

Everyday Uses of Neutralization

Level: S2

Topic: Everyday Uses of Neutralization (Section 10.6 of Unit 10)

Introduction:

This set of ELA materials covers part of Section 10.6 of the CDC Science syllabus; the purpose is to help students learn through reading. In the previous CMI lessons on this topic, students have carried out an experiment to neutralize an alkali with a dilute acid, and evaporate the solution to obtain the salt from it. The terms related to neutralization have been introduced using both Chinese and English. In this ELA lesson, with the aid of PowerPoint slides, the teacher first reviews some of the key English terms in a given passage. Then students are asked to read a passage about two examples of daily uses of neutralization and to answer the questions that follow. After that the teacher goes back to their textbook for the other examples of daily uses of neutralization; at this stage, Chinese can be used as the medium of instruction.

This ELA lasts for a single period.

ELA Lesson Plan –Everyday Uses of Neutralization

Content Objectives:	After completing the activity, students should be able to: <ul style="list-style-type: none">• explain what happens when an acid is mixed with an alkali; and• explain some everyday uses of neutralization.
Language Objectives:	After completing the activity, students should be able to: <ul style="list-style-type: none">• understand and use the English terms related to this topic (e.g., <i>neutralization, neutralize, chemical reaction, occurs, acid, mixed with, alkali, neutral solution, obtained, pH value, solution, increase, decrease, bacteria, sugar, toothpaste, prevent, tooth decay, excess,</i>• Write answers, in complete sentences, demonstrating their understanding after reading a passage about everyday uses of neutralization, e.g.,<ul style="list-style-type: none">- <i>Neutralization is a chemical reaction that occurs when an acid is mixed with an alkali until a neutral solution is obtained.</i>- <i>When some alkali is added to a solution of an acid, the pH value of the solution will increase.</i>- <i>When some acid is added to a solution of an alkali, the pH value of the solution will decrease.</i>- <i>Bacteria in our mouth change the sugar left on our teeth into acids.</i>- <i>Alkaline toothpaste can neutralize the acids produced by the bacteria in our mouth.</i>- <i>Antacids contain weak alkalis, which can neutralize the excess acid in our stomach.</i>- <i>Strong alkalis will damage our stomach if too much of them are taken.</i>- <i>Strong alkalis can easily upset the pH balance of our stomach.</i>
Activities:	<ol style="list-style-type: none">1. Revision – whole-class activity (10 min)2. Reading comprehension and worksheet completion – individual and pair work (20 min)3. 中和作用的其他日常應用 – 全班活動 (10 min)
Materials:	Slides for revising the English terms, Worksheet

Steps:

Revision – whole-class activity (10 min)

1. The teacher should tell the class that they are going to read a passage about everyday uses of neutralisation, in English. The teacher should then revise the key English terms related to neutralization which are found in the reading passage.
2. The teacher should use the PowerPoint slides to revise the key terms with the class. It would be better if toothpaste and antacids had been included in the previous experiment to find the pH values of some household substances. Then in the revision, the teacher could review with students whether toothpaste and antacids are acidic or alkaline.
3. During the revision, the teacher should ask students to guess what substance in our mouth can be neutralized by toothpaste and what substance in our stomach can be neutralized by antacids. The teacher should not provide feedback on student responses at that moment, but should inform students that they will get the answers by reading the passage.

Reading comprehension and worksheet completion –individual and pair work (20 min)

4. The teacher should distribute the worksheet and tell the class to read the passage carefully and answer the questions using information from the passage. The teacher can remind students that they have already learned all the important terms in the passage.
5. As Question 7 in the worksheet asks for information beyond the passage, the teacher should allow students to discuss the answer with their neighbours. The teacher should also ask students to crosscheck each other's answer for Question 7 to make sure there are no grammatical mistakes.
6. Finally, the teacher should check the answers and explain any difficult words in the descriptions.

中和作用的其他日常應用 – 全班活動 (10 min)

7. 老師指出我們可以在日常生活中找到很多中和作用的例子。老師簡單解釋課本中列出中和作用在日常生活中的其他例子。

Two Everyday Uses of Neutralization 中和作用的兩個日常應用

Read the following passage and answer the questions using the information provided in the passage.

Neutralisation is an important chemical reaction. It occurs when an acid is mixed with an alkali until a neutral solution is obtained. We say that the acid and the alkali neutralise each other. Neutralisation is used in many ways in our daily lives. Brushing our teeth and taking antacids when we have *stomach ache* are two examples that involve neutralisation.

Our mouths contain bacteria (細菌). These bacteria can change the sugar left on our teeth into acids. These acids then dissolve our teeth and cause *tooth decay* (蛀牙). However, if we brush our teeth with toothpaste, the alkaline in the toothpaste will neutralise the acids produced by the bacteria in our mouth. Tooth decay can be prevented.

Our stomachs produce hydrochloric acid. This helps to break down the food in our stomach and kill bacteria. Sometimes our stomachs may produce too much acid. This happens when we are under stress (壓力) or have meals irregularly (不規則地). We may have a burning feeling in our stomachs. This stomach ache can be relieved (減輕) by taking some antacids. Antacids contain weak alkalis, which can neutralise the excess acid in our stomachs.

Answer the following questions in **complete sentences**.

1. Complete the following sentence about neutralization.

Neutralization is a chemical reaction that occurs when_____

2. When some alkali is added to a solution of an acid, will the pH value of the solution increase or decrease?

3. When some acid is added to a solution of an alkali, will the pH value of the solution increase or decrease?

4. Why will there be some acids on our teeth after a meal?

5. Why can brushing our teeth with toothpaste prevent tooth decay?

6. Why do people take antacids when they have stomach ache?

7. Antacids contain weak alkalis. Why do we use weak alkalis and not strong alkalis to neutralize the excess acid in our stomachs?

Two Everyday Uses of Neutralization 中和作用的兩個日常應用

Answers

Read the following passage and answer the questions using the information provided by the passage.

Neutralisation is an important chemical reaction. It occurs when an acid is mixed with an alkali until a neutral solution is obtained. We say that the acid and the alkali neutralise each other. Neutralisation is used in many ways in our daily lives. Brushing our teeth and taking antacids when we have *stomach ache* are two examples that involve neutralisation.

Our mouth contains bacteria (細菌). These bacteria can change the sugar left on our teeth into acids. These acids then dissolve our teeth and cause *tooth decay* (蛀牙). However, if we brush our teeth with toothpaste, the alkaline in the toothpaste will neutralise the acids produced by the bacteria in our mouth. Tooth decay can be prevented.

Our stomachs produce hydrochloric acid. This helps to break down the food in our stomachs and kill bacteria. Sometimes our stomachs may produce too much acid. This happens when we are under stress (壓力) or have meals irregularly (不規則地). We may have a burning feeling in our stomach. This stomach ache can be relieved (減輕) by taking some antacids. Antacids contain weak alkalis, which can neutralise the excess acid in our stomach.

Answer the following questions in **complete sentences**.

1. Complete the following sentence about neutralization.

Neutralization is a chemical reaction that occurs when *an acid is mixed with an alkali until a neutral solution is obtained.*

2. When some alkali is added to a solution of an acid, will the pH value of the solution increase or decrease?

The pH value of the solution will increase.

3. When some acid is added to a solution of an alkali, will the pH value of the solution increase or decrease?

The pH value of the solution will decrease.

4. Why will there be some acids on our teeth after a meal?

Bacteria in our mouth change the sugar left on our teeth into acids.

5. Why can brushing our teeth with toothpaste prevent tooth decay?

The alkaline toothpaste will neutralize the acids produced by the bacteria in our mouth.

6. Why do people take antacids when they have stomach ache?

Antacids contain weak alkalis, which can neutralize the excess acid in our stomach.

7. Antacids contain weak alkalis. Why do we use weak alkalis and not strong alkalis to neutralize the excess acid in our stomachs?

Strong alkalis will damage our stomach if too much of them is taken.

OR Strong alkalis can easily upset the pH balance of our stomach.

OR any reasonable answer





Slides for revising some key terms in the Passage 'Two Daily Uses of Neutralization'

Daily Uses of Neutralisation
中和作用的日常應用

ELA Research Team, OUHK
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Neutralisation

Acid + Alkali → Salt + Water

For example:

Hydrochloric acid + Sodium hydroxide → Sodium chloride + Water

氫氯酸 氫氧化鈉 氯化鈉

Neutralisation

- A chemical reaction 化學反應
- The acid and the alkali *neutralise* each other
- A *neutral* solution (salt + water) is produced

Two Daily Uses of Neutralisation

1. Brushing teeth




2. Taking antacids



Brushing teeth


- Is toothpaste acidic or alkaline?



- What is it used to neutralise in the mouth?

Taking antacids

- Are antacids acidic or alkaline?



- Which part of the body do antacids have effect?
- What are antacids used to neutralise in the stomach?

Vocabulary

Neutralisation (n.) 中和作用

Neutralise (v.) 中和

Neutral (adj.) 中性

Chemical reaction 化學作用

Acid 酸

Hydrochloric acid 氫氯酸

Alkali 鹼

Toothpaste 牙膏

Antacids 制酸劑

Stomach 胃