Let's Talk Air
Resource Guide

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Air is an invisible, odourless, and tasteless mixture of gases that exist within Earth's atmosphere. All people need air to breathe, and rely on clean air to thrive. While air is primarily composed of two gases—oxygen and nitrogen, it also consists of other trace gases and contains many tiny particles and molecules. Air pollutants, such as dust, pollen, mould, and carbon monoxide can be contributors to poor air quality.

No matter who you are, where you live, or how healthy you are, the quality of the air you breathe can have an impact on your health. On average, Canadians spend 90% of their time indoors, which means it is important to strive for clean and healthy air within any enclosed space, such as houses, schools, offices, and indoor stadiums. The most effective way to improve your indoor air is to identify activities that can contribute to poor indoor air quality and remove or reduce the sources of indoor air pollutants.

About this guide

This resource will provide helpful information on air and guide you through a series of activities intended to spark curiosity and care for indoor air quality (IAQ). You will start by exploring the components and properties of air and why air is important for life on Earth. Next, you will research why good indoor air quality is important to human health and ways you can improve it.

Activities

Click on the following links to go directly to the corresponding activity:

Let's Talk Air

The Facts About Air and Indoor Air Quality

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Air

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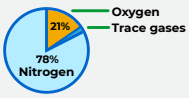


Air is primarily composed of two gases nitrogen (approximately 78%) and oxygen (approximately 21%). The remaining 1% of air is composed of other trace gases including carbon dioxide and hydrogen.

Air also contains many tiny particles and molecules. Air pollutants, such as dust, pollen, mould, and carbon monoxide can be contributors to poor indoor air quality.

Breathing (or respiration) is the process of moving air in and out of the lungs. Breathing helps humans to bring oxygen into the body and release carbon dioxide from of the body. All humans need air to breathe and rely on clean air to thrive.

Indoor air quality

Indoor Air Quality (IAQ) refers to the air quality within a building (such as a home or school), and often refers to how it affects the health and comfort of people within the building.

It is estimated that Canadians spend 90% of their time indoors. The health effects from indoor air pollution vary from pollutant to pollutant.

Understanding and reducing indoor air pollutants can help reduce the associated health risks for building occupants. Causes of poor indoor air quality can include smoking, heating, cooking, dampness and water leaks, activities that take place in an attached garage (e.g., idling car), poor ventilation, certain hobbies, household items, personal care products, or building materials.

Ways to maintain and improve indoor air quality include removing or reducing sources of air pollution (e.g., mould, smoking), improving ventilation, and filtering the air.

Want more information on indoor air quality and your health?

- Infographic: Maintain and improve indoor air quality (Health Canada) - English / French
- Carbon monoxide poisoning (Health Canada) - English / French
- Mould (Health Canada) - English / French
- Addressing moisture and mould in your home (Health Canada) - English / French
- Factsheet: Cooking and indoor air quality (Health Canada) - English / French
- Factsheet: Ventilation and the indoor environment (Health Canada) - English / French
- Improve indoor air quality in your home (Health Canada) - English / French

Let's Talk Air
Activity 1

What do I know, wonder, and want to learn about air?

Start by completing a **Know-Wonder-Learn (KWL)** chart about air. This can be completed by each individual student or as a whole class. Record what you already know, what you wonder, and what you want to learn about air. This chart can help guide further inquiry or research questions on air and the effects of air quality on health.

Know	Wonder	Learn

What is air composed of?

Air is a mixture of gases that exist within Earth's atmosphere. Below is a list of some important gases found in air. Do some research and describe each gas listed below.

Gas	Description
Oxygen	
Nitrogen	
Carbon dioxide	
Hydrogen	
Argon	

Air also contains tiny particles and molecules called air pollutants. Pollution is the result of many air pollutants collected in the air. Do some research and describe how each air pollutant listed below may affect human health.

Air Pollutants	Description
Smoke	
Fine particulate matter	
Mould	
Carbon monoxide	
Other (choose your own):	
Other (choose your own):	

Why is clean air important to human health?

Air is one of the most important elements to sustain life on Earth. For humans, the air we breathe not only helps us stay alive, it also determines the quality of life we live. Do some research and review the facts on page 2 of this resource to determine how humans rely on clean air to survive and thrive. Next, answer the questions below:

What is respiration?

Why is clean air important for human health?

What are some possible health effects from air pollution?

Let's Talk Air
Activity 4

How can we improve indoor air quality?

1. Referencing the ***Facts About Indoor Air Quality*** on pages 7-8, use the chart below to consider how a water leak, a poorly installed furnace, and bad ventilation might affect indoor air quality. Then describe ways to prevent risk to human health.

Issue	How might this affect indoor air quality?	What actions might minimize harm or prevent risk to human health ?
Water leak		
Poorly installed furnace		
Bad ventilation		

2. Have students raise awareness on the topic of indoor air quality with the school community through pledges, and communication campaigns. Consider making a poster, video, diorama, social media posts, etc.

Let's Talk Air

Facts About Indoor Air Quality

Exploring the effects of carbon monoxide, mould, and ventilation on human health

Carbon monoxide

Carbon monoxide (also known as CO) is a gas that does not have any smell, taste, or colour. It is produced when you burn fuel (e.g., oil, wood, natural gas). It is also contained in second-hand smoke. Carbon monoxide can be present indoors at any time of the year. However, the risk is greater in winter months because of the increased use of heating appliances that emit CO, such as furnaces, wood stoves, water heaters, and boilers. These appliances can release carbon monoxide indoors, if they are not installed or maintained correctly, or if they malfunction.

Carbon monoxide reduces your body's ability to carry oxygen in your blood, therefore, breathing in CO can cause health problems. Breathing in CO for an extended period of time can cause carbon monoxide poisoning with symptoms that range from tiredness, headaches, dizziness, and chest pain, and in very severe cases even death.

How to reduce the risks of carbon monoxide poisoning:

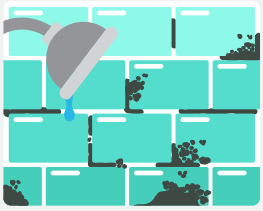
- Prevent smoking indoors.
- Keep the door between your house and garage closed and well sealed.
- Avoid idling your car, snowblower, lawnmower, or any gas-powered equipment in the garage.
- Do not use a barbecue or portable fuel-burning camping equipment inside a home, garage, vehicle, camper, or tent.
- Regularly maintain fuel burning appliances (e.g., furnaces).

Install a carbon monoxide alarm

Carbon monoxide can be detected by carbon monoxide alarms. This simple device can save your life!

- All homes, schools, business, and other buildings should have functioning CO alarms installed.
- All homes should have at least one working certified carbon monoxide alarm adjacent to sleeping areas.
- It is important to test your CO alarms regularly and to replace batteries and the alarm itself as recommended by the manufacturer.

Mould



Mould is the common word for any fungus that grows on food or damp building materials. Mould can grow in damp or wet areas in a building caused by water leaks, flooding, or high humidity that results from everyday activities like cooking or showering. It can grow on wood, paper, fabrics, drywall and insulation. When mould finds a damp place to grow, it can contribute to poor indoor air quality and health problems. Mould can cause eyes, nose and throat irritation, sneezing, difficulty breathing, and worsening of asthma symptoms.

How to prevent mould:

- Look for and fix any damp spots or leaks as soon as possible.
- Use kitchen and bathroom exhaust fans when cooking or showering.
- Keep humidity level between 30-50% indoors and, if needed, use a dehumidifier or air conditioner to reduce humidity levels.

For more information on how to address mould, please refer to:

Addressing moisture and mould in your home (Health Canada) - English / French

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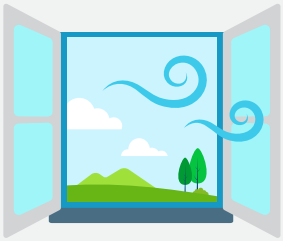
Ventilation



Ventilation is the movement of air into or out of homes and buildings. Proper ventilation is an important component of good indoor air quality. The best way to improve indoor air quality is to keep pollutants out. Ventilation improves indoor air quality by removing pollutants from inside the building and by bringing in fresh air from outside. Proper ventilation is especially important when renovating or when using chemical products indoors.

There are two types of ventilation: natural ventilation and mechanical ventilation.

- **Natural ventilation** is when air moves between inside and outside through open windows, doors, chimneys, vents, or cracks in the walls. An older home or building may have higher natural ventilation rates than newer buildings that are tightly built.
- **Mechanical ventilation** allows airflow by using fans, ducting, and designed openings in the house. Examples of mechanical ventilation include kitchen and bathroom fans, as well as heating, ventilation, and air conditioning (HVAC) systems.

Signs of low ventilation:

Ventilation of an indoor space may need to be increased if you notice:

- High humidity, for example if you see condensation on windows in winter.
- Mould growing in a house or in a building.
- Odours that linger, for example from cooking.
- General feeling of stuffiness.

Signs of high ventilation:

- Higher than average heating or cooling bills.
- Very dry air in winter.
- Moving of too much cool air from outside through cracks or openings (drafts) and discomfort.

How to improve indoor ventilation

You can improve your indoor air quality by doing the following:

- Opening windows, when possible. Check your local Air Quality Health Index (AQHI) before opening the windows.
- Let fans run after bathing or when cooking.
- Set your mechanical ventilation system to a higher setting, run longer, or, if necessary, have your ventilation system checked by a qualified ventilation contractor.
- Use furnace fan or, if necessary, a separate fan or air supply to make sure air is distributed throughout the indoor space.