Year 11 Chemistry - Module 2 depth study

## Outcomes

Outcomes are from

You will be assessed on the following outcomes in your Depth Study:

* CH11/12-1 - Develops and evaluates questions and hypotheses for scientific investigation
* 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
* CH11-9 - Describes, applies and quantitatively analyses the mole concept and stoichiometric relationships

### Module 2 – Introduction to Quantitative Chemistry

Choose **one** of the following suggestions or another of your own choice

Inquiry Question 1: What happens in chemical reactions?

* How do the ratios of reactants affect the products of combustion?

Inquiry Question 2: How are measurements made in chemistry?

* How does the percentage mass of different types of copper ore differ?

Inquiry Question 3: How are chemicals in solutions measured?

* What is the optimum concentration of fertiliser that should be applied to a particular plant species?

Inquiry Question 4: How does the Ideal Gas Law relate to all other Gas Laws?

* How do the gas laws affect the medical administration of gaseous anaesthetics?

### Task

1. Develop **one** inquiry question to help you develop a deep understanding of the syllabus through your investigation(s). Some suggestions are provided.
2. Develop a hypothesis and method to collect and record your data in appropriate form(s).
3. Analyse your data to ensure reliability and validity of your conclusion.
4. Communicate your depth study in appropriate form(s) using suitable language and terminology for the purposes of scientific review.

### Feedback

You should submit each part above for feedback from the teacher. The marking rubric is included below.

**Time:**

**Due Date:**

**Weighting:**

Table 1 – Marking Rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Outcomes | Limited | Basic | Sound | High | Outstanding |
| CH11/12-1 - Develops and evaluates questions and hypotheses for scientific investigation | Attempts to develop a question and hypotheses of some relevance but has limited understanding of the limitations of science to investigate some concepts. | Attempts to develop inquiry questions by clearly identifying concepts relating to Module 2. | Develops inquiry questions and hypotheses by identifying concepts that can be investigated scientifically from Module 2. | Develops inquiry questions and evaluates their relevance and whether they can be investigated scientifically from Module 2.  Recognises that new evidence may require a modification of investigations. | Develops and evaluates inquiry questions and hypotheses by identifying concepts that can be investigated scientifically from Module 2.  Uses new evidence to modify investigations. |
| CH11/12-5 - Analyses and evaluates primary and secondary data and information | Identifies trend/s in data.  OR  Identifies that data has some limitations. | Analyses data to identify trends and/or relationships.  Identifies that data has some limitations. | Analyses data to identify trends and relationships.  Identifies sources of error, uncertainty and limitations in data.  Assesses the relevance, accuracy, validity and reliability of data. | Analyses data sets to identify causal and correlational relationships, patterns and trends.  Assesses data sources thoroughly and suggest improvements to data. | Thoroughly analyses a wide range of data sets and information.  Assesses data sources thoroughly and suggest methods to improve data that were not possible to achieve by the student. |
| CH11/12-6 - Solves scientific problems using primary and secondary data, critical thinking skills and scientific processes | Refers to evidence and attempts to explain or solve a problem | Solves problem using evidence | Solves scientific problems using evidence to support critical thinking. | Evaluates processes and claims, and solves problems critically, with reference to evidence to justify reasoning.  Identifies possible alternatives to explanations.  (If relevant) Uses models to explain phenomena and make predictions. | Evaluates processes and claims, and solves problems critically, with reference to evidence to justify reasoning.  Discusses possible alternatives to explanations.  (If relevant) Evaluates the use of models to explain phenomena and make predictions. |
| CH11/12-7 - Communicates scientific understanding using suitable language and terminology for a specific audience or purpose | Attempts to communicate scientific understanding in a mode. (such as digital, visual, written and oral forms) | Communicates scientific understanding by using different modes | Communicates scientific understanding using suitable language and terminology in a range of modes. | Communicates scientific understanding effectively and is able to construct evidence-based arguments and engage in peer feedback. | Communicates scientific understanding effectively and is able to construct evidence-based arguments and engage in peer feedback to evaluate an argument or conclusion. |
| CH11-9 - Describes, applies and quantitatively analyses the mole concept and stoichiometric relationships | Needs assistance to select a Depth Study to investigate that links to a knowledge and understanding outcome.  Demonstrates an elementary knowledge of content and understanding of course concepts, and applies some skills and processes with guidance. | Selects a suitable inquiry question to investigate throughout their Depth Study investigation.  Demonstrates a basic knowledge of content and understanding of course concepts, and applies skills and processes in some familiar contexts. | Clearly reflects on the link between their chosen Depth Study and Module 2 of the Chemistry course.  Selects a suitable inquiry question to investigate throughout their Depth Study investigation.  Demonstrates sound knowledge of content and understanding of course concepts, and applies skills and processes in a range of familiar contexts. | Justifies their Depth Study investigation by perceptively linking the Module 2 outcome to investigate throughout their Depth Study investigation.  Uses their Depth Study to extend their knowledge and understanding beyond the course requirements.  Demonstrates thorough knowledge of content and understanding of course concepts, and applies well-developed skills and processes in a variety of contexts. | Justifies their Depth Study investigation in a sophisticated and persuasive manner by demonstrating that they are highly engaged with Module 2.  Uses their Depth Study as an opportunity to extend their knowledge and understanding beyond the course requirements.  Demonstrates extensive knowledge of content and understanding of course concepts, and applies highly developed skills and processes in a wide variety of contexts. |