

Lesson 1: Why is air quality so important?

Media article; vocabulary builder

*Canada's Government Launches World's First
Air Quality Health Index Program*



This article has been modified from www.ecoaction.gc.ca and www.davidsuzuki.org

No matter who you are, where you live or how healthy you are, the quality of the air you breathe each day can affect you. Everyone reacts differently to air pollution. Children, the elderly, and those with heart or lung disease (like asthma) have the most health problems from air pollution. But even healthy Canadians can feel the effects of poor air quality when they exercise or work outdoors.

We use energy in our homes for heating and for electricity to power our computers, televisions and lights. We also use energy to fuel our cars and trucks. Using energy in our homes and vehicles means that we are burning fossil fuels including gas, oil and coal. When fossil fuels are burned, they send harmful pollutants into the air. These pollutants include: particulate matter, nitrogen dioxide, and sulphur dioxide.

Breathing pollutants created from burning fossil fuels can cause problems for your lungs and heart. You may:

- become short of breath – this feels like you cannot get enough air;
- wheeze; and/or
- have an asthma attack.

Air pollution has been associated with the rising levels of asthma. In Canada, rates of childhood asthma have risen a lot. From 1978 to 1995, the percentage of children with asthma increased from 2.5 percent to 11.2 percent. That means the number of cases of asthma has more than doubled over the past 17 years.

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Media article; vocabulary builder (continued)

By reducing our use of energy in our homes and vehicles, it is possible to reduce the air pollution being created. So reducing energy use can lead to better health.

You can also protect your lungs from harmful air pollution by checking the Air Quality Health Index at www.airhealth.ca every day. It tells you how safe the air is to breathe and whether it is a good day for exercising outside.



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Student worksheet

Part 1 - Vocabulary Builder: Find the meaning for the following words. You can find the words by using a dictionary or the 20/20 Glossary of Terms. Write your answer in the space provided.

	Word	Definition
1	Disease	
2	Asthma	
3	Energy	
4	Particulate matter	
5	Sulphur dioxide	
6	Wheeze	

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Student worksheet (continued)

Part 2 - Comprehension: Are the following statements true (T) or false (F)?

	Statement	T	F
1	Children, the elderly, and people with heart and lung disease are most affected by air pollution.		
2	Healthy Canadians do not feel the effects of air pollution.		
3	Heating our homes does not cause air pollution.		
4	Sulphur dioxide is released into the air by burning fossil fuels.		
5	The number of cases of children with asthma has more than doubled over the past 17 years.		
6	A good way to protect yourself against air pollution is to check the Air Quality Health Index.		

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Student worksheet (continued)

Part 3 - Application: In a small group of 3 or 4, discuss the following questions and be prepared to respond orally. Your classmates may have different answers than you and that is fine. No two people think alike and some of you may have different opinions. As long as you are careful to explain your answers, then you have a right to your own opinion. Be sure to listen to everyone else's answers too. There is enough space after the question to record some ideas.

- a) Where did the information come from for this article? Do you think this source is credible (believable)? Why or why not? Hint: Is the source a familiar person or organization?

- b) What would you do to encourage people to use less energy?

- c) Are Canadians likely to check the Air Quality Health Index to protect their health? Why or why not?

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Teacher instructions

(Note: this lesson requires the 20/20 Glossary of Terms)

Introducing the activity

- Hold up an empty 1 litre bottle of pop or container of milk. Ask students if they can guess how many litres of air the average adult breathes every day. Write their guesses on the front board. The answer, according to the Ministry of the Environment for Canada is between 15,000 and 20,000 litres every day (Source: www.ene.gov.on.ca/en/air/index.php). That is a lot of milk!
- Challenge students to tell you what they think they are breathing when they inhale air? Explain that air is a mixture of gases that makes up our atmosphere. You may wish to write the mixture on the board: nitrogen (78.09%), oxygen (20.95%), argon (0.93%), carbon dioxide (0.03%), trace gases (0.003%) and water vapour (varying amounts). (Source: www.airqualityontario.com/science/aqi_description.cfm)
- Ask students if they can tell you what they know about rising levels of carbon dioxide. Did they know that just as oxygen is essential for humans, carbon dioxide is essential for plants? Does it make sense that environmentalists are concerned about cutting down trees?

Ideas for teaching the article

- Invite students to look over, but not read, the article “Why is air quality so important?”. Ask them to identify where the information on the page came from (www.ecoaction.gc.ca; and www.davidsuzuki.org). You may wish to explain the importance of reading the URL before they read the article to determine how credible the information will be. Ask them to think about what ‘ecoaction’ and ‘David Suzuki’ indicate in terms of the website’s credibility. They will be asked to answer this on their worksheet. Ask students what they think “**gc.ca**” stands for. (“gc” indicates that the site is a “Government of Canada” site and “ca” refers to Canada.)
- Have students break into small groups of three or four and then read the article aloud. Have each group create two questions for discussion. The questions can be about the vocabulary, the ideas, or just general interest questions. You may wish to write their questions on a piece of chart paper and then invite the classroom to discuss possible answers to a few. Encourage students to be creative with their questions as they are just as important as their answers.

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Teacher instructions (continued)

Ideas for teaching the worksheet

- Copy and distribute one copy of the worksheet and the 20/20 Glossary of Terms to each group. Invite students to look at the worksheet with their group members to determine how it is organized and what kinds of questions they will be answering.
- When you are satisfied that students are comfortable with the material, ask them, in their small groups, to complete the worksheet. The answers to Part 1 and Part 2 are listed below. You can keep Part 3 simple or make it into a larger activity. For example, (c) can become part of a data management lesson. Students could create a survey that would help them understand whether students at their own school would be likely to consult the Air Quality Health Index. **(See Lesson 5 for a more comprehensive activity on the Air Quality Health Index).**

Answer Key for student worksheet – Part 1 (taken from 20/20 Glossary of Terms)

1	Disease	An illness or sickness of the body that causes the body not to function properly. For example, heart disease is an illness that causes the arteries that carry blood to the heart to become blocked.
2	Asthma	A breathing disease of the lungs. It causes shortness of breath, tightness in the chest, coughing and wheezing. It is triggered by things like dust, air pollutants and mould.
3	Energy	The ability to do work or the ability to move an object.
4	Particulate matter	A type of air pollution that includes dust, soot and tiny bits of solid materials that moves around in the air.
5	Sulphur dioxide	A colourless gas with a very strong smell. It is usually produced by burning coal. It pollutes the air when present in large amounts.
6	Wheeze	A breathing sound caused when the airways of lungs are blocked or swollen. It is a common sign of asthma.

Answer Key for student worksheet – Part 2

	Statement	T	F
1	Children, the elderly, and people with heart and lung disease are most affected by air pollution.	X	
2	Healthy Canadians do not feel the effects of air pollution.		X
3	Heating our homes does not cause air pollution.		X
4	Sulphur dioxide is released into the air by burning fossil fuels.	X	
5	The number of cases of children with asthma has more than doubled over the past 17 years.	X	
6	A good way to protect yourself against air pollution is to check the Air Quality Health Index.	X	