

How Polluted Is Our Air?

Level: S2

Topic: Air pollution (Section 7.7 of Unit 7)

Introduction:

This set of ELA material is an enrichment activity related to Section 7.7 of the CDC Science syllabus; it is designed to help students develop skills to learn through reading. Students have learned the causes of air pollution and the main air pollutants and their effects using Chinese as the medium of instruction. During these CMI lessons, English terms would have been introduced along with the Chinese terms. In this lesson, the teacher first reviews the related English terms which students will find in the reading passage. Then students will be asked to read the passage on air pollution in Hong Kong and answer questions related to it.

This ELA lasts for a single period.

ELA Lesson Plan – How Polluted is Our Air?

Content Objectives:	After completing the activity, students should be able to: <ul style="list-style-type: none">• state the main sources of air pollution in Hong Kong;• name most serious air pollutants found in Hong Kong;• explain why diesel oil is considered as a less clean type of fuel for vehicles;• list ways of reducing air pollution caused by vehicles.
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>air pollution, air pollutants, carbon monoxide, sulphur dioxide, nitrogen dioxide, suspended particulates, air-quality monitoring stations, diesel vehicles, LPG vehicles, power stations</i>);• draw on what they have learned about air pollution to understand an unseen passage entitled <i>How polluted is our air</i>, and then• answer a set of questions related to the passage using the key ideas from the text, e.g.,

- *When compared with other major cities in Asia, air pollution in Hong Kong is very similar to these cities.*
- *In Hong Kong, suspended particulates are the air pollutants that are at a very high level.*
- *When compared with the world standard, Hong Kong has a very high level of suspended particulates, which is a major type of air pollutant in Hong Kong.*
- *Vehicles are the main source of air pollution in Hong Kong*
- *A taxi using diesel oil produces more suspended particulates than a taxi using LPG.*
- *The air quality is worst at busy roadsides in Hong Kong.*
- suggest some ways to reduce the air pollution caused by vehicles, e.g.,
 - *Use cleaner fuels, such as unleaded petrol or LPG, for driving.*
 - *Use public transport.*
 - *Switch off the car engine while waiting.*
 - *Keep the vehicle engine in good condition.*

- Activities:
1. Revision – whole-class activity (15 min)
 2. Reading comprehension and worksheet completion – individual and pair work (25 min)

Materials: Slides for revising the English terms, Worksheet

Steps:

Revision – whole-class activity (15 min)

1. The teacher should first tell the class that they are going to read a passage, which is in English, about air pollution in Hong Kong, and that they will revise the English terms about air pollution before reading the passage.
2. The teacher should then use the PowerPoint slides to revise the key terms which will appear in the passage with the class.
3. During the revision, the teacher should ask students to guess what the air pollution situation is like in a few major cities in other parts of Asia. The teacher should also ask students why LPG is considered a cleaner fuel than diesel oil. Students should be told that they can find the answers to these questions in the reading passage.

Reading comprehension and worksheet completion – individual and pair work (25 min)

4. The teacher should distribute the worksheet and tell the class to find the answers to the questions after reading through the passage.
5. For Question 6 of the worksheet, the teacher should encourage students to discuss with their neighbours in order to generate more ideas about ways of reducing air pollution caused by vehicles. The teacher should also ask students to crosscheck each other's answers for Question 6 to make sure there are no grammatical mistakes.
6. The teacher should then check the answers and explain any difficult words in the descriptions. He/she may ask some students to write the answer to Question 6 on the blackboard and have the class point out any mistakes in terms of grammar and content.
7. The teacher should end the lesson by encouraging students who cannot answer all the questions to read through the passage again at home.

How polluted is our air? 我們的空氣有多污染?

Read the following passage and answer the questions that follow.

If we compare the air pollution of major cities in the world, Hong Kong's overall air pollution would be somewhere near the middle of the scale.

As there are regulations controlling the release of smoke from power stations and vehicles, the amount of air pollutants, for example lead, carbon monoxide and sulphur dioxide, is not at all high by world standards. However, we do have very high levels of very small dust particles (suspended particulates) in our air; this situation is very similar to that in Tokyo, Seoul and Kuala Lumpur.

Pollutants released from vehicles are still the major reason for air pollution in Hong Kong, especially in our city centre. For years, most of our monitoring stations have recorded a much higher level of fine dust particles than the air quality standards recommend as safe. The situation is worst at busy roadsides in the urban areas. The main reason is because a lot of vehicles in Hong Kong still use diesel oil. The burning of diesel oil releases a lot more fine dust particles and nitrogen dioxide than other fuels, making air pollution more serious.

As responsible citizens, what can we do to reduce the air pollution caused by vehicles?

(Adapted from: "Air Pollution and You – How polluted is our air?"

http://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/polyou_02.html

Multiple choice questions

- How serious is air pollution in Hong Kong when compared with other major cities in Asia?
 - Air pollution in Hong Kong is much more serious.
 - Air pollution in Hong Kong is less serious.
 - Air pollution in Hong Kong is very similar to these cities.
- In Hong Kong, which of the following types of air pollutants are at a very high level when compared with the world standard?
 - Lead
 - Suspended particulates
 - Sulphur dioxide

3. Which of the following is the main source of air pollution in Hong Kong?
- A. Power stations
 - B. Factories
 - C. Vehicles
-
4. Why is it that a taxi using diesel oil causes higher levels of air pollution than a taxi using LPG?
- A. A taxi using diesel oil produces more suspended particulates than a taxi using LPG.
 - B. A taxi using diesel oil produces more carbon dioxide than a taxi using LPG.
 - C. A taxi using diesel oil runs slower than a taxi using LPG.
-
5. The air quality is worst _____ in Hong Kong.
- A. at busy roadsides
 - B. inside busy shopping centres
 - C. on crowded beaches
-

Short question

6. Suggest TWO ways to reduce air pollution caused by vehicles. (You should write in complete sentences.)

1. _____

2. _____

How polluted is our air? 我們的空氣受污染程度如何?

Answers

Read the following passage and answer the questions that follow.

If we compare the air pollution of major cities in the world, Hong Kong's overall air pollution would be somewhere near the middle of the scale.

As there are regulations controlling the release of smoke from power stations and vehicles, the amount of air pollutants, for example lead, carbon monoxide and sulphur dioxide, is not at all high by world standards. However, we do have very high levels of very small dust particles (suspended particulates) in our air; this situation is very similar to that in Tokyo, Seoul and Kuala Lumpur.

Pollutants released from vehicles are still the major reason for air pollution in Hong Kong, especially in our city centre. For years, most of our monitoring stations have recorded a much higher level of fine dust particles than the air quality standards recommend as safe. The situation is worst at busy roadsides in the urban areas. The main reason is because a lot of vehicles in Hong Kong still use diesel oil. The burning of diesel oil releases a lot more fine dust particles and nitrogen dioxide than other fuels, making air pollution more serious.

As responsible citizens, what can we do to reduce the air pollution caused by vehicles?

(Adapted from: "Air Pollution and You – How polluted is our air?")

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Multiple choice questions

- How serious is air pollution in Hong Kong when compared with other major cities in Asia?
 - Air pollution in Hong Kong is much more serious.
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 - Air pollution in Hong Kong is very similar to these cities.
- In Hong Kong, which of the following types of air pollutants are at a very high level when compared with the world standard?
 - Lead
 - Suspended particulates
 - Sulphur dioxide

C

B

3. Which of the following is the main source of air pollution in Hong Kong?
- A. power stations
 - B. factories
 - C. vehicles
- C
4. Why is it that a taxi using diesel oil causes higher levels of air pollution than a taxi using LPG?
- A. A taxi using diesel oil produces more suspended particulates than a taxi using LPG.
 - B. A taxi using diesel oil produces more carbon monoxide than a taxi using LPG.
 - C. A taxi using diesel oil runs slower than a taxi using LPG.
- A
5. The air quality is worst _____ in Hong Kong.
- A. at busy roadsides
 - B. inside busy shopping centres
 - C. on crowded beaches
- A

Short question

6. Suggest TWO ways of reducing the air pollution caused by vehicles.
1. Use cleaner fuels, such as unleaded petrol or LPG, for driving.
 2. Use public transport.
- or* Switch off the car engine while waiting.
- or* Maintain the vehicle engines in good conditions.
- (Any reasonable answers)*

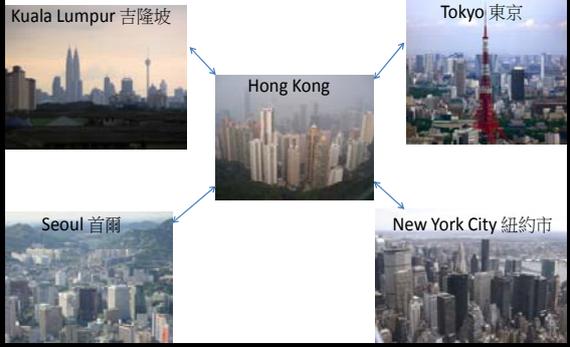
Slides for revising the English terms

How polluted is our air? 我們的空氣有多污染?



ELA Research Team, OUHK
February 2010

How polluted is our air when compared with other big cities in the world?



Sources of air pollution



Air pollutants 空氣污染物

- Carbon monoxide (CO) 一氧化碳
- Sulphur dioxide (SO₂) 二氧化硫
- Nitrogen dioxide (NO₂) 二氧化氮
- Lead 鉛
- Suspended particulates 懸浮粒子

Air-quality monitoring stations 空氣質素監測站



Which type of vehicles are using cleaner fuels, diesel vehicles or LPG vehicles?

Diesel vehicles 柴油車輛



LPG vehicles 石油氣車輛



Vocabulary

air pollution 空氣污染	air-quality monitoring stations 空氣質素監測站
air pollutants 空氣污染物	diesel vehicles 柴油車輛
carbon monoxide 一氧化碳	LPG vehicles 石油氣車輛
sulphur dioxide 二氧化硫	power stations 發電廠
nitrogen dioxide 二氧化氮	
suspended particulates 懸浮粒子	