

PRACTICAL FIRST-HAND INVESTIGATION

Weighting: 30%

TOPIC: Magnetism

**Due Date: Before 9am in G3 on Friday 23rd July 2021 - Week 2
Term 3**

Task Overview:

This task contains three parts.

PART 1 – Developing scientific questions

To complete this task you will be required to develop two scientific questions that can be researched. The first question must be on the application of magnetic fields in nature, and the second question must be on the application of magnetic fields in technology.

PART 2 - Conducting research using secondary sources

To complete this task you are required to use a variety of secondary sources to conduct research on the two scientific questions that you have developed.

You will be required to present your research as a scientific research report using appropriate headings and sub headings.

PART 3 – Creating a model

To complete Part Three of this task, you will be required to choose one of the applications of magnetic fields that you researched. You will then be required to design and create a model which demonstrates and explains how your chosen magnetic field performs its function.

Both your model and your scientific research report will need to be submitted for marking.

Syllabus Outcomes:

PH11 – 1 Develops and evaluates questions and hypotheses for scientific investigation

PH11 – 2 Designs and evaluates investigations in order to obtain primary and secondary data and information

PH11 – 3 Conducts investigations to collect valid and reliable primary and secondary data and information

PH11 – 4 Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media

PH11 – 5 Analyses and evaluates primary and secondary data and information

PH11 – 6 Solves scientific problems using primary and secondary data, critical thinking skills and

scientific processes

PH11 – 7 Communicates scientific understanding using suitable language and terminology for a specific audience or purpose

Non-submission: non-submission of the task or the late submission of the task will result in a mark of zero, unless appropriate misadventure forms and documentation are completed.

Plagiarism: All sources must be acknowledge appropriately in accordance with All My Own Work.

PART 1 – Developing a question to be researched – to be completed in class using the attached scaffold.

Part One of this task focuses on your scientific skills in developing and evaluating questions to be investigated. You must develop two questions to be research: one focusing on the application of magnetic fields on nature and one focusing on the application of magnetic fields in technology.

Developing a question can be difficult. If the question is too broad or unclear it can be difficult to research and answer. Use the following steps to assist you in developing your two research questions. You must submit both of your completed scaffolds.

Steps to developing a research question:

- **Choose an interesting general topic.** This has already been chosen for you. The topic is magnetism. You will need to develop two research questions. One on the application of magnetic fields in nature and one on the application of magnetic fields in technology.
- **Do some preliminary research on your general topic.** Do a few quick searches on your topic. This will assist in narrowing down your topic and areas for research.
- **Consider your audience.** Always keep your audience in mind when narrowing your topic and developing your question. Would that particular audience be interested in this question?
- **Start asking questions.** Taking into consideration all of the above, start asking yourself open-ended “how” and “why” questions about your general topic. For example, “How are electromagnets used in modern technology” or “Why are electromagnets used over permanent magnetism in some devices?”
- **Evaluate your question.** After you’ve got a question or even a couple of question down on paper, evaluate these questions to realize if they would be effective research questions or if they need more revising.

o Is your research question clear? With so much research available on any given topic, research questions must be as clear as possible in order to be effective in helping the writer direct his or her research.

- o Is your research question focused?
- o Research questions must be specific enough to be well covered in the space available.
- o Is your research question complex? Research questions should not be answerable with a simple “yes” or “no” or by easily-found facts. They should, instead, require both research and analysis on the part of the writer.

Part 2 – Conducting research using secondary sources.

To complete Part 2 of this task you must use a variety of secondary sources to conduct research to answer both of your scientific questions. Your report should be a minimum of 1 page per question. Your report should be structured to contain appropriate headings and subheadings. Include appropriate diagrams and pictures in your report.

You must make sure that your research is written in your own words. You must not cut and paste. You must include a reference page and reference your work using APA 5th referencing style.

Part 3 – Creating a model

To complete Part 3 of this task you must choose ONE application of a magnetic field that you have come across in your research (either natural or man-made). You must design and construct a model to demonstrate and explain how the chosen magnetic field performs its function. You must provide:

- an annotated diagram of your model
- A list of the materials used AND why they are have been used for their specific purpose.
- Write a paragraph evaluating the effectiveness of your model in demonstrating and explaining how the chosen magnetic field performs its function AND outlining any limitations of your model.

Marking Rubric: Part 1 – Developing questions to be researched

Outcomes Assessed:	Outstanding (A)	High (B)	Sound (C)	Basic (D)	Limited (E)	Marks:
PH11 – 1 Develops and evaluates questions and hypotheses for scientific investigation	<ul style="list-style-type: none"> • Develops outstanding questions that can be researched on the application of magnetic fields in nature. • Thoroughly evaluates questions that can be researched. <p style="text-align: center;">(5 marks)</p>	<ul style="list-style-type: none"> • Develops high level questions that can be researched on the application of magnetic fields in nature. • Evaluates questions that can be researched. <p style="text-align: center;">(4 marks)</p>	<ul style="list-style-type: none"> • Develops questions that can be researched on the application of magnetic fields in nature. • Evaluates questions that can be researched. <p style="text-align: center;">(3 marks)</p>	<ul style="list-style-type: none"> • Develops simple questions that can be researched on the application of magnetic fields in nature. • Evaluates some questions that can be researched. <p style="text-align: center;">(2 marks)</p>	<ul style="list-style-type: none"> • Struggles to develop questions that can be researched on the application of magnetic fields in nature. • No evaluation of questions present. <p style="text-align: center;">(1 mark)</p>	
	<ul style="list-style-type: none"> • Develops outstanding questions that can be researched on the application of magnetic fields in technology. • Thoroughly evaluates questions that can be researched. <p style="text-align: center;">(5 marks)</p>	<ul style="list-style-type: none"> • Develops high level questions that can be researched on the application of magnetic fields in technology. • Evaluates questions that can be researched. <p style="text-align: center;">(4 marks)</p>	<ul style="list-style-type: none"> • Develops questions that can be researched on the application of magnetic fields in technology. • Evaluates questions that can be researched. <p style="text-align: center;">(3 marks)</p>	<ul style="list-style-type: none"> • Develops simple questions that can be researched on the application of magnetic fields in technology. • Evaluates some questions that can be researched. <p style="text-align: center;">(2 marks)</p>	<ul style="list-style-type: none"> • Struggles to develop questions that can be researched on the application of magnetic fields in technology. • No evaluation of questions present. <p style="text-align: center;">(1 mark)</p>	

Part 2 – Conducting research using secondary sources

Outcomes assessed:	Outstanding (A)	High (B)	Sound (C)	Basic (D)	Limited (E)	Marks:
<p>PH11 – 3 Conducts investigations to collect valid and reliable primary and secondary data and information</p> <p>PH11 – 4 Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media</p>	<ul style="list-style-type: none"> • Conducts a thorough research investigation to answer scientific question on the application a magnetic fields in nature. • Uses a wide range of reliable and valid secondary sources (7 or more) to gather reliable information. <p>(5 marks)</p>	<ul style="list-style-type: none"> • Conducts a high level research investigation to answer scientific question on the application a magnetic fields in nature. • Uses a wide range of reliable and valid secondary sources (6 or more) to gather reliable information. <p>(4 marks)</p>	<ul style="list-style-type: none"> • Conducts a research investigation to answer scientific question on the application a magnetic fields in nature. • Uses a range of relevant secondary sources (at least 5) to gather reliable information. <p>(3 marks)</p>	<ul style="list-style-type: none"> • Conducts a basic level research investigation to answer scientific question on the application a magnetic fields in nature. • Uses some relevant secondary sources (at least 3) to gather reliable information. <p>(2 marks)</p>	<ul style="list-style-type: none"> • Conducts a limited research investigation to answer scientific question on the application a magnetic fields in nature. • Uses a limited amount of secondary sources (1 – 2 sources) to gather information. <p>(1 mark)</p>	
<p>PH11 – 5 Analyses and evaluates primary and secondary data and information</p>	<ul style="list-style-type: none"> • Conducts a thorough research investigation to answer scientific question on the application a magnetic fields in technology. • Uses a wide range of reliable and valid secondary sources (7 or more) to gather reliable information. <p>(5 marks)</p>	<ul style="list-style-type: none"> • Conducts a high level research investigation to answer scientific question on the application a magnetic fields in technology. • Uses a wide range of reliable and valid secondary sources (6 or more) to gather reliable information. <p>(4 marks)</p>	<ul style="list-style-type: none"> • Conducts a research investigation to answer scientific question on the application a magnetic fields in technology. • Uses a range of relevant secondary sources (at least 5) to gather reliable information. <p>(3 marks)</p>	<ul style="list-style-type: none"> • Conducts a basic level research investigation to answer scientific question on the application a magnetic fields in technology. • Uses some relevant secondary sources (at least 3) to gather reliable information. <p>(2 marks)</p>	<ul style="list-style-type: none"> • Conducts a limited research investigation to answer scientific question on the application a magnetic fields in technology. • Uses a limited amount of secondary sources (1 – 2 sources) to gather information. <p>(1 mark)</p>	

PH11 – 7 Communicates scientific understanding using suitable language and terminology for a specific audience or purpose	<ul style="list-style-type: none"> Outstanding use of suitable scientific language. Research presented is organised in a logical and concise manner. <p>(5 marks)</p>	<ul style="list-style-type: none"> High level use of scientific language. Research is presented in an organised manner. <p>(4 marks)</p>	<ul style="list-style-type: none"> Suitable use of scientific language. Research is presented clearly. <p>(3 marks)</p>	<ul style="list-style-type: none"> Some use of scientific language. Research is presented clearly. <p>(2 marks)</p>	<ul style="list-style-type: none"> Limited use of scientific language. Research presented is unorganised. <p>(1 mark)</p>	
---	--	---	--	--	--	--

Part 3 – Creating a model

Outcomes assessed:	Outstanding (A)	High (B)	Sound (C)	Basic (D)	Limited (E)	Marks:
PH11 – 2 Designs and evaluates investigations in order to obtain primary and secondary data and information	<ul style="list-style-type: none"> Selects highly appropriate materials to design and construct an appropriate model. Provides a thoroughly annotated diagram of the created model. <p>(5 marks)</p>	<ul style="list-style-type: none"> Selects highly appropriate materials to design and construct an appropriate model. Provides a clearly annotated diagram of the created model. <p>(4 marks)</p>	<ul style="list-style-type: none"> Selects appropriate materials to design and construct an appropriate model. Provides an annotated diagram of the created model. <p>(3 marks)</p>	<ul style="list-style-type: none"> Selects some appropriate materials to design and construct an appropriate model. Provides a labelled diagram of the created model. <p>(2 marks)</p>	<ul style="list-style-type: none"> Selects some materials to design and construct an appropriate model. Provides a poorly labelled diagram of model. <p>(1 mark)</p>	
PH11 – 6 Solves scientific problems using primary and secondary data, critical thinking skills and scientific processes	<ul style="list-style-type: none"> Creates and designs an outstanding model that clearly demonstrates how the chosen magnetic field performs its function. 	<ul style="list-style-type: none"> Creates and designs a high level model that clearly demonstrates how the chosen magnetic field performs its function. 	<ul style="list-style-type: none"> Creates and designs a model that demonstrates how the chosen magnetic field performs its function. <p>(3 marks)</p>	<ul style="list-style-type: none"> Creates and designs a simple model that demonstrates some understanding of how the chosen magnetic field performs its function. <p>(2 marks)</p>	<ul style="list-style-type: none"> A model of the chosen magnetic field is constructed with limited demonstration of how the chosen magnetic field performs its function. 	

	(5 marks)	(4 marks)			(1 marks)	
	<ul style="list-style-type: none"> • Critically evaluates the effectiveness of the model in demonstrating the function of the chosen magnetic field. • Clearly outlines the limitations of the model. <p style="text-align: center;">(5 marks)</p>	<ul style="list-style-type: none"> • Clearly evaluates the effectiveness of the model in demonstrating the function of the chosen magnetic field. • Clearly outlines most of the limitations of the model. <p style="text-align: center;">(4 marks)</p>	<ul style="list-style-type: none"> • Evaluates the effectiveness of the model in demonstrating the function of the chosen magnetic field. • Outlines some of the limitations of the model. <p style="text-align: center;">(3 marks)</p>	<ul style="list-style-type: none"> • Basic evaluation of the effectiveness of the model in demonstrating the function of the chosen magnetic field. • One limitations of the model identified <p style="text-align: center;">(2 marks)</p>	<ul style="list-style-type: none"> • Limited evaluation of effectiveness of the model in demonstrating the function of the chosen magnetic field. • No limitations of the model identified. <p style="text-align: center;">(1 marks)</p>	

__ / 40

Feedback:
