S3 Topic 8

Cause and Effect

Level: S.3

Subject: Science

Topic: Knowledge Structure – **Cause and Effect**

Introduction

This set of ELA materials is designed to help students learn how to use English to express 'cause and effect' which is an important pattern of knowledge* in science. The ELA materials are based on knowledge and understanding students have already learned using Chinese as the medium of instruction. As students are already familiar with the science content, they will find it easier to learn the sentence patterns for cause-effect relationships using English.

The ELA materials require about 80 minutes. The lesson starts with a vocabulary introduction. Groups of English words/phrases showing the cause-effect relation are presented to students through a gap-filling task. The second task checks students' understanding by asking them to identify in the given sentences words/phrases showing cause and effect relationships. The final task progresses to a more difficult level requiring students to write sentences to express cause-effect relationships. Optional items are also provided to cater for students with stronger English ability.

*****Patterns of knowledge are those patterns through which knowledge is organized. They include Description, Sequence, Cause and Effect, Definition, Classification, Hypothesis, Exemplification and Evaluation. For more information, please refer to the attachments, which are taken from the sources below:

1. Zimmerman, F. (1989). English for Science. N.J.: Prentice Hall Regents.
2. *Teaching Ideas for Content Subject Teachers in English-medium Schools*, by EDB, http://www.edb.gov.hk/index.aspx?nodeID=1918&langno=1

Acknowledgement

This set of materials was produced jointly by the teachers of Christ College and the ELA research team.

ELA Lesson Plan – Cause and Effect

Description: This set of ELA materials aims at teaching some English words, phrases and sentence patterns commonly used to express the cause-effect relation. The material is based on two science topics: food and digestion, and colour (Section 12.2, 12.5 and 15.3 of the CDC Science syllabus). The lesson starts with a warm-up exercise reviewing with students the science content that they have already learned. Then students are introduced to the vocabulary and sentence patterns describing cause-effect relation through a gap-filling exercise. The lesson then progresses to an identification task. Students are required to identify the cause-and-effect expressions in sentences. The final task requires students to write sentences to describe cause-and-effect relations. Further optional items are provided for students with higher English ability.

Content Objective: After completing the activity, students should be able to:

- understand the concept of cause and effect in familiar science content.

Language Objective: After completing the activity, students should be able to:

- understand and use the English terms and phrases related to discussing cause-and-effect relationship between some key concepts (e.g., *cause, caused by, result in, result from, a result of, produce, produced by*);
- understand and use appropriate English expressions for discussing the cause-and-effect relationship of the key ideas such as food and growth, wavelengths and light, e.g.,
  - *Children need more proteins because they grow rapidly.*
  - *Because children grow rapidly, they need more proteins.*
  - *Children grow rapidly so they need more protein.*
  - *Mixing all wavelengths of visible light causes white light.*
  - *White light is produced by mixing all wavelengths of visible light.*
  - *When all wavelengths of visible light are mixed, white light is produced.*
  - *While light is produced as all wavelengths of visible light are mixed.*
  - *When copper is heated to 1,083 ℃, it melts.*
  - *Changes occur in plants when they absorb energy from the sun.*
  - *The burning of wood results in ashes.*
  - *Colour can be produced by the refraction of light.*
  - *Tooth decay may be caused by improper tooth brushing habits.*
  - *When a tooth is put into acid, the enamel of the tooth dissolves.*
  - *The enamel of a tooth dissolves when the tooth is put into acid.*
  - *If a tooth is put into acid, the enamel of the tooth dissolves.*
  - *The enamel of a tooth dissolves if a tooth is put into acid.*
  - *Acid causes the enamel of a tooth to dissolve.*
  - *Acid dissolves the enamel of the tooth.*
  - *The dissolution of the enamel of the tooth can be caused by acid.*

Steps:

Warm-up Exercise (Task A) – individual work with peer support (10-15 mins)

1. Organise students into mixed ability groups. Encourage the more able students to help the weaker ones.
2. Brief students that the objective of this ELA lesson is to learn to express in English some science content they have already learned in previous lessons.
3. Ask students to complete the worksheet as follows: Items 1a and 2a in Chinese, and items 1b and 2b in English. Items 1b and 2b require students to answer in their own words. (See TN1)
4. Discuss the answers with the class. Use students' answers as examples to illustrate the proper use of English words/phrases.

Vocabulary and Sentence Patterns (Task B) – Individual work with peer support (45 mins)

5. Students work in groups as they complete Task A.
6. Distribute Task B. (See TN2)
7. Go through the vocabulary list by giving examples of everyday English (See TN3). Read aloud the vocabulary with students once/twice.
8. Ask students to complete Items 1 to 4.
9. Check answers by asking students to read aloud their answers in complete sentences.
10. From Items 5 to 9, ask students to identify the words/phrases showing 'cause-and-effect' in each given sentence. (See TN4)
11. Check answers by asking different groups to read aloud the 'cause-and-effect' phrases/sentences. Highlight the words in the sentences which indicate cause-and-effect (See TN5).
12. Go on to Items 10 and 11. Highlight the hints showing the 'cause-and-effect' phrases in the sentences. Ask students to complete the items.
13. Move on to Items 12 and 13. Explain the task and complete Item 12 with the class as an example if necessary. Remind students they can refer to previous tasks for other examples, and that there may be more than one answer.
14. Items 14 and 15 are optional and more difficult. If there are more able students, encourage them to try.
15. Check answers, and see if students have any problems in using the vocabulary when writing sentences.

Round up (10-15 mins**)**

16. Go back to Task A. Ask students to complete Items 1b and 2b (2^{nd} trial of translation).
17. Check answers.
18. Summarize what has been learned. Highlight again the sentence patterns expressing the cause-and-effect relation.

Teacher's Notes

TN1: The teacher is suggested to walk around and give support to students when necessary. The teacher should also note some of students' answers for demonstration later .

TN2: Remind students to refer to their textbooks for relevant information if necessary.

TN3: The teacher is suggested to give examples of everyday English where the vocabulary is used (eg. *We suffer when there is no clean water*; *Smoky cars cause air pollution.*).

TN4: The teacher may complete a couple of the items with students together as examples if students are weak in understanding the concept of cause and effect.

TN5: The teacher may highlight the words showing the cause-and-effect relations.

0809 中三生物科英語增潤課程
Cause and Effect

Name:_____ Class:____(____)

Task A: 熱身練習

1. a) 如我們缺乏 _____，我們便會患上軟骨病。

   b) Please write sentence 1a in English. (1st trial)

_____

   c) Please write sentence 1a in English. (2nd trial)

_____

2. a) 因為兒童生長快，所以需要較多_____ 。

   b) Please write sentence 2a in English. (1st trial)

_____

_____

   c) Please write sentence 2a in English. (2nd trial)

_____

_____

Form 3 Biology
English Enhancement Exercise
Cause and Effect

Name:_____ Class:_____(____)

Task B: Vocabulary and Sentence Patterns

Vocabulary

…cause(s)…	**…is/are caused by…**	**If…**	**…if…**
…result(s) in …	**…is/are produced by…**	**When…**	**…when…**
…result(s) from…	**…is/are a result of…**	**As…**	**…as…**
…produce(s)…			

1. Mixing all wavelengths of visible light (混合) { _____ / results in / produces } white light.

2. White light is a result of { is caused by / _____ } mixing all wavelengths of visible light.

3. { If / _____ / As } all wavelengths of visible light are mixed, white light is produced.

4. White light is produced { if / when / _____ } all wavelengths of visible light are mixed.

In each of the following sentences, underline the <u>cause</u> with a single line and the <u>effect</u> with a double line.

5. When copper is heated to 1,083 ℃, it melts.

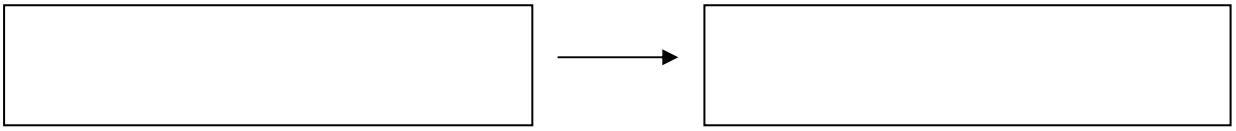
6. Changes occur in plants when they absorb energy from the sun.

7. The burning of wood results in ashes.

8. Colour can be produced by the reflection of light.

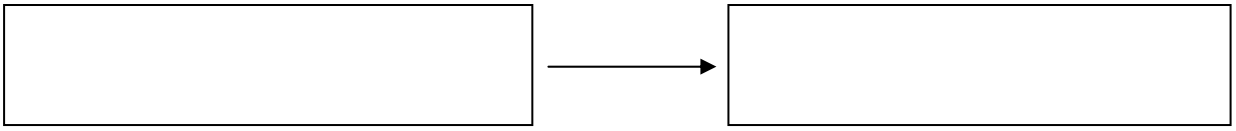
Read the following sentences. Put the cause in the first box and the effect in the second box.

9. The pH value inside the stomach is very low because gastric juice contains hydrochloric acid (HCl).

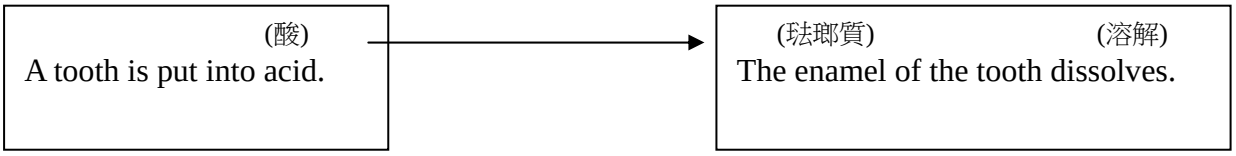


(蛀牙) (不適當的)

10. Tooth decay may be caused by improper tooth brushing habits.



Use the words provided to connect the two sentences in the boxes.



11. when

_____

12. if

_____

13. cause(s)…to…* (Challenging item - optional)

_____

14. Write in your own words* (Challenging item - optional)

_____

0809 中三生物科英語增潤課程 (Teacher's version)

Cause and Effect

Name:_____ Class:____(____)

Task A Key: 熱身練習

1. a) 如我們缺乏 _____，我們便會患上軟骨病 (rickets)。

   b) Please translate sentence 1a into English. (1st trial)

_____

   c) Please translate sentence 1a into English. (2nd trial)

If we do not have enough calcium / vitamin D, we will have /suffer from rickets.

2. a) 因為兒童生長快，所以需要較多_____ (proteins)。

   b) Please translate sentence 2a into English. (1st trial)

_____

_____

   c) Please translate sentence 2a into English. (2nd trial)

Children need more proteins because they grow rapidly.

Because children grow rapidly, they need more proteins.

Children grow rapidly so they need more protein.

Form 3 Biology
English Enhancement Exercise (Teacher's version)
Cause and Effect

Name:_____ Class:_____(____)

Task B Key: Vocabulary and Sentence Patterns

Vocabulary

…cause(s)…	**…is/are caused by…**	**If…**	**…if…**
…result(s) in …	**…is/are produced by…**	**When…**	**…when…**
…result(s) from…	**…is/are a result of…**	**As…**	**…as…**
…produce(s)…			

1. Mixing all wavelengths of visible light (混合) { causes / results in / produces } white light.

2. White light { is caused by / is a result of / is produced by } mixing all wavelengths of visible light.

3. { If / When / As } all wavelengths of visible light are mixed, white light is produced.

4. White light is produced { if / when / as } all wavelengths of visible light are mixed.

In each of the following sentences, underline the cause once and the effect twice.

5. When copper is heated to 1,083 ℃, it melts.

6. Changes occur in plants when they absorb energy from the sun.

7. The burning of wood results in ashes.

8. Colour can be produced by the reflection of light.

Read the following sentences. Put the cause in the first box and the effect in the second box.

9. The pH value inside the stomach is very low because gastric juice contains hydrochloric acid (HCl)

Gastric juice contains hydrochloric acid (HCl).	→	The pH value inside the stomach is very low.

(蛀牙) (不適當的)

10. Tooth decay may be caused by improper tooth brushing habits.

Improper tooth brushing habits	→	Tooth decay

Use the words provided to connect the two sentences in the boxes.

(酸) A tooth is put into acid.	→	(琺瑯質) (溶解) The enamel of the tooth dissolves.

11. when

When a tooth is put into acid, the enamel of the tooth dissolves.

The enamel of a tooth dissolves when the tooth is put into acid.

12. if

If a tooth is put into acid, the enamel of the tooth dissolves.

The enamel of a tooth dissolves if a tooth is put into acid.

13. cause(s)…to…* (optional item for students with stronger English ability)

Acid causes the enamel of a tooth to dissolve.

14. Write in your own words* (optional item for students with stronger English ability)

Acid dissolves the enamel of the tooth.

The dissolution of the enamel of the tooth can be caused by acid.