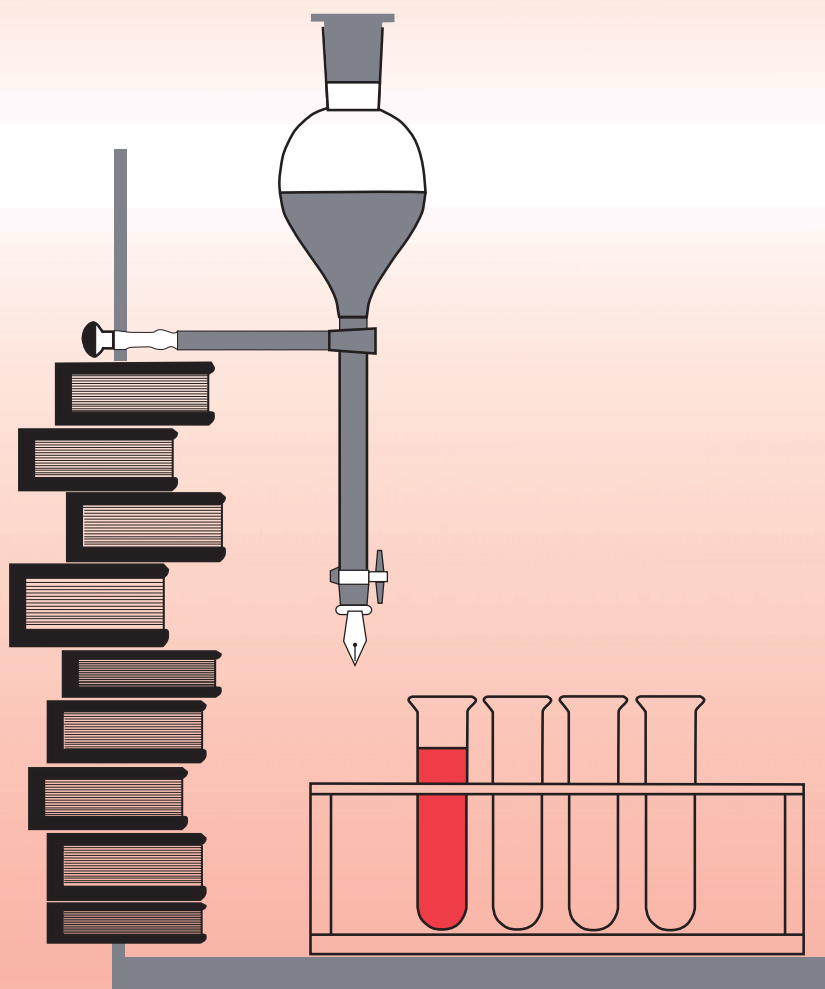


Writing with Chemistry Specific Genres Teaching Guide ①

Descriptive Report



True Light Middle
School of Hong Kong



Support Centre for Teachers
Using Chinese as the Medium of Instruction

Faculty of Education,
The University of Hong Kong

Science Education Section
Education Bureau

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Mr CHOW Son-i	(SKH Tsang Shiu Tim Secondary School)
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FOREWORD

What is Subject Specific Genre?

The organisation of a language is called "Genre". Every subject has its unique nature and content; the way of thinking as well as the form of expression is also different. These features are reflected on the style of language and therefore each of the subjects has a unique genre, which is called "Subject Specific Genre".¹

Different subject specific genres have different communicative functions which would in turn develop different features of genres. The process of using a genre to attain a specific communicative function is called genre structure. Having a good grasp of different genre structures can help students organise various writing materials more appropriately. Not only does every genre have its unique language structure, it also has its own language features. Language feature refers to the grammatical characteristics commonly found in that genre including the use of vocabulary, sentence patterns and others.¹

The relationship between genre, writing and learning

Language can help us construct knowledge and it plays an important role in learning and teaching. Students should have a sound language foundation so as to construct content knowledge efficiently and carry out critical thinking. Writing is the outcome of a series of procedures like knowledge input, processing and knowledge output. These procedures can help students clarify and consolidate the knowledge they acquired. Therefore, teaching students to use subject specific genre in writing chemistry essays can help them enhance their ability of expressing scientific concepts.¹

On the other hand, there are some suggested learning and teaching activities related to the NSS Chemistry and Combined Science (Chemistry Part) curricula; "reading and writing" is one of the examples. Chemistry teachers can take this opportunity to teach students to write with chemistry specific genre in order to improve students' ability of expressing chemistry knowledge. This can also arouse their interests in learning chemistry.

1 岑紹基、謝錫金、祁永華、鄺偉良、陳偉發、勞惠昌、陳曦圖、謝翰章 (2003)。《中學會考化學科專科語體資料冊》(第二版)。香港：香港大學教育學院母語教學教師支援中心。

The design and content of this book

In order to assist chemistry teachers to teach subject specific genres, and also help students express content knowledge with the use of subject specific genres and ultimately help them improve their writing skills in chemistry, the Science Education Section of Curriculum Development Institute has compiled *Writing with Chemistry Specific Genres-Teaching Guide* for teachers' reference and usage.

The teaching guide has a total of four booklets. Each booklet introduces one common type of chemistry specific genres:

Writing with Chemistry Specific Genres-Teaching Guide 1 – Descriptive Report
Writing with Chemistry Specific Genres-Teaching Guide 2 – Procedural Account
Writing with Chemistry Specific Genres-Teaching Guide 3 – Causal Explanation
Writing with Chemistry Specific Genres-Teaching Guide 4 – Comparison

The arrangement of contents for the above four booklets is similar. Each booklet has two chapters; they are "Instructional Design" and "Learning and Teaching Materials" for Chemistry Specific Genres. Chapter one "Instructional Design" provides two teaching schemes for the aforementioned genre. Each scheme consists of a series of teaching activities which is designed to help chemistry teachers teach chemistry specific genres in a systematic way. As for the worksheets and references adopted in the teaching schemes, they are all put in chapter two "Learning and Teaching Materials".

This book has already been uploaded onto the website "Writing with Chemistry Specific Genres" of the Education Bureau for teachers' reference.
(Website: <http://resources.edb.gov.hk/~science/genre/index-e.html>)

Chapter 1 Instructional Design for “Descriptive Report”

“Descriptive Report” is one of the commonly used chemistry specific genres. Its major function is to describe the attributes, properties, activities of things or the occurrence of phenomena. This genre helps students construct chemical knowledge, with the aid of concrete examples and diagrams, in a concise and direct way. This genre is also characterised by its frequent use of noun-based terminology.

1.1 Scheme 1

Level of Students: Secondary Four

Genre: Descriptive Report

Topic: NSS Chemistry Curriculum Topic II “Microscopic World I” and

NSS Combined Science (Chemistry Part) Curriculum Topic II “Microscopic World”

Implementation Period: Initial to intermediate phase of Secondary Four

Key Points	Teaching Activities	Learning and Teaching Materials	Estimated Time
<ul style="list-style-type: none">Teach students common vocabulary and sentence patterns of the writing topics, communicative function, genre structure and language features of “Descriptive Report”	(I) Brief Notes on “Descriptive Report” - Introduce the genre “Descriptive Report” - Use Question 4 of HKCEE 1999 Chemistry Paper I as a model essay to analyse the structure and features of “Descriptive Report”	Brief Notes on Descriptive Report (Section 2.1 of this booklet)	10 minutes
<ul style="list-style-type: none">Develop students’ ability of analysing questionsTeach students how to judge the most suitable genre for each questionLead students to make use of relevant chemical knowledge of “Microscopic World”	(II) Question Analysis - Finish Worksheet 1 - Discuss answers of Worksheet 1 <ul style="list-style-type: none">Review common vocabulary and sentence patterns of writing topics of “Descriptive Report”Discuss important notes of relevant chemical knowledge when answering questions	Worksheet 1: Question Analysis (Section 2.2 of this booklet)	20 minutes

1.1 Scheme 1

Key Points	Teaching Activities	Learning and Teaching Materials	Estimated Time
<ul style="list-style-type: none"> Teach students how to organise information by using Graphic Organiser With the aid of the paragraph formatting and vocabulary provided in the writing framework, help students recognise genre structure and vocabulary of "Descriptive Report" 	(III) Guided Writing <ul style="list-style-type: none"> Review chemical knowledge related to the question Finish Worksheet 2 in groups Group presentation Finish homework: Worksheet 3 	Worksheet 2: Guided Writing-Graphic Organiser (Section 2.3 of this booklet) Worksheet 3: Guided Writing-Writing Framework (Section 2.3 of this booklet)	30 minutes
<ul style="list-style-type: none"> Review the genre structure and language features of "Descriptive Report" with students Help students master the features of "Descriptive Report" and express chemical knowledge in a clear and logical manner through writing "Descriptive Report" 	(IV) Writing Assignments for "Descriptive Report" <ul style="list-style-type: none"> Review the genre structure and common vocabulary of "Descriptive Report" Apply the genre "Descriptive Report" to write an essay related to "Microscopic World" Distribute Assessment Rubric to students and lead a more in-depth discussion with students 	Brief Notes on Descriptive Report (Section 2.1 of this booklet) Suggested Writing Topics for NSS Chemistry Curriculum and NSS Combined Science (Chemistry Part) Curriculum-Descriptive Report (Section 2.4.2 of this booklet) Assessment Rubric for Writing Assignment (Section 2.5 of this booklet)	40 minutes

1.2 Scheme 2

Level of Students: Secondary Four

Genre: Descriptive Report

Topic: NSS Chemistry Curriculum Topic II "Microscopic World I" and

NSS Combined Science (Chemistry Part) Curriculum Topic II "Microscopic World"

Implementation Period: Initial to intermediate phase of Secondary Four

Key Points	Teaching Activities	Learning and Teaching Materials	Estimated Time
<ul style="list-style-type: none"> Teach students common vocabulary and sentence patterns of the writing topics, communicative function, genre structure and language features of "Descriptive Report" 	(I) Brief Notes on "Descriptive Report" - Introduce the genre "Descriptive Report" - Use Question 4 of HKCEE 1999 Chemistry Paper I as a model essay to analyse the structure and features of "Descriptive Report"	Brief Notes on Descriptive Report (Section 2.1 of this booklet)	10 minutes
<ul style="list-style-type: none"> Let students develop a deeper understanding about the genre structure "Descriptive Report" 	(II) "Online Interactive Exercise" - Students should finish "Online Interactive Exercise: HKCEE 2002 Chemistry Paper I Question 5" by themselves at home or in school's computer room.	Online Interactive Exercise (Website: http://resources.edb.gov.hk/~science/genre/index-e.html)	20 minutes

1.2 Scheme 2

Key Points	Teaching Activities	Learning and Teaching Materials	Estimated Time
<ul style="list-style-type: none"> Review the genre structure and language features of "Descriptive Report" with students Help students master the features of "Descriptive Report" and express chemical knowledge in a clear and logical manner through writing "Descriptive Report" 	(III) Writing Assignments for "Descriptive Report" <ul style="list-style-type: none"> Review the genre structure and common vocabulary of "Descriptive Report" Apply the genre "Descriptive Report" to write an essay related to "Microscopic World" Distribute Assessment Rubric to students and lead a more in-depth discussion with students 	Brief Notes on Descriptive Report (Section 2.1 of this booklet) Suggested Writing Topics for NSS Chemistry Curriculum and NSS Combined Science (Chemistry Part) Curriculum-Descriptive Report (Section 2.4.2 of this booklet) Assessment Rubric for Writing Assignment (Section 2.5 of this booklet)	40 minutes
<ul style="list-style-type: none"> Assess students' progress in applying "Descriptive Report" in writing chemistry essays 	(IV) Assessment <ul style="list-style-type: none"> Incorporate questions with effective communication into tests or examinations and the required genre for these questions is "Descriptive Report" Teachers may set questions on other topics 	Questions with Effective Communication in HKCEE Chemistry Paper I - Descriptive Report (Section 2.4.1 of this booklet) Suggested Writing Topics for NSS Chemistry Curriculum and NSS Combined Science (Chemistry Part) Curriculum-Descriptive Report (Section 2.4.2 of this booklet)	40 minutes

1.3 Teaching Tips



- It is proposed that teachers may teach students "Descriptive Report" during the beginning period of the learning and teaching process of NSS Chemistry Curriculum (that is the initial to intermediate phase of secondary four). This can help students master the skills of how to describe the attributes and properties of chemical substances.
- Both teaching schemes 1 and 2 are comprised of four teaching activities. Teachers may choose either one of the schemes according to their preference.
- Teachers may adjust the weighting of assessment criteria in accordance with students' aptitude and other factors.
- Students solely following the genre structure of "Descriptive Report" in writing essays can already attain specific communicative function for that genre. However, if students are more competent, teachers can advise students to pay more attention to the arrangement of paragraphs and transition. Teachers can also encourage them to summarise the main points or express their opinion in the closing paragraph in order to make the whole essay well-structured and more coherent.
- Teachers may incorporate questions with effective communication into tests or examinations in order to evaluate students' learning progress in applying "Descriptive Report" in chemistry writing.
- Teachers can directly use worksheets provided in this booklet to teach chemistry specific genres. They can also consult the design of worksheets and tailor-make teaching materials for students on other topics.



NOTE

Chapter 2 Learning and Teaching Materials for “Descriptive Report”

2.1 Brief Notes on Descriptive Report

Common vocabulary and sentence patterns of the writing topics

- Describe ...
- Give a description of ...
- State the principle ...
- What are the properties / functions of ...?

Communicative Function

- To describe the attributes, properties, activities of things or the occurrence of phenomena

Structure

Parts of the Structure	Contents and Functions
General statement	- to point out the things or phenomena to be described within a certain scope and provide an explicit basis for later descriptions
Descriptions	- describe the attributes, properties, activities of things or the occurrence of phenomena - use “an individual paragraph for one focus”; sub-heading can be placed at the beginning of each paragraph - use labelled illustrations, diagrams, figures, tables and examples to accompany and support the written text (optional)

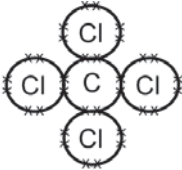
Language Features

Language Features	Examples
Repeated use of subject name to emphasise the topic	---
Use words expressing definition	is/are a ... of, refers to, can be seen as, called
Use words expressing characteristics or classification	consists of, is composed of, comprises, is classified as, is categorised as, belong to, are grouped into
Use words expressing adding information	furthermore, in addition, also, apart from this, as well as, what is more, not only...but also, which (surrounded by commas)
Use a lot of adjectives	---

Sample Text

HKCEE 1999 Chemistry Paper I Question 4:

With the help of electron diagrams, describe the formation of magnesium chloride and tetrachloromethane from atoms of relevant elements.

Structure	Suggested Answer	Language Features
General statement 1	<i>Magnesium chloride</i> <u>contains</u> two elements, magnesium and chlorine.	<p><i>Repeated use of subject name</i></p> <p>Use words expressing definition / characteristics or classification</p> <p>Use words expressing adding information</p>
Description A	Each magnesium atom donates its two outermost electrons to form a magnesium ion and each chlorine atom accept one electron to form a chloride ion. Then a stable ionic compound, <i>magnesium chloride</i> , will be formed.	
Description B	<u>In addition</u> , the electron diagram of <i>magnesium chloride</i> is shown below: $[\text{Mg}]^{2+} \quad \begin{array}{c} [\text{Cl}]^{-} \\ [\text{Cl}]^{-} \end{array}$	
General statement 2	<i>Tetrachloromethane</i> <u>contains</u> two elements, chlorine and carbon.	
Description A	Each carbon atom shares a pair of electrons with each of the four chlorine atoms to form a stable covalent compound, <i>tetrachloromethane</i> .	
Description B	<u>Moreover</u> , the electron diagram of <i>tetrachloromethane</i> is shown below: 	

2.2 Question Analysis

Worksheet 1

Read the following question carefully. Underline the keywords on the topic to determine the type of genres to be used, and put down the name of the genre in part (1). After that, find the relevant chemical knowledge from textbooks or other ways according to the prompt (a, b, c), and write down the important notes in part (2).

Question:

'When atoms combine^a, they tend to attain noble gas electronic structures^b.'
Discuss how atoms can attain the noble gas electronic structures. In your answer, you should give suitable examples and the electronic structures of the products formed^c.

(HKCEE 1995 Chemistry Paper I Question 4)

- (1) The writing genre required for the answer: _____
(Hint: descriptive report / procedural account / causal explanation / comparison)
- (2) Relevant chemical knowledge:
- a. _____
- b. _____
- c. _____

2.2 Question Analysis

Suggested Answer for Worksheet 1

Read the following question carefully. Underline the keywords on the topic to determine the type of genres to be used, and put down the name of the genre in part (1). After that, find the relevant chemical knowledge from textbooks or other ways according to the prompt (a, b, c), and write down the important notes in part (2).

Question:

'When atoms combine^a, they tend to attain noble gas electronic structures^b.'
Discuss how atoms can attain the noble gas electronic structures. In your answer, you should give suitable **examples** and the electronic structures of the products formed^c.

(HKCEE 1995 Chemistry Paper I Question 4)

(1) The writing genre required for the answer: descriptive report

(Hint: descriptive report / procedural account / causal explanation / comparison)

(2) Relevant chemical knowledge:

- a. The methods of combination of atoms / Types of bonding
- b. The stability and electron configuration of noble gas atom
- c. Draw the electron diagrams to represent electron structures of compounds

2.3 Guided Writing

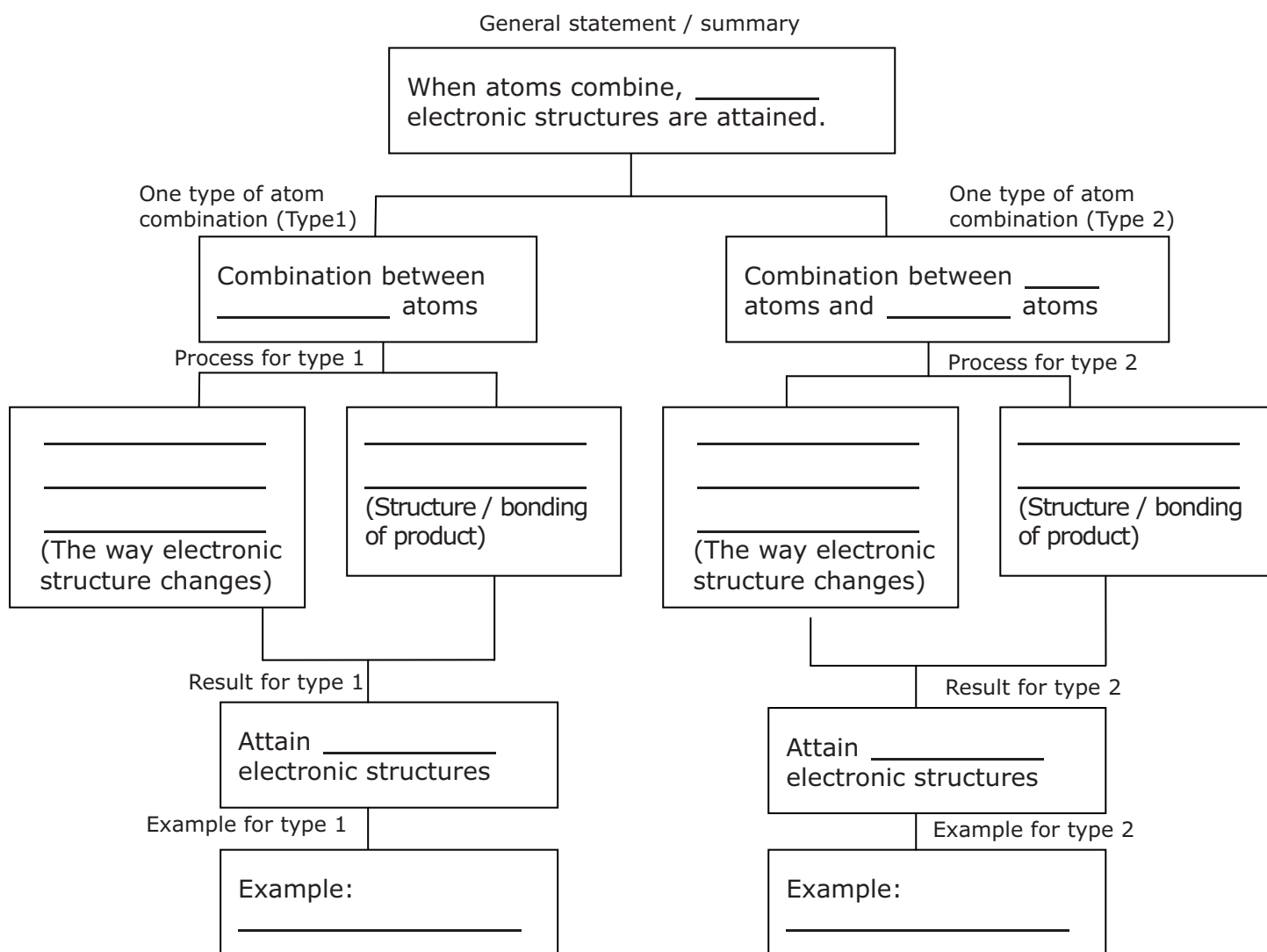
Worksheet 2

The writing genre required for the following question is "Descriptive Report". Write down the answers briefly and organise them into the **Graphic Organiser**.

Question:

'When atoms combine, they tend to attain noble gas electronic structures.'
Discuss how atoms can attain the noble gas electronic structures. In your answer, you should give suitable examples and the electronic structures of the products formed.

(HKCEE 1995 Chemistry Paper I Question 4)



2.3 Guided Writing

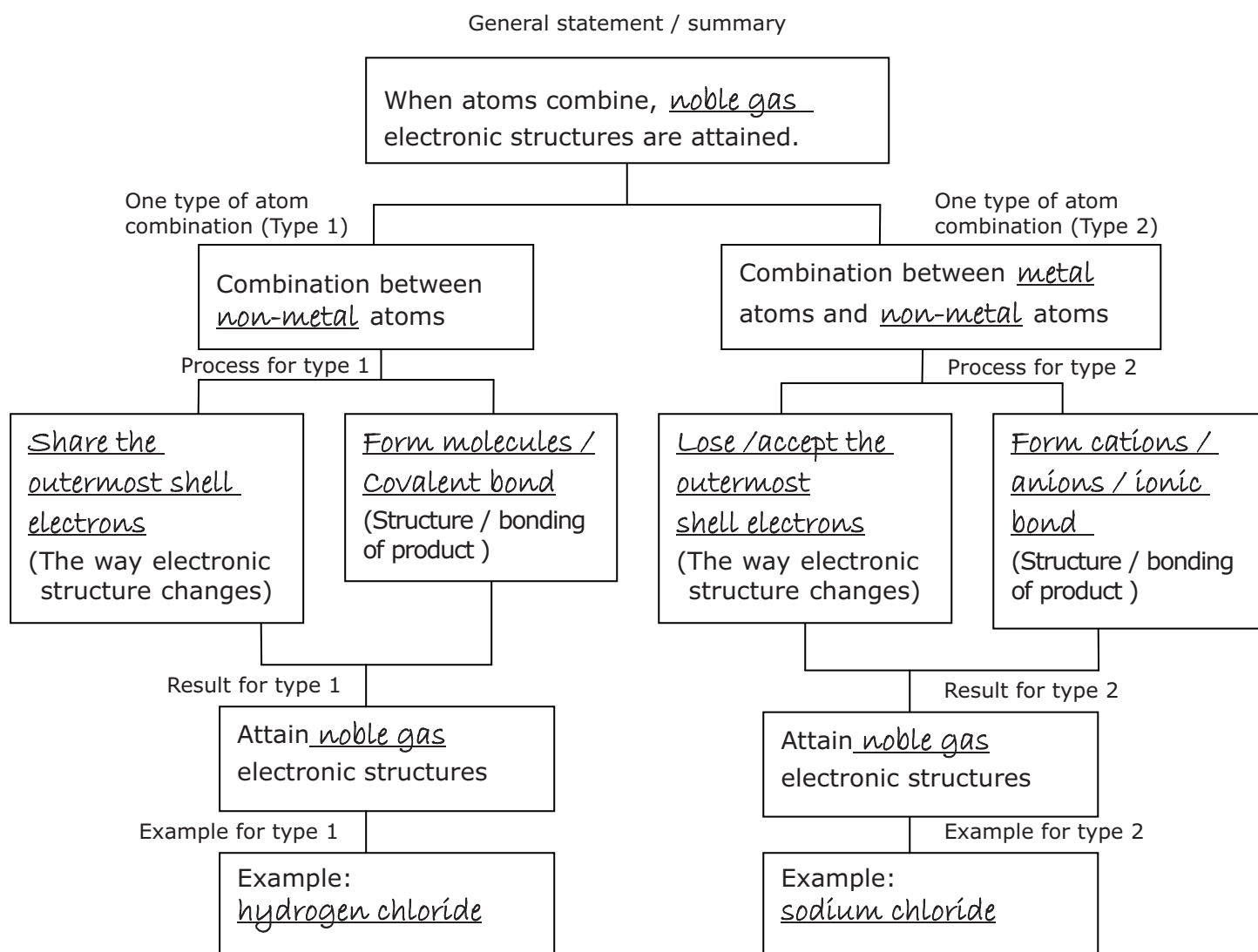
Suggested Answer for Worksheet 2

The writing genre required for the following question is "Descriptive Report". Write down the answers briefly and organise them into the **Graphic Organiser**.

Question:

'When atoms combine, they tend to attain noble gas electronic structures.'
Discuss how atoms can attain the noble gas electronic structures. In your answer, you should give suitable examples and the electronic structures of the products formed.

(HKCEE 1995 Chemistry Paper I Question 4)



2.3 Guided Writing

Worksheet 3

According to the information written in Worksheet 2, answer the question in the following **Writing Framework**. The framework indicates the paragraphs and the structure of the genre. The vocabulary suggested in the framework are the language features commonly used in "Descriptive Report". Yet, similar wordings can be used instead.

Question:

'When atoms combine, they tend to attain noble gas electronic structures.'
Discuss how atoms can attain the noble gas electronic structures. In your answer, you should give suitable examples and the electronic structures of the products formed.

(HKCEE 1995 Chemistry Paper I Question 4)

Paragraph	Structure	Answer
1	General statement	<ul style="list-style-type: none"> - Words expressing definition (example: is/are a ... of) - Words expressing characteristics or classification (examples: consists of, is classified as, belong to)
2	Description 1	<ul style="list-style-type: none"> - Repeated use of subject name - Words expressing adding information (examples: in addition, also, furthermore)
	Diagram 1	
3	Description 2	<ul style="list-style-type: none"> - Repeated use of subject name - Words expressing adding information (examples: in addition, also, furthermore)
	Diagram 2	

2.3 Guided Writing

Suggested Answer for Worksheet 3

According to the information written in Worksheet 2, answer the question in the following **Writing Framework**. The framework indicates the paragraphs and the structure of the genre. The vocabulary suggested in the framework are the language features commonly used in "Descriptive Report". Yet, similar wordings can be used instead.

Question:

'When atoms combine, they tend to attain noble gas electronic structures.'

Discuss how atoms can attain the noble gas electronic structures. In your answer, you should give suitable examples and the electronic structures of the products formed.

(HKCEE 1995 Chemistry Paper I Question 4)


Paragraph	Structure	Answer
1	General statement	<i>Atoms</i> can attain the <u>noble gas electronic structures</u> either by sharing their outermost shell electrons or by the formation of an ionic bond.
2	Description 1	When <u>atoms</u> of non-metal <u>combine</u> , they tend to share their valence/ outermost shell electrons to form molecules. Using hydrogen chloride as an example, the hydrogen <u>atom</u> and the chlorine <u>atom combine</u> by sharing their outermost shell electrons. The hydrogen atom attains the <u>electronic structure of the noble gas</u> , helium while the chlorine atom also attains the <u>electronic structure of the noble gas</u> , argon.
	Diagram 1	The electron diagram of hydrogen chloride is as follows: 
3	Description 2	<i>In addition</i> , when a metal and non-metal <u>combine</u> , <u>atoms</u> of the metal donate electrons (to atoms of the non-metal) to form cations (positive ions/metallic ions), while <u>atoms</u> of the non-metal accept electrons to form anions (negative ion/non-metallic ions). Using sodium chloride as an example, the sodium atom loses its outermost shell electron and forms a positive sodium ion, attaining the <u>electronic structure of noble gas</u> , neon, while the chlorine atom gains the electron released from the sodium to form a negative chloride ion, attaining the <u>electronic structure of the noble gas</u> , argon.

	Diagram 2	<p>The electron diagram of sodium chloride is as follows:</p> $[\text{Na}]^+ \left[\begin{array}{c} \times \times \\ \times \text{Cl} \times \\ \times \times \end{array} \right]^-$
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2.4 Suggested Topics of Writing Assignments

2.4.1 Questions with Effective Communication in HKCEE Chemistry Paper I – Descriptive Report

Writing Topic		Curriculum Topic
CE 95 Question 4	<p>'When atoms combine, they tend to attain noble gas electronic structures.'</p> <p>Discuss how atoms can attain the noble gas electronic structures. In your answer, you should give suitable examples and the electronic structures of the products formed.</p>	Ionic & Covalent Bonds
CE 99 Question 4	<p>With the help of electron diagrams, describe the formation of magnesium chloride and tetrachloromethane from atoms of relevant elements.</p>	Ionic & Covalent Bonds
CE 02 Question 5	<p>Using alkenes as an example, describe the characteristics of members of a homologous series.</p>	Alkanes & Alkenes
CE 03 Question 5	<p>Plastic wastes cause environmental problems in modern cities. Suggest possible ways of treating plastic wastes, and discuss their advantages and disadvantages.</p>	Plastics

Remark: All questions from the Hong Kong Certificate of Education Examination papers are reproduced by permission of the Hong Kong Examinations and Assessment Authority.

2.4.2 Suggested Writing Topics for NSS Chemistry Curriculum and NSS Combined Science (Chemistry Part) Curriculum – Descriptive Report

Writing Topic	NSS Chemistry	NSS Combined Science (Chemistry Part)
Describe the principles and processes involved in evaporation, distillation, crystallisation and filtration as examples of physical separation methods.	Topic I Planet Earth	Topic I Planet Earth
Write an essay on the applications of materials such as graphite and aluminium in relation to their structures.	Topic II Microscopic World I	Topic II Microscopic World
Describe the occurrence of metals and their uses in daily life.	Topic III Metals	Topic III Metals
Describe the nature of common acid-base indicators.	Topic IV Acids and Bases	Topic IV Acids and Bases

2.5 Assessment Rubric for Writing Assignment

Teachers write scores and feedback in the appropriate boxes.

(1) Content knowledge (10 marks)

Excellent (9-10 marks)	Good (6-8 marks)	Average (3-5 marks)	Need to improve (0-2 marks)

(2) Structure (6 marks)

Excellent (5-6 marks)	Good (3-4 marks)	Average (2 marks)	Need to improve (0-1 mark)

(3) Use of Language (4 marks)

Excellent (4 marks)	Good (3 marks)	Average (2 marks)	Need to improve (0-1 mark)

(4) Feedback

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**Total Score of
Writing Assignment :**

/20

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5. 香港大學教育學院母語教學教師支援中心網頁。
(<http://www.cmi.hku.hk/>)。



NOTE

