the air quality flag project

air quality health index learning stations

grades 5 and 6

airqualityflags.ca

Air Quality Health Index Learning Stations: to address literacy, reflection and problem-solving with awareness of the Air Quality Health Index.

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Table of Contents

How to use the Learning Stations

Set up

Set up six stations in your classroom where students can form groups. Place the Student Instructions and copies of the Student Handouts at each station.

Assessment summary

The independent nature of the learning stations will allow the teacher to circulate throughout the space to provide input and ongoing assessment of student progress. For evaluation purposes, handouts are provided at each station and a summary score sheet is provided at the end of this document.

Curriculum themes

A complete set of provincial and territorial curriculum links can be found at the end of the stations.

Describe ways to respond to, prepare for, choose outdoor activities for various weather conditions.

Identify safety precautions for activities and preventing ailments (e.g., effects of ultraviolet rays, hot sunny weather can lead to heat exhaustion and sunburn, cold weather and high wind-chill factors increase risk of hypothermia and frostbite, high AQHI can lead to respiratory problems).

Introductory Activity

Silent Fact or Fiction?

Summary:

This energizer will grab students' attention and get them moving and ready for learning about the Air Quality Health Index. It is intended to get them interested and bring out misconceptions. If desired, the activity can be repeated as a review activity after students have completed the learning stations.

Before you start:

Explain to the class that they are going to do a Silent Fact or Fiction. One wall of the classroom is going to be labelled "Fact" and the other one is going to be "Fiction". Place an example on the overhead and/or read it aloud. Students must then move silently but quickly to the region of the room that they guess is the correct answer. The teacher can then reveal the truth before moving to the next one. It is best to avoid explanations at this point because students will learn more for themselves in the learning stations.

Adaptation:

Teachers can adapt this activity to meet the exact needs of their classrooms. One example would be to choose a student to keep score. Teachers might also choose a student to record a noise score or take off points on the class score for any noises.

As you review

If used as a review at the completion of the learning stations, teachers may choose to have each student write their name and a statement on a piece of paper, indicating in brackets if it is fact or fiction. Then, the teacher can draw these statements from a hat for the Silent Fact or Fiction. This would highlight residual misconceptions on an individual basis.

Fact

- There is an air index that is like the UV index, only it tells us about the health risk from air pollution for the day.

- AQHI is part of the forecast. (There is a maximum forecasted value for today, tonight and tomorrow).

- AQHI is based on the risks of common air pollutants that harm human health.

- A common air pollutant that harms human health is dust (particulate matter).

- Air pollution can make asthma symptoms worse.

- Air pollution is a problem throughout the seasons.

- A full bus takes 40 to 60 cars off the road.

- Running your gas powered lawnmower for 1 hour is equal to driving a new car between 320 and 480 kilometres.

- Some people are more sensitive to air pollution.

- The shape of the land can allow pollutants to be trapped in basins and valleys.

- High UV radiation creates more ground-level ozone, which is a pollutant.

- For high UV you cover up and add sunscreen; for high AQHI you change your plans.

- A blue air quality flag means it's a good day to play outside.

Fiction

- For AQHI, the lower the number, the greater the health risk associated with the air quality. (AQHI of 2 is worse than AQHI of 10).

- A common air pollutant that harms human health is oxygen.

- Blue is used to show a very high health risk from air quality.

- Air pollution is an issue for cities. People who live in rural areas are not affected.

- Children are the least sensitive to the adverse health effects of air pollution.

- Strong winds allow pollutants to build up over an area.

- Weather does not affect air quality.

- A brown flag means you can only play outside for an hour.

Questions

1. There is an Air Quality Health Index that is like the UV index, only it tells us about the health risk from air pollution for that day.

2. Air pollution is an issue for cities. People who live in rural areas are not affected.

3. AQHI is based on the risks of common air pollutants that harm human health.

4. A common air pollutant that harms human health is dust.

5. AQHI is part of the forecast.

6. Air pollution makes asthma symptoms worse.

7. For AQHI, the lower the number, the greater the health risk associated with the air quality. (AQHI of 2 is worse than AQHI of 10).

8. A common air pollutant that harms human health is oxygen.

9. Weather does not affect air quality.

10. For high UV you cover up and add sunscreen; for high AQHI you change your plans.

11. Children are the least sensitive to the adverse health effects of air pollution.

12. High UV radiation makes more ground-level ozone, which is a pollutant.

13. The shape of the land can allow pollutants to be trapped in basins and valleys.

14. Strong winds allow pollutants to build up over an area.

15. Running your gas powered lawnmower for 1 hour is equal to driving a new car between 320 and 480 kilometres.

16. Blue is used to show a very high health risk from air quality.

17. Air pollution is a problem throughout the seasons.

18. A full bus takes 40 to 60 cars off the road.

19. A blue flag means it's a good day to play outside.

20. A brown flag means you can only play outside for an hour.

Answers:

1. Fact 2. Fiction 3. Fact 4. Fact 5. Fact 6. Fact 7. Fiction 8. Fiction 9. Fiction 10. Fact 11. Fiction 12. Fiction 13. Fact 14. Fact 15. Fiction 16. Fact 17. Fact 18. Fiction 19. Fact 20. Fiction

Station 1: Science in the News

Summary

Students read about air quality in the news and reflect upon their readings. They describe ways to respond to, prepare for, or choose outdoor activities for various air quality reports.

Real world connection

Connects science to everyday events in the news and teaches strategies for science literacy.

Curriculum themes

- Describe ways to respond to, prepare for, choose outdoor activities for various air quality flag days.
- Identify safety precautions for activities and preventing ailments (high AQHI can lead to respiratory problems).

Materials

Highlighters (At least two colours)

Preparation

Student Instructions (1) Student Handout 1 (1 per student) Print one (1) copy per group of each of the following articles and place them at the station.
The articles have been selected to provide a large variation in the level of reading difficulty and length to provide a challenge to all students.

Article sources

Heat event articles

http://www.chathamdailynews.ca/2013/09/10/mother-natures-hot-flash-hits-southwestern-ontario-with-heat-warning

http://www.yorkregion.com/news-story/4072432-heat-humidity-prompts-cautionary-advisory/

Cold weather articles

http://www.cbc.ca/news/health/hypothermia-a-killing-cold-1.1064076

http://www.cbc.ca/news/technology/how-to-avoid-a-wintertime-injury-1.726394

Wind articles

http://www.cbc.ca/news/canada/british-columbia/major-storm-prompts-b-c-wind-rainfall-warnings-1.1872124

http://news.nationalpost.com/2013/01/23/toronto-posts-coldest-temperatures-in-two-years-as-wicked-cold-snap-continues-to-grip-ontario/

Air Quality articles

http://www.thereflector.com/home_scene/article_0646209a-3115-11e3-b184-001a4bcf887a.html

http://www.edmontonjournal.com/Refinery+smoke+prompts+quality+advisory+Edmonton+area/8942932/story.html

Station 1: Student Instructions

1. There are a variety of news articles for you at this station. Each student will choose and read a different article.

2. Complete the **Station 1 handout**. As you do, talk with each other about your work. How will you figure out the answers? What words or clues in the articles help you find what you are looking for?

3. Share the safety tips for different weather or conditions with the other members of your group.

Station 1: Student Handout

After you read the news story, fill in the boxes.

I read...	I thought...
I was confused by...	This reminded me of...

1. Is your news story based on scientific research? (Circle the answer) YES / NO

2. How can you tell?

_____

_____

_____

3. Highlight the main idea or conclusion of your news story.

4. In a different colour, highlight the safety tips given.

5. On the back of this sheet, draw an important part of the news story.

6. What question would you ask the researcher or expert from this article?

Station 1: Draw your picture here.

Station 2: Jumping to Conclusions

Summary

Students describe and predict local air quality conditions using real-time weather data. Then they are introduced to writing conclusions and the language of science using a research-based twist to complete the sentence.

Real world connections

- Collecting data in real-life contexts.
- Using evidence to develop predictions and explanations.

Curriculum themes

- Describe and predict local weather conditions.
- Gather information about weather conditions for various regions of Canada.
- Strategies for recording, using, and interpreting information.
- Use a variety of observation techniques and tools.

Materials

Student Instructions (1)

Student Handout 2 (1 per group or 1 per student)

Bookmark the following website on the in-class browser: Environment Canada Weather Office Website www.weather.ec.gc.ca

Station 2: Student Instructions

To complete the **Station 2 student handout**, please read the following information about air quality and health tool available to Canadians - the Air Quality Health Index.

Air Quality Health Index

The Air Quality Health Index (AQHI) is a tool that helps Canadians protect their health from air pollution. It assigns a number and a colour that helps people know the health risk that air pollution poses that day. To get the number, scientists measure toxic gases and dust in the air. The higher the number, the greater the risk from air pollution, and the greater the need to change your activities.

Blue Day			Gray Day			Brown Day				Red Day
1	2	3	4	5	6	7	8	9	10	+
Low Risk			Moderate Risk			High Risk				Very High Risk

Station 2: Student Handout

Using your computer browser, connect to Environment Canada's Weather Office at **www.weather.ec.gc.ca**

Record the current conditions in the community where you live. Also choose and record conditions from another city in Canada.

Item	My Community	Other Canadian City
Date:		
Time:		
Temperature:		
Air Quality Health Index:		
Wind speed:		
Sunny or Cloudy?	Sunny _____ Partly cloudy _____ Cloudy _____ Precipitation _____	Sunny _____ Partly cloudy _____ Cloudy _____ Precipitation _____

Use one colour to highlight any similarities between the two cities. Are the temperatures similar? Is the Air Quality Health Index similar?

If you were travelling to the other Canadian city you have chosen for a walking tour, how would you prepare for the visit? What would you bring?

_____

_____

Canada is a large country. How do you think scientists and meteorologists collect information about the weather in so many regions?

_____

_____

Station 3: Let's go to work

Summary

Students use narrative to reflect on how they make decisions and communicate their personal, family and community attitudes towards healthy lifestyles and safety.

Real world connection

Begin to think about and explore potential careers. Consider how air quality and weather affects an individual's daily choices.

Curriculum themes

- Identify factors that influence attitudes and decisions regarding healthy lifestyles (ex. media, family, peers).
- Reflect on and communicate personal, family, and community attitudes towards safety.

Material

Set of dice

Preparation

Student Instructions - 1 per station

Student Handout - 1 per student

AQHI Health Message chart - 1 per group

Station 3: Student instructions

Do you know what you want to be when you grow up? Any idea where you would like to live? In this activity, you will explore some different career choices in different parts of Canada, and then consider how the air quality in that city might affect your job and your life.

1. In the table, there are four (4) categories (Careers, Community, Age, Health, and AQHI). In each category, there are six options. Each player will take turns rolling the die to see what they get for each category.

2. Start with the Career category. Roll the die and select the matching option. For example, if you roll a three, then you are a teacher. If you roll a 6, you are a doctor specializing in asthma. Record the career on your Student Handout Sheet.

3. Take turns rolling the die for the Community category. Record your city on the **Student Handout**. If you roll a 2, then you live in Sydney, N.S. If you roll a 5, you live in Trois Rivière, Québec, etc.

4. Continue with each of the categories, with each person rolling the die and recording their results on their Student Handout Sheet. Now, every person has a career, a city to live in, a relative age, understands any health problems they may have and knows what the Air Quality Health Index is for that day.

5. Complete the Student Handout. Pretend you are giving tips to a new person on the job about how you prepare for your day. Use the Air Quality Health Index (AQHI) health message chart on the next page to learn more about how the air quality affects your choices.

Roll	Careers	Community	Age	Health	AQHI
1	Construction worker	Windsor, ON	20-40	Healthy	Blue Day (1)
2	Professional soccer player	Sydney, NS	20-40	Healthy	Blue Day (3)
3	Teacher	North Vancouver, BC	40-50	You have a cold and sore throat	Grey Day (4)
4	Landscaper	Winnipeg, MB	40-50	You have mild asthma	Grey Day (6)
5	Day care specialist	Trois Riviere, QC	60-80	You have severe asthma	Brown Day (8)
6	Doctor with specialty in asthma	Fort McMurray, AB	60-80	You have a mild heart condition	Red Day (10)

Blue Day			Gray Day			Brown Day				Red Day
1	2	3	4	5	6	7	8	9	10	+
Low Risk			Moderate Risk			High Risk				Very High Risk

	At risk population	General Population
Blue Day 1-3	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.
Grey Day 4-6	Consider reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.	No need to modify your usual outdoor activities unless you experience symptoms such as coughing or throat irritation.
Brown Day 7-10	Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Red Day 10+	Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	Reduce or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

Station 3: Student Handout

Name: _____
Career: _____
Community: _____
Age: _____
Health: _____
AQHI: _____

Write an e-mail to the new person, giving them tips about how to prepare for the job each morning and keep a healthy lifestyle and safe workplace.

Include: preparations, clothes/gear, air quality, weather.

Help the rookie make the right choices by telling them who influences your decisions (e.g. media, family, peers).

Some of the things I do at my job are;

_____

_____

The weather and the air quality affects my job quite easily because;

_____

_____

So, when I get up in the morning, I prepare for my day by;

_____

_____

I try to make the right choices for a healthy lifestyle and safe workplace. Sometimes other people help me make my decisions. For example;

_____

_____

Station 4: Air Qualitopoly (kind of like Monopoly)

Summary

Students use co-operative learning to design a board game that will focus on air quality and sun health in Canada.

Real World Connection

- Experience a design process.
- Consider the details in game design.
- Be exposed to a wide variety of air quality health impacts that may affect student decisions related to dressing, activity choices and friends and family.

Curriculum Themes

Identify appropriate clothing and safety precautions for various outdoor activities and weather conditions.

Materials

At least one large piece of construction paper, cardboard or bristol board to serve as a game board, per group

A wide variety of markers, crayons, highlighters, pens, pencils and other writing/ colouring tools for the game board designs

A selection of random objects to serve as game pieces (such as crayons, pebbles, erasers, pennies, paper clips, etc. Or you can create air flag game pieces.)

Scissors

Glue, tape and other craft supplies

Preparation

Student Instructions (1)

Student Handout 5 (1 per group)

Air Quality Impact Cards (1 per group)

Station 4: Student Instructions

Do you know how to play the game Monopoly™?

Your group is going to design an air quality and sun health board game like Monopoly. You will consider how the Air Quality Health Index (AQHI) can be used to make decisions about what sports or activities you do, and how air quality affects your health and the health of your friends and family.

Work as a team to plan a few things that make a board game unique, such as how many spaces you need, what your game pieces will look like, and (of course) how you will win! Each group is going to design their own game. We'll call it a "mock-up". When the mock-ups are complete, each group will present to the class and students can vote on the the preferred game. The class can then create a more permanent game.

Cooperative Roles:

Reader: Reads the instructions.

Task Manager: Makes sure members do their roles.

Illustrator: Sketches ideas from the group.

Time Keeper: Makes sure the group finishes on time.

Materials Manager: Collects and manages materials for the group.

Presenter: Presents ideas to the class.

Get Started

1. Select a large piece of construction paper or cardboard as your game board and decide how you will lay out the spaces for the game (e.g. Around the edge? In a circle?) Be as creative as you want!

2. Where will the **Start** and **Finish** of the game be?

3. Choose 3 or 4 special spaces. Decide what you want to happen when someone lands there. They may have to sing a song, miss a turn, not talk for one minute, etc. Don't forget to write it on the space!

4. Use the **Air Quality Health Impact Cards**. Cut them out and stack them. As a group, use the blank squares to create at least five new impacts that you can add to your game. Add the cards to your stack, mix them up and place them on the board.

5. Select game pieces from whatever you have available in the classroom (ex. chalk, pencils, pennies).

6. Decide how to start the game. Will it be the person whose birthday is closest or whoever rolls the highest number on the dice?

7. Pick a name for your game.

8. Get ready to present your game to the rest of the class by filling in the **Student Handout Sheet**.

Station 4: Student Handout

1. What is the name of your game? (Make sure the name has something about air quality in it!)

2. What is the objective of your game? (How do you win the game?)

3. What materials do you need in order to play the game? (game pieces? dice? what else?)

4. How long do you think it will take to play your game? (15 minutes? 30 minutes? If you're not sure, what is another board game that you know that probably lasts the same time?)

5. What are the rules for your game?

6. How will you decide who will start the game?

7. How many turns can a player take in a row?

8. When does a player pick up an Impact Card? After each roll, or just when he/she lands on a certain space?

9. Do you use two dice or just one?

10. Do you play individually or in partners?

Station 4: Air Quality Impact Cards

The AQHI is 6 in your community. Move back 2 spaces to wait for better air quality.	It is a VERY sunny day and you applied sun screen 30 minutes before going outdoors. Move forward 3 spaces!	You have learned how to use the AQHI! Congratulations! Move forward 2 spaces.
AQHI is 4 in your community, but you have asthma so you are at risk if you play outdoors. Move back 1 space to represent staying indoors for the day.	You were planning on going cycling with your grandparents, but you need to reschedule because your grandmother has a cough and the AQHI is 7. Move back 2 spaces.	You have a soccer game today and the AQHI is 8! The soccer club decides to wait until the AQHI goes down to 3. Move back 1 space.
The AQHI is 2, and you have another soccer game. Move forward 2 spaces because risk is low.	There is a strong odour in the air. Move back 1 space.	You convince your principal to have the AQHI reading included as part of the morning school announcements. Move forward 3 spaces.
Your class and teacher work together to create a YouTube video about air quality in your community. Move forward 3 spaces.	You and your class organize an air quality awareness presentation for the entire school. Move forward 3 spaces.	You and your family go to the beach and forget the sunscreen. Move back 2 spaces.

Congratulations. You choose to ride your bike to school instead of driving, to help improve air quality. Move ahead 2 spaces.	 You encourage your teacher to check the AQHI before your class goes outside for recess. Move forward 2 spaces.	Make your own impact cards below!
		
		

Station 5: Kids know best

Summary

Students identify and solve local environmental health issues by engaging in a collaborative, problem-solving cycle.

Real-world connection

- Gives a true sense of the process and issues that come up when solving real problems in a community.
- Encourages reflection on the people and factors involved in real life issues.

Curriculum Themes

A complete set of provincial and territorial curriculum links can be found at the end of the stations.

- Assess the effects of environmental factors on human health.
- Propose ways in which individuals can reduce the harmful effects of these factors and take advantage of those that are beneficial.

Materials

Optional: Additional resources with information on communities who have tried and/or data to support the fact cards.

Preparation

Student Instructions (1)

Student Handout 6 (1 per group)

Fact Cards (1 set):

1. Idling and anti-idling laws
2. Using fans instead of air conditioning
3. Slowing down (Drive 20% slower)

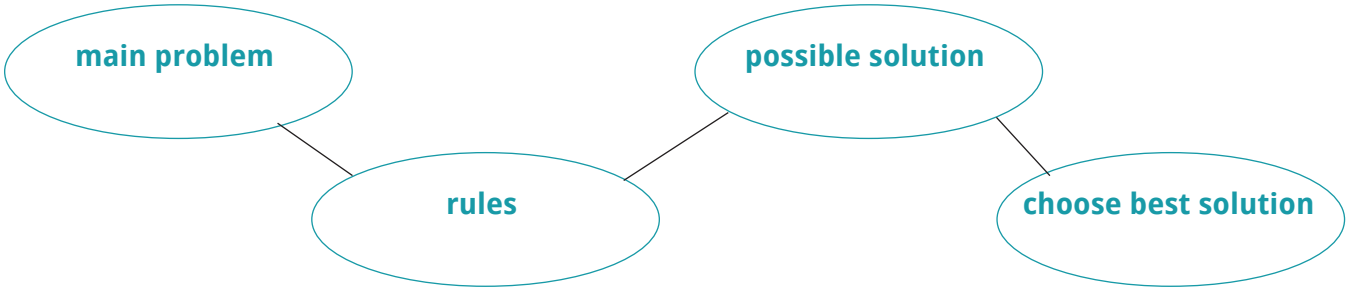
Set up

There are two ways to set this up. One is to have each group who arrives at the station to start from scratch with the materials provided. The other is to have each newly arriving group pick up where the last group left off, bringing the class as a whole closer to a solution. Both methods will work for you.

Station 5: Student Handout

Something is wrong and you are going to come up with a solution. A real one that applies to your school, your town, and you. It's a problem-solving cycle that you can use for anything from large community projects to convincing your parents to let you go to a movie.

The cycle keeps going until you solve the problem. It looks like this:



The Problem

The gym teacher has checked the AQHI and noticed it was an 8, a brown day. Outside there are lunchtime sports games going on. But some of the children are coughing and wheezing. Heavy local traffic, along with smoke from a fire that is burning in the area, are impacting air quality.

You make the rules

When we do things, we all have some rules to follow. When you are a child, adults give you new rules for almost every thing you do. For example, you can go outside to play in the sun, but the rule is that you need to put on sunscreen.

You need to make a list of rules to help solve this problem. Your solutions to the problem have to follow your rules. Some ideas for rules are that the solution has to:

- Be Safe
- Be Legal
- Be Fast
- Be Cheap
- Fix the Pollution

List your rules across the top of the table provided on your handout

Possible Solutions

Kids can come up with great solutions that adults might not ever think about. As a group, think of possible solutions to the problem and list four of them in the table under “solution”.

Here is a list of possibilities to get you started but please feel free to use your own. You will get another chance to do this again later.

- No idling: No idling laws for when parents pickup and drop-off students.
- Use fans.
- Slow down: Drive 20% slower - it saves on fuel and emissions.

Pick one solution each and become an expert on it

Use the Fact Cards and additional materials provided by your teacher to learn about that topic. Then, give it a plus (+), minus (-) or neutral (0) to show if the solution follows the rules.

Choose the best solution

Draw a star beside it or highlight it on the table.

Have you solved the problem yet? If you have time, repeat the process again until you do.

Station 5: Fact Cards

No Idling

Idling for more than 10 seconds uses more fuel than restarting your engine. Most cars and trucks require only 15-30 seconds of idling before being driven, even in winter. 45 seconds of idling uses roughly the same amount of fuel as driving a kilometre.

The first city in Canada to implement an anti-idle law was the City of Toronto in 1996. Since then, several cities in Canada have passed legislation on idling.

www. drivewiser.ca

www.nationalpost.com

www.on.ec.gc.ca/skywatchers

www.NovaNewsNow.com **www.nrcan.gc.ca**

Use Fans

Save fuel by using air conditioning only when needed in a vehicle and buildings. Fans use much less energy.

Roll down the windows when driving in the city. On the highway, close the windows and use fans or a lighter setting of air conditioning.

You use 3-5% more energy for every degree your air conditioner is set below 27C.

www.energystar.gov

http://wikihow.com/Use-Window-Fans-for-Home-Cooling

http://www.ec.gc.ca/cleanair-airpur/Facts-WS2309FEF9-1_En.html **www.on.ec.gc.ca/skywatchers**

www.drivewiser.ca

Slow Down

You can use less fuel and make less pollution by driving slower. When on the highway, driving between 90km/hr and 100km/hr can reduce fuel consumption by up to 30%. Also, avoiding quick starts and stops uses less fuel.

www.drivewiser.ca

www.on.ec.gc.ca/skywatchers

Station 5: Student Handout

1. List your rules across the top of the table.

2. List your four possible solutions along the side.

3. Read the fact sheets. Use a plus (+), minus (-), or neutral (0) in the following table to show if the solution follows your rules.

4. Choose the best solution. Draw a star beside it or highlight it on the table.

	Rules
Solution	
A.	
B.	
C.	
D.	

BACKGROUND INFORMATION for Teachers

Air Quality, Smog, Pollution and Our Health

What is air quality?

Air is made up of different gases (78% nitrogen, 21% oxygen, 0.09% argon, 0.03% carbon dioxide, and the remaining 0.07% is a mixture of water vapour and other trace components). Air quality describes the level of air pollutants in the air. Air pollutants can become dangerous to human health if people are sensitive to elevated levels of pollutants or are exposed to them for extended periods. To reduce risks, people need to know when pollutants are present and in what concentrations.

What is smog?

Most pollution that we know about is usually invisible, meaning we can't look at the air and determine how much pollution is in it. However, sometimes pollution concentrations can be so high you can actually see it in the air. If you live in a large city, often in the summer, the pollution in the form of smog can be seen hovering over the skyline. Smog, whether visible or invisible, is a mixture of different pollutants that can be seen as a brownish yellow or greyish white haze in the air. The two key components of smog are particulate matter and ground level ozone.

What is particulate matter?

Sometimes very, very tiny solid or liquid particles are suspended in the air and these are referred to as particulate matter. These include dust, dirt, soot, smoke and tiny particles of chemical pollutants. This kind of particulate pollution comes from power plants, trash incinerators, motor vehicles, construction activities, forest and natural dust blown by the wind. In large cities where there are a lot of vehicles, the particulate matter can be worse than in rural areas.

What is ground level ozone?

Ozone, like oxygen, is a colourless gas that cannot be seen in the air. High in the atmosphere, ozone forms a barrier to harmful solar radiation. Ground level ozone, however, is formed from other pollutants already in the air when they mix with sunshine, and so ozone concentrations are normally higher in the summer. Ozone is harmful to people, animals, plants and other materials.

How is air quality measured?

Environment Canada scientists assess air quality by collecting and analyzing air samples taken from near ground level. Pollutant levels are affected by such factors as emissions sources, weather conditions and topography. Environment Canada scientists have developed complex computer models that now provide air quality forecasts for major centres in Canada.

How does air pollution affect health?

Your lungs inhale all things in the air around you, including particulate matter and ground level ozone. If you are sensitive to high pollution levels, you may experience symptoms that are unpleasant or even dangerous. How do you know if you are sensitive? People with diabetes, lung disease (such as asthma, chronic bronchitis, emphysema, lung cancer) or heart disease (such as angina, a history of heart attacks, congestive heart failure, arrhythmia or irregular heartbeat) are more sensitive to air pollution than the average Canadian.

Seniors, too, are at higher risk because of weakening of the heart, lungs and immune system and increased likelihood of health problems such as heart and lung disease.

Children are also more vulnerable to air pollution: they have less-developed respiratory and defense systems. Because of their size, they inhale more air per kilogram of body weight than adults. Children also spend more time outdoors being physically active, which can increase their exposure to air pollution.

Finally, people participating in sports or strenuous work outdoors breathe more deeply and rapidly, allowing more air pollution to enter their lungs. They may experience symptoms like eye, nose or throat irritation, cough or difficulty breathing when air pollution levels are high.

What is the Air Quality Health Index?

The Air Quality Health Index is a scale designed to help Canadians understand what the quality of the air around us means to our health. It is a new tool developed by health and environmental professionals to communicate the risk to health posed by air pollution. Everyone is affected by air pollution differently so some of us are at a higher risk than others.

The index provides specific advice for people who are especially vulnerable to the effects of air pollution as well as the general public.

The Air Quality Health Index is measured on a scale ranging from 1 to 10+:

1-3 = Low health risk

4-6 = Moderate health risk

7-10 = High health risk

Above 10 = Very high health risk

The Air Quality Health Index is designed to help us make decisions to protect our health and the environment by:

- Limiting short-term exposure to air pollution
- Adjusting our activity during episodes of increased air pollution and encouraging physical activity on days when the index is lower
- Reducing our personal contribution to air pollution

AQHI and the weather

The greatest potential for high risk Air Quality Health Index (AQHI) days occurs when several weather conditions come together resulting in a deterioration of air quality.

Wind speed plays a role in diluting pollutants. Generally, strong winds disperse pollutants, whereas light winds generally result in stagnant conditions allowing pollutants to build up over an area.

Inversion or 'stagnant' conditions are commonly associated with major air pollution episodes. Under normal conditions, the air near the surface is warmer. The warmer air rises and mixes with the above cooler air. This condition is known as 'unstable.' Inversions can develop when a warmer, less dense air mass moves over a cooler, denser air mass creating a temperature inversion where the air is now cooler closer to the surface. Pollutants are unable to mix vertically and will stay pooled near the ground due to these 'unstable' conditions. Inversions can persist for hours or days.

Topography can create conditions that allow the trapping of pollutants. At night, cold air tends to drain downhill, settling into low-lying basins and valleys. Unable to rise, the cool air settles and accumulates in these valleys, trapping air pollutants.

Long-range transport or transboundary transport of air pollution is a significant problem in Canada. Winds coming from the United States (south) and industrialized areas of Ontario and Quebec can result in higher levels of air pollutants in neighbouring Canadian cities.

Clear, cloudless skies allow more sunlight or UV radiation to penetrate the Earth's surface. Higher intensity of sunlight allows for more photochemical reactions to occur producing high levels of ground-level ozone, which is one of the pollutants measured in the AQHI.

British Columbia Curriculum Outcomes:

- Health:

Healthy Living
Goals and Decisions

- Describe how various factors (eg. access to accurate and relevant information, media and social influences) affect decision making.

- Identify factors that influence attitudes and decisions regarding healthy lifestyles (eg. family, peer, media

Safety and Injury Prevention);

- Describe how to remove or reduce hazards and risks for injury in a variety of settings, including on the road.

Additional information can be obtained at:

Environment Canada Inquiry Centre 351 St. Joseph Boulevard Place Vincent Massey, 8th Floor Gatineau, Quebec K1A 0H3 Telephone: 1-800-668-6767 (in Canada only) or 819-997-2800 Fax: 819-994-1412 TTY: 819-994-0736 Email: enviroinfo@ec.gc.ca

Contact for BC Air Quality Flag Program:

Glynn Brothen
Program Coordinator
AirShift Group
Kamloops, B.C.
250.372.5900 ext 1
glynn@airshiftgroup.com

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Jumping to Conclusions

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