type: none"> state a conclusion with reference to the hypothesis. use detailed and labelled diagrams throughout the report. consistently use correct SI units and conventions throughout report. <p>acknowledged resources used appropriately and in alphabetical order.</p>	<p>The report will:</p> <ul style="list-style-type: none"> state a conclusion with reference to the hypothesis. use detailed and labelled diagrams throughout the report. <p>acknowledged resources used with some errors.</p>	<p>The report will:</p> <ul style="list-style-type: none"> state a conclusion with reference to the hypothesis. <p>acknowledged resources used with some errors.</p>	<p>The report will:</p> <ul style="list-style-type: none"> state a conclusion but not reference the hypothesis. <p>acknowledged resources used with major errors.</p>	<p>The report will:</p> <ul style="list-style-type: none"> state a conclusion but not reference the hypothesis. <p>OR</p> <p>acknowledged resources used with major errors.</p>	Insufficient evidence
Knowledge and understanding	Extensive 10-9	Thorough 8-7	Sound 6-5	Basic 4-3	Elementary 2-1	Insufficient evidence
<i>INTRODUCTION AND DISCUSSION</i>	<p>INTRODUCTION will contain:</p> <ul style="list-style-type: none"> an extensive summary of the physics theory addressed in the depth study and how this is applied throughout the experiment <p>The DISCUSSION will contain: an extensive use of scientific concepts to explain the patterns, trends or relationships identified in the data.</p>	<p>The INTRODUCTION will contain:</p> <ul style="list-style-type: none"> a thorough summary of the physics theory addressed in the depth study and how this is applied throughout the experiment <p>The DISCUSSION will contain: a thorough use of scientific concepts to explain the patterns, trends or relationships identified in the data.</p>	<p>The INTRODUCTION will contain:</p> <ul style="list-style-type: none"> a sound summary of the physics theory addressed in the depth study and how this is applied throughout the experiment <p>The DISCUSSION will contain: a sound use of scientific concepts to explain the patterns, trends or relationships identified in the data.</p>	<p>The INTRODUCTION will contain:</p> <ul style="list-style-type: none"> a basic summary of the physics theory addressed in the depth study and how this is applied throughout the experiment <p>The DISCUSSION will contain: a basic use of scientific concepts to explain the patterns, trends or relationships identified in the data.</p>	<p>The INTRODUCTION will contain:</p> <ul style="list-style-type: none"> an elementary summary of the physics theory addressed in the depth study <p>The DISCUSSION will contain: an elementary use of scientific concepts to explain the patterns, trends or relationships identified in the data.</p>	Insufficient evidence