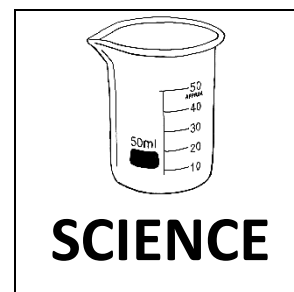




Depth Study



Subject:	HSC Chemistry
Year:	12
Task:	Depth Study
Due Date:	April 7 th 2020
Marks:	/80
Weighting:	25%
Assessment Mode:	Depth Study

Outcomes

CH11/12-1 develops and evaluates questions and hypotheses for scientific investigation

CH11/12-2 designs and evaluates investigations in order to obtain primary and secondary data and information

CH11/12-3 conducts investigations to collect valid and reliable primary and secondary data and information

CH11/12-4 selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media

CH11/12-5 analyses and evaluates primary and secondary data and information

CH11/12-6 solves scientific problems using primary and secondary data, critical thinking skills and scientific processes

CH11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose

CH12-13 describes, explains and quantitatively analyses acids and bases using contemporary models

Marking Criteria:

Students will be assessed on their ability to:

In this task you will undertake a 15 hour progressive depth study investigating the Titration of aspirin to compare laboratory results with 'stated' amounts for quality control purposes related to consumer chemistry. You will write a **FULL SCIENTIFIC REPORT INCLUDING AN ANNOTATED BIBLIOGRAPHY** being the assessable components of the depth study. The depth study will involve research questions, performing the acid-base titrations with the aspirin, titration calculations and the final write up. Research questions should be completed in class and at home and the bulk of the titration aspect will be completed **IN CLASS**. The **FINAL** submission date will be April 7th 2020.

Your teacher will help facilitate the depth study; however, it is up to you to complete various aspects on your own in order to be able to complete the written report.

- Guiding research questions will be given for background aspects of the depth study.
- A method for the titrations and some discussion questions will be provided by the teacher. However, it is up to you to ask questions and read instructions fully.
- The **WRITTEN REPORT** should be typed however relevant equations and calculations **MAY** be handwritten on the report and **SHOULD** be included.
- An annotated bibliography is to be handed in with the report.

Marking criteria is attached for referral throughout the depth study assessment. Please read it carefully to include all parts of the report.

Submission / Late Policy

Students are expected to submit their assessment tasks during the period the class meets on the due date. Students submitting assessment tasks at the staff room should only submit these tasks to their teacher or a nominated representative from the faculty. If the task is collected by anyone else the student MUST ask for a signed submission receipt.

Year 11-12 students will receive a zero for failing to submit their assessment task by the due date unless they have a doctor's certificate stating the nature of their absence. This is in line with NESA's ACE manual.

If you are absent on the due date you must submit the assessment task with a doctor's certificate on the first day that you return to school, whether you have the class or not. Failure to supply a doctor's certificate may result in a zero being awarded for the task.

HSC CHEMISTRY – INVESTIGATION 2 – DEPTH STUDY: INVESTIGATION THE TITRATION OF ASPIRIN FOR QUALITY CONTROL IN MEDICINAL CONSUMER CHEMISTRY.

	0	1	2	3	4	5	GRADE/ MARKS
Research/Forward CH11/12-4 CH11/12-5 CH11/12-6 CH11/12-7	Not attempted.	Elementary background research; provides only definitions or very simple statements on each of the concepts related to depth study.	Basic Background research. Attempt at linkage between titration and at ONE other concepts related to the depth study.	Sound background research on various concepts but lacking detail and linkage between ideas for the purpose of the depth study.	Thorough background research on various concepts including titrations and relating this to acid/base reactions in quantitative chemistry. Attempt at relating information to quality control and consumer chemistry.	Extensive background research linking concepts of titration with specific acid/base reactions, quality control in quantitative measurements and consumer chemistry/industry.	/5
Purpose CH11/12-1 CH11/12-6	Not attempted.	Writes a basic statement.	Writes a statement related to the investigation.	Writes a concise and correct statement related to the investigation and topic content.			/3
Hypothesis CH11/12-1 CH11/12-6	Not attempted	Writes a basic hypothesis.	Writes a hypothesis based on prior knowledge and information identifying prediction of outcome of investigation.	Writes a hypothesis in the correct format identifying variables AND prediction of outcome based on prior knowledge and understanding of content.			/3
Risk Assessment CH11/12-2 CH11/12-3 CH11/12-6	Not attempted.	Lists some hazards of the investigation.	Identifies some hazards and outline the risks these hazards present in the investigation.	Identifies some general strategies to minimise identified risks and potential hazards.	Carries out a full risk assessment of intended experimental procedure to address potential hazards identifying specific techniques to minimise them.		/4
Method CH11/12-2 CH11/12-3 CH11/12-6	Not attempted.	Writes a basic method with a logical sequence.	Writes a method including reliability only	Writes a method including reliability AND Identifies 1 controlled variable AND ONE of independent variable OR dependent variable.	Writes a method including reliability AND Identifies 1 controlled variable AND dependent AND independent variable.	Writes a method written in a logical sequence AND 3 rd person AND using full sentences INCLUDING reliability AND dependent AND independent variable AND	/5

						Identifies more than 1 controlled variable	
Method: Titration/standardisation. CH11/12-2 CH11/12-3 CH11/12-6 CH12-13	Not attempted	Identifies equipment required for a titration or making up a standard solution	Outlines correct technique for titration OR making a standard solution using correct equipment name.	Describes correct technique for a titration OR making a standard solution including rinsing procedures and equipment use.	Describes correct technique for a titration AND making a standard solution including rinsing procedures and equipment use.	Comprehensively describes technique for BOTH a titration and making a standard solution including rinsing procedures, equipment use AND calculations	/5
Results CH11/12-3 CH11/12-4 CH11/12-6	Not attempted.	Records results.	Records results in a table.	Records results in a table drawn with ruler.	Records results in a table drawn with a ruler. Some appropriate headings included.	Records results in correctly ruled and drawn table including ALL headings with appropriate units included.	/5
Calculations and equations: CH11/12-4 CH11/12-6 CH12-13	Not attempted.	A calculation attempted	Calculations attempted with correct formula/s used more than 2 mistakes detected AND some working shown.	Calculations completed using correct formula; 1-2 mistakes detected AND some working shown	Calculations completed using correct formula/s with no mistakes AND some working shown.	ALL calculations completed using correct formula/s AND ALL working shown.	/5
	Not attempted	One equation attempted	One titration equation completed but not balanced correctly	One titration equation completed AND fully balanced correctly.	Both titration equations completed but NOT fully/correctly balanced.	BOTH titration equations completed AND fully/correctly balanced.	/5
Discussion: Results analysis CH11/12-5 CH11/12-6 CH11/12-7 CH12-13	Not attempted.	Restates results (1 mark)	Outlines patterns/trends in results. (2 marks)	Describes results in terms of patterns and trends	Explains results patterns/trends in terms of theory concept	Analyses results patterns/trends based on theory content and performance of investigation	/10
	Not attempted.	States investigation could be repeated or improved.	Identifies one way in which investigation could be improved OR identifies how investigation could be changed.	Identifies how investigation could be improved AND changed.	Describes how investigation could be improved AND changed in further repetitions	Explains how changes could improve the overall investigation if repeated.	
Discussion: Reliability and validity CH11/12-5 CH11/12-6 CH11/12-7	Not attempted.	Identifies how reliability OR validity was achieved in the practical investigation	Identifies how reliability AND validity was achieved in practical investigation.	Describes how reliability AND validity was achieved in practical investigation.	Explains how reliability AND validity was achieved in practical investigation.	Evaluates reliability AND validity of investigation.	/5

<p>Discussion: Theory Content –titrations and consumer chemistry. CH11/12-5 CH11/12-6 CH11/12-7 CH12-13</p>	Not attempted.	<p>1-2 Identifies a relationship between quantitative analysis (titrations) and quality control of acids and bases.</p>	<p>2-4 Outlines the relationship between quantitative techniques such as titrations and quality control and attempts to relate to general consumer chemistry.</p>	<p>5-6 Describes the importance of quantitative techniques such as titrations for quality control and relates to general consumer chemistry.</p>	<p>7-8 Explains the importance of quantitative techniques such as titrations for quality control purposes with some reference to medicinal consumer chemistry and their own results.</p>	<p>9-10 Analyses the importance of quantitative techniques such as titrations for quality control purposes with specific reference to medicinal consumer chemistry and their own results.</p>	/10
<p>Conclusion CH11/12-5 CH11/12-7 CH12-13</p>	Not attempted.	Repeats or restated the results	Outlines the results relating to purpose.	Writes a general conclusion that addresses the investigation.	Writes an appropriate conclusion that addresses the purpose of the investigation	Analyses the first hand data from investigation to write a logical conclusion that addresses the purpose of the investigation	/5
<p>Annotated Bibliography CH11/12-4 CH11/12-5 CH11/12-7</p>	Not attempted	<p>1-2 <u>list</u> 2-3 resources but provided no annotations. OR provide a simple bibliography for 1 resources.</p>	<p>3-4 provide an annotated bibliography for 2-3 resources that <u>outlines</u> the reliability of the information gathered from each named source.</p>	<p>5-6 provide an annotated bibliography for 2-3 resources that <u>describes</u> the reliability of the information gathered from each named source.</p>	<p>7-8 provide an annotated bibliography for three different types of resources that <u>explains</u> the reliability of the information gathered of each identified source</p>	<p>9-10 provide a correctly annotated bibliography for more than three different types of resources and <u>evaluates</u> the reliability AND validity of the information gathered of each identified source.</p>	10
<u>TOTAL</u>	0	1-10 (E)	11-30 (D)	31-55 (C)	56-70 (B)	71-80 (A)	/80

Marking Scheme

Marking Criteria	Marks
Band 6 <ul style="list-style-type: none"> • demonstrates an extensive knowledge and understanding of scientific concepts, including complex and abstract ideas • communicates scientific understanding succinctly, logically, and consistently using correct and precise scientific terms and application of nomenclature in a variety of formats and wide range of contexts • designs and plans investigations to obtain accurate, reliable, valid and relevant primary and secondary data, evaluating risks, mitigating where applicable, and making modifications in response to new evidence • selects, processes, and interprets accurate, reliable, valid, and relevant qualitative and quantitative, primary or secondary data, and represents it using a range of scientific formats to derive trends, show patterns and relationships, explain phenomena, and make predictions • designs solutions to scientific problems, questions, or hypotheses using selected accurate, reliable, valid, and relevant primary and secondary data, and scientific evidence, by applying processes, modelling and formats • applies knowledge and information to unfamiliar situations to propose comprehensive solutions or explanations for scientific issues or scenarios 	71-80
Band 5 <ul style="list-style-type: none"> • demonstrates thorough knowledge and understanding of scientific concepts, including complex and abstract ideas • communicates scientific understanding, logically, and effectively using correct scientific terms and application of nomenclature in a variety of formats and wide range of contexts • designs and plans investigations to obtain accurate, reliable, valid and relevant primary and secondary data, evaluating risks, mitigating where applicable, and making some modifications in response to new evidence • selects, processes, and interprets accurate, reliable, valid, and relevant qualitative and quantitative, primary or secondary data, and represents it using a range of scientific formats to derive trends, show patterns and relationships • designs solutions to scientific problems, questions, or hypotheses using selected accurate, reliable, and valid primary and secondary data, and scientific evidence, by applying processes, and formats • applies knowledge and information to unfamiliar situations to propose explanations for scientific issues or scenarios 	56-70
Band 4 <ul style="list-style-type: none"> • demonstrates sound knowledge and understanding of scientific concepts • communicates scientific understanding effectively using scientific terms and application of nomenclature • designs and plans investigations to obtain primary and secondary data and evaluates risks • processes and interprets primary and secondary data, and represents it using a range of scientific formats • identifies scientific problems, questions, or hypotheses and applies processes, and formats to primary or secondary data • applies knowledge and information relevant to scientific issues or scenarios 	31-55
Band 3 <ul style="list-style-type: none"> • demonstrates basic knowledge and understanding of scientific concepts • communicates scientific understanding using basic scientific terms and application of nomenclature • implements scientific processes to obtain primary and secondary data and identifies risks • processes primary or secondary data, and represents it using scientific formats • responds to scientific problems, questions, or hypotheses • recalls scientific knowledge and information 	11-30
Band 2 <ul style="list-style-type: none"> • demonstrates limited knowledge and understanding of scientific concepts • communicates scientific understanding using limited scientific terms • partially outlines investigations to obtain data and information • provides simple descriptions of scientific phenomena • recalls basic scientific knowledge and information 	6-10
Band 1 <ul style="list-style-type: none"> • provides some relevant information 	1-5
Band 0	Non-attempt

Teacher Feedback

COURSE OUTCOMES	Level of Achievement					
	Excellent	High Level	Substantial	Satisfactory	Elementary	Still to be achieved
CH11/12-1 develops and evaluates questions and hypotheses for scientific investigation						
CH11/12-2 designs and evaluates investigations in order to obtain primary and secondary data and information trends in the physical, structural and chemical aspects of matter						
CH11/12-3 conducts investigations to collect valid and reliable primary and secondary data and information						
CH11/12-4 selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media						
CH11/12-5 analyses and evaluates primary and secondary data and information						
CH11/12-6 solves scientific problems using primary and secondary data, critical thinking skills and scientific processes						
CH11/12-7 communicates scientific understanding using suitable language and terminology for a specific audience or purpose						
CH12-13 describes, explains and quantitatively analyses acids and bases using contemporary models						
		MARK		/		

Comments:

Student Reflection

Answer the following questions after completing the task and submit with your work.

1. How did you know what had to be done to complete this task?

2. Looking at my work and using the levels of achievement I believe this work is
(Tick one only)

- Band 6 - Excellent
- Band 5 - High
- Band 4 - Substantial
- Band 3 - Satisfactory
- Band 2 – Elementary
- Band 1

Because:

1. I need to ask help with:

Signed: _____ Date: ___ / ___ / ____

Teacher Comments

Signed: _____ Date: ___ / ___ / ____

BIBLIOGRAPHY

Complete an annotated bibliography, discussing the validity and reliability of the sources, following the Harvard style of referencing for at least three different types of sources.

Example:

(1) Trevor, C.O., Lansford, B. and Black, J.W., 2004, 'Employee turnover and job performance: monitoring the influences of salary growth and promotion', *Journal of Armchair Psychology*, vol 113, no.1, pp. 56-64.

(2.) In this article Trevor et al. review the influences of pay and job opportunities in respect to job performance, turnover rates and employee motivation. (3) The article is useful to my research topic, as Trevor et al. suggest that there are numerous reasons for employee turnover and variances in employee motivation and performance. (4) The main limitation of the article is that the survey sample was restricted to mid-level management, (5) thus the authors indicate that further, more extensive, research needs to be undertaken to develop a more in-depth understanding of employee turnover and job performance. (6) This article will not form the basis of my research; however it will be useful supplementary information for my research on pay structures. (7) This article's reliability is high due to the fact that it is published in a respected journal and referred to in many other studies. (8) This resource is valid to my research as it related to the research topic

Key – (1) Citation (2) Introduction (3) Usefulness (to your research/ to a particular topic) (4) Limitations (5) Conclusions (6) Reflection (explain how this work illuminates your topic or how it will fit in with your research) (7) Reliability (8) Validity

**DO NOT WRITE ON
THIS SHEET.
THIS IS ONLY AN
EXAMPLE.**

