



# ORANGE HIGH SCHOOL

## ASSESSMENT TASK NOTIFICATION

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|-----------------------------|---|
| <b>Subject</b>              | Chemistry   |
| <b>Year</b>                 | 12 (Higher School Certificate)  |
| <b>Task</b>                 | Number 1 (Research Task and Class Test)   |
| <b>Weighting</b>            | 35%   |
| <b>Teacher</b>              | Mr Routh  |
| <b>Head Teacher</b>         | Ms Huggett  |
| <b>Date given</b>           | Friday the 6 <sup>th</sup> of December 2024 – Week 8 Term 4   |
| <b>Date and school week</b> | Thursday the 13 <sup>th</sup> of February 2025 – Week 3 Term 1 (Day/date may change due to updated 2025 timetable) – Students return to school Week 2, Thursday.<br>Part A: 4 x A4 printed sheets of research<br>Part B: In-class test, you can use Part A during the test<br>→ All must be submitted together at the conclusion of the test. |

### Assessment Outline

#### **PART A – Research**

- To complete this task, you are required to plan, perform and conduct a second-hand investigation into the chemistry involved in a selection of syllabus outcomes, supplied on the next sheet.
- Students will need to ensure that they analyse, interpret and explain the information that they have collected to an extensive level (4 x A4 printed sheets of research – size 11 minimum – not back to back)
- Students must supply a detailed bibliography (not in page limit)
- The report must be physically submitted at the conclusion of the in-class test and online via Google classroom.

#### **PART B – Class Test**

- Students will sit an in-class 50-minute test based on the syllabus points researched in Part A.
- Students will be tested on their knowledge and how they can apply their researched information in given HSC style examination questions.
- Students will use their Part A notes (4 x A4 printed sheets of research – size 11 minimum – not back to back) during the Part B section

#### **Non-completion of Task:**

If you know you are going to be away on the day that the task is due, you must make alternative arrangements with your classroom teacher. If you are away on the day of the examination, you must catch up with your classroom teacher on the first day you return to make alternate arrangements to catch up on this task.

**Failure to follow the above procedures may result in a zero award.**

### Outcomes Assessed

**CH12 – 5** Analyses and evaluates primary and secondary data and information

**CH12 – 6** Solves scientific problems using primary and secondary data, critical thinking skills and scientific processes

**CH12 – 12** Explains the characteristics of equilibrium systems, and the factors that affect these systems

## Task 1: Research Task and In-class Test

Your research will address the following syllabus content statements:

- 5.1.4 Investigate the relationship between collision theory and reaction rate in order to analyse chemical equilibrium reactions
- 5.2.1 Investigate the effects of temperature, concentration, volume and/or pressure on a system at equilibrium and explain how Le Chatelier's principle can be used to predict such effects for an industrial chemical process.
- 5.2.3 Examine how activation energy and heat of reaction affect the position of equilibrium
- 5.3.1 Deduce the equilibrium expression (in terms of  $K_{eq}$ ) for an industrial chemical process.
- 5.3.2 Perform calculations to find the value of  $K_{eq}$  and concentrations of substances within an equilibrium system, and use these values to make predictions on the direction in which a reaction may proceed
- 5.3.3 Qualitatively analyse the effect of temperature on the value of  $K_{eq}$ .
- 5.3.4 Conduct an investigation to determine  $K_{eq}$  of a chemical equilibrium system, namely the industrial chemical process. (This will be a second-hand investigation)

Examples of some industrial processes (support 5.3.4) could include:

- Haber Process.
- Solvay Process, specifically the carbonator reaction.
- Production of  $H_2SO_4$  specifically the reaction of  $SO_2$  to  $SO_3$



| Task section               | Extensive<br>(A)<br>5 marks   | Thorough<br>(B)<br>4 marks  | Sound<br>(C)<br>3 marks   | Basic<br>(D)<br>2 marks   | Elementary<br>(E)<br>1 mark   | Total:          |
|----------------------------|---|---|---|---|---|-----------------|
| 5.3.4<br>(Research)        | At an extensive level:<br>- Content has been addressed correctly<br>- Chemical equations correctly used<br>- Verb has been correctly addressed<br>- Minimum 1 page for outcome<br>- Information is clear, concise and logical in nature. Images may be included | At a through level:<br>- Content<br>- Chemical equations<br>- Verb<br>- 1 page for outcome<br>- Logical flow of information in the research | At a sound level:<br>- Content<br>- Chemical equations<br>- Verb<br>- 1 page for outcome<br>- Logical flow of information in the research | At a basic level:<br>- Content<br>- Chemical equations<br>- Verb<br>- 1 page for outcome<br>- Logical flow of information in the research | At an elementary level:<br>- Content<br>- Chemical equations<br>- Verb<br>- 1 page for outcome<br>- Logical flow of information | 5               |
| Bibliography<br>(Research) | At an extensive level:<br>- Reference list present and correct (10 or more sources used)<br>- Research does not exceed the 4-page limit<br>- Scientific articles are used to supplement the research  | At a through level:<br>- Reference list<br>- Page limit<br>- Supplementary scientific articles  | At a sound level:<br>- Reference list<br>- Page limit<br>- Supplementary scientific articles  | At a basic level:<br>- Reference list<br>- Page limit<br>- Supplementary scientific articles  | At an elementary level:<br>- Reference list<br>- Page limit<br>- Supplementary scientific articles                              | 5               |
| In-class test              | At an extensive level:<br>25 – 21 marks received  | At a through level:<br>20 – 17 marks received   | At a sound level:<br>16 – 9 marks received  | At a basic level:<br>8 – 4 marks received   | At an elementary level:<br>3 – 1 mark(s) received   | 25              |
|                            |   |   |   |   | <b>Total Marks:</b>   | <u>    </u> /65 |

| Outcomes   |   |                     |                                   |                    |                   |
|--|---|---------------------|-----------------------------------|--------------------|-------------------|
| <b>CH12 – 5</b><br>Points 1.4, 2.1, 2.3 & bibliography | <b>CH12 – 6</b><br>Points 3.1, 3.2, 3.3 & 3.4 |                     | <b>CH12 – 12</b><br>In-class test |                    |                   |
| /20  | /20   |                     | /25                               |                    |                   |
| <b>Total Grade</b>                                     | <b>A</b><br>65 – 56                           | <b>B</b><br>55 – 44 | <b>C</b><br>43 – 15               | <b>D</b><br>14 – 6 | <b>E</b><br>5 – 0 |

Teacher Feedback:

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The typical performance in this band:

**Band 6**

- demonstrates an extensive knowledge and understanding of scientific concepts in Chemistry, 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 in Chemistry

**Band 5**

- demonstrates thorough knowledge and understanding of scientific concepts in Chemistry, 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 in Chemistry

**Band 4**

- demonstrates sound knowledge and understanding of scientific concepts in Chemistry
- 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 in Chemistry

**Band 3**

- demonstrates basic knowledge and understanding of scientific concepts in Chemistry
- 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 in Chemistry

**Band 2**

- demonstrates limited knowledge and understanding of scientific concepts in Chemistry
- 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 in Chemistry.