THE ATMOSPHERE
OUT OF SIGHT, OUT OF MIND?

Environment Canada
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Environmental Citizenship

OUR PLANET'S MOST ESSENTIAL RESOURCE

Many people think the atmosphere is just the air we breathe. In fact, it's much more!

It's a natural greenhouse that holds the sun's heat near the Earth's surface, keeping our planet at just the right temperature.

It's a protective sunscreen that filters out most of the sun's harmful ultraviolet (UV) rays.

It's a pipeline that moves dust, particles and contaminants around the globe.

And it's a storehouse of all the gases that we need to survive.

There are many reasons why Earth alone - and no other planet in the solar system - is populated by living things. One of the most crucial reasons is that Earth has an atmosphere that is capable of supporting complex life forms.

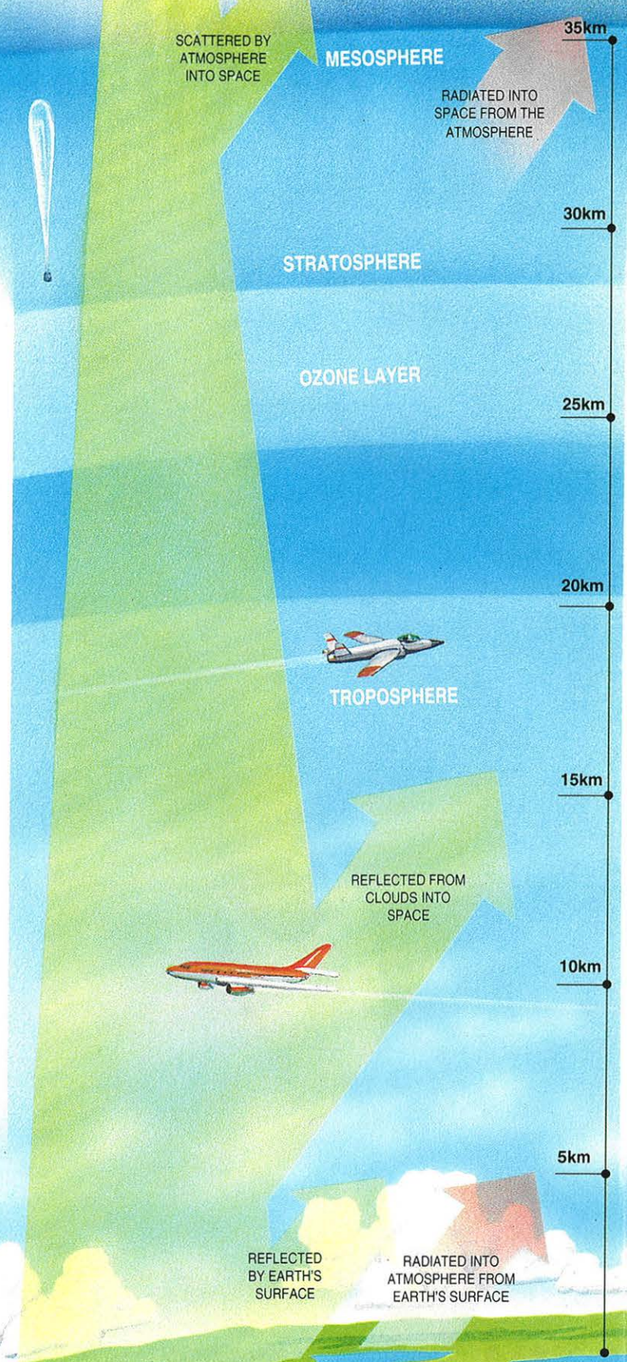
The atmosphere: it's our planet's most essential natural resource - something every person on Earth shares. It's worth protecting.

Did You Know?

Relatively speaking, Earth's atmosphere is about as thin as the skin of an apple. The top, about 50 km above the Earth's surface, gradually thins out into space.

What is the Atmosphere?

The atmosphere is a mixture of gases that surrounds our planet. When seen from space, it appears as a thin seam of dark blue light on a curved horizon.



The atmosphere is made up of layers which surround the Earth like rings. The **TROPOSPHERE**, extends from the ground to 15 km above the Earth's surface. It contains a good mix of life-giving gases, as well as most of the water vapour in the atmosphere. The **STRATOSPHERE** is located between 15 and 35 km above the ground. It contains the **OZONE LAYER** which acts as Earth's natural sunscreen. Ninety-nine per cent of the atmosphere is found in these two layers. The remaining one per cent of the atmosphere extends several hundred kilometres above the stratosphere. It includes layers referred to as the **MESOPHERE** and the **THERMOSPHERE**.

Did You Know?

Light from the sun is made up of many colours. You can see some of these colours in a rainbow. Others, like ultraviolet light are invisible. The gases in the atmosphere scatter blue light much better than red light. That's why the sky looks blue.

What Does It Do?

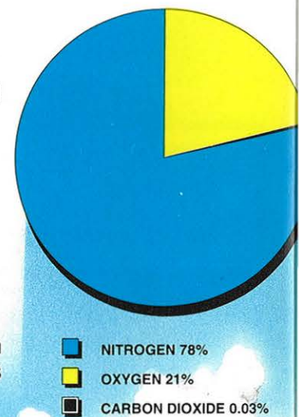
GREENHOUSE: When in balance, the gases in the atmosphere trap the sun's heat near the Earth's surface in exactly the right quantities we need to survive. We call this the natural greenhouse effect. If the gases did not absorb the Earth's heat, it would be lost into space.

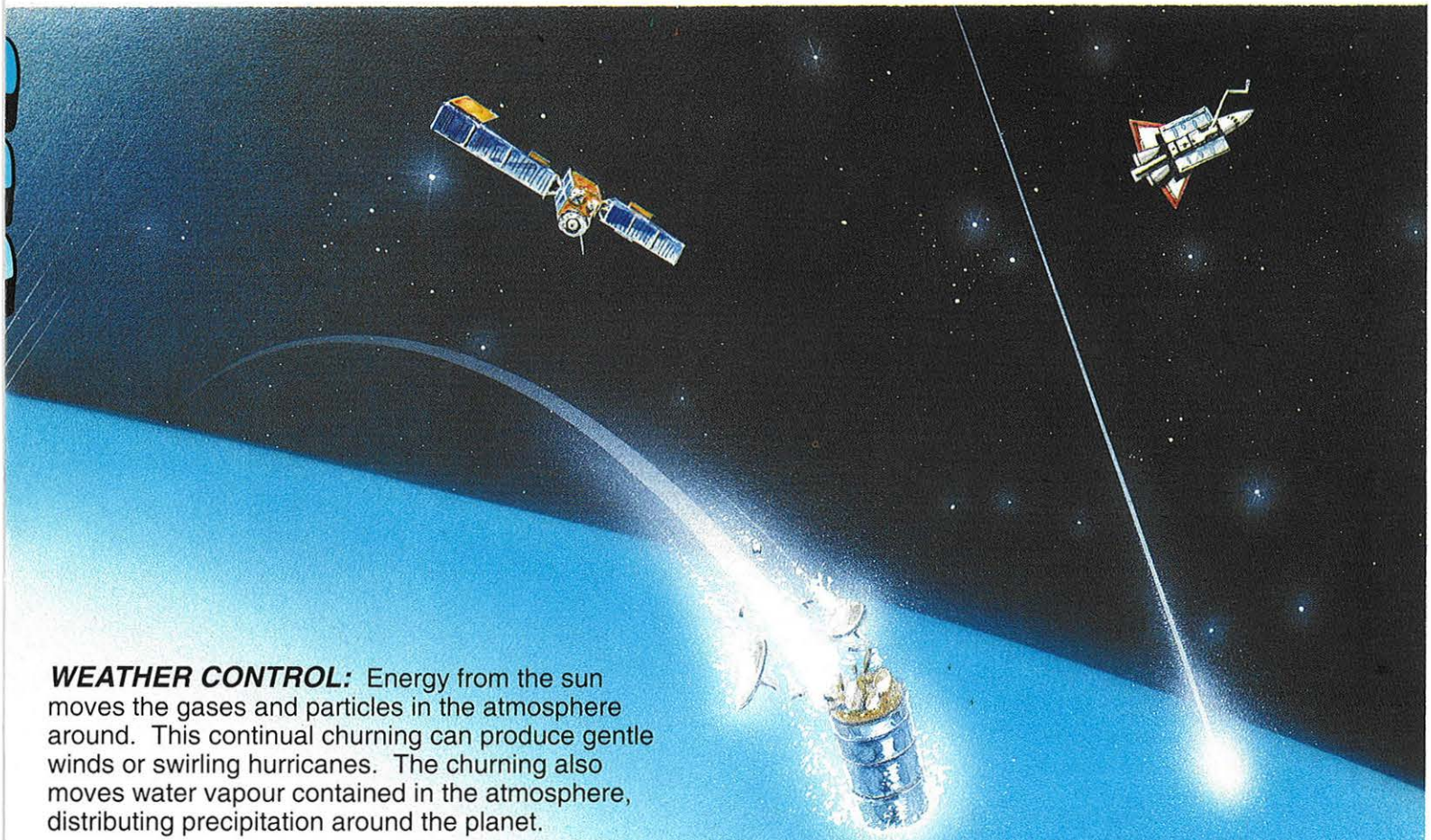
Fact: **Without an atmosphere the Earth's average temperature would be minus 18 degrees Celsius - too cold to sustain life.**

SUNSCREEN: Not everything produced by the sun is good for us. Some of the sun's rays, especially ultraviolet or UV rays, are harmful to living things. Certain gases in the atmosphere act as a sunscreen, especially OZONE GAS, and filter out UV rays. Protecting the OZONE LAYER means protecting ourselves!

PIPELINE: The atmosphere acts like a pipeline, carrying air, as well as dust particles and pollution around the globe. Some particles are natural, like volcanic ash. Others, like airborne pollutants, can come from human sources. The pipeline is fast and efficient, moving pollutants and particles over long distances. A dust storm in the Prairies can cast a haze clear to Canada's East Coast. Brown smog, known as Arctic Haze, is found over the High Arctic, far from where it was actually produced.

STOREHOUSE: Some of the essential gases stored in the atmosphere include NITROGEN (78%), which is converted by plants into usable protein. OXYGEN (21%) which is required by all plants and animals. CARBON DIOXIDE (0.03%) which is essential for plant growth. The atmosphere also contains variable amounts of WATER VAPOUR, which produces cloud and precipitation (rain and snow). It also contains many airborne particles, like dust and contaminants.





WEATHER CONTROL: Energy from the sun moves the gases and particles in the atmosphere around. This continual churning can produce gentle winds or swirling hurricanes. The churning also moves water vapour contained in the atmosphere, distributing precipitation around the planet.

SHIELD: The atmosphere shields the planet from meteorites, and space debris which usually burn in the upper atmosphere. About 1000 tonnes of space debris enter Earth's atmosphere every day.

Did You Know?

The fragile balance between the Earth and the atmosphere has existed for thousands of years. In the past 200 years, however, human activities have begun to change the make up of the atmosphere.

Upsetting the Balance?

Motor vehicles, industrial activities, home heating, burning garbage and other human activities introduce pollution into the air. When we burn fossil fuels like coal, oil and natural gas, they release large quantities of greenhouse gases, like carbon dioxide. Plants and trees absorb carbon dioxide. By clearing forests, Earth loses its natural ability to cleanse the atmosphere.

Out of Sight, Out of Mind?

Almost all human activity creates pollution. Many of the chemicals we produce go into the air - and they stay in our atmosphere, sometimes for hundreds of years. Because they move around so much, scientists find evidence of pollution in remote places, thousands of miles away from the actual source.

What's the Big Deal?

Our atmosphere seems to be getting stressed out:

- The world's climate seems to be changing and warming. Excess greenhouse gases from human sources, like carbon dioxide produced by burning fossil fuels, are causing the atmosphere to trap more heat.
- The ozone layer is being damaged and depleted, particularly over Antarctica. More harmful UV rays are reaching Earth.
- Soils, lakes, rivers and ground water are being damaged by acid rain in some areas.
- Plants, animals and even humans are being harmed by air pollution.

Want to Help?

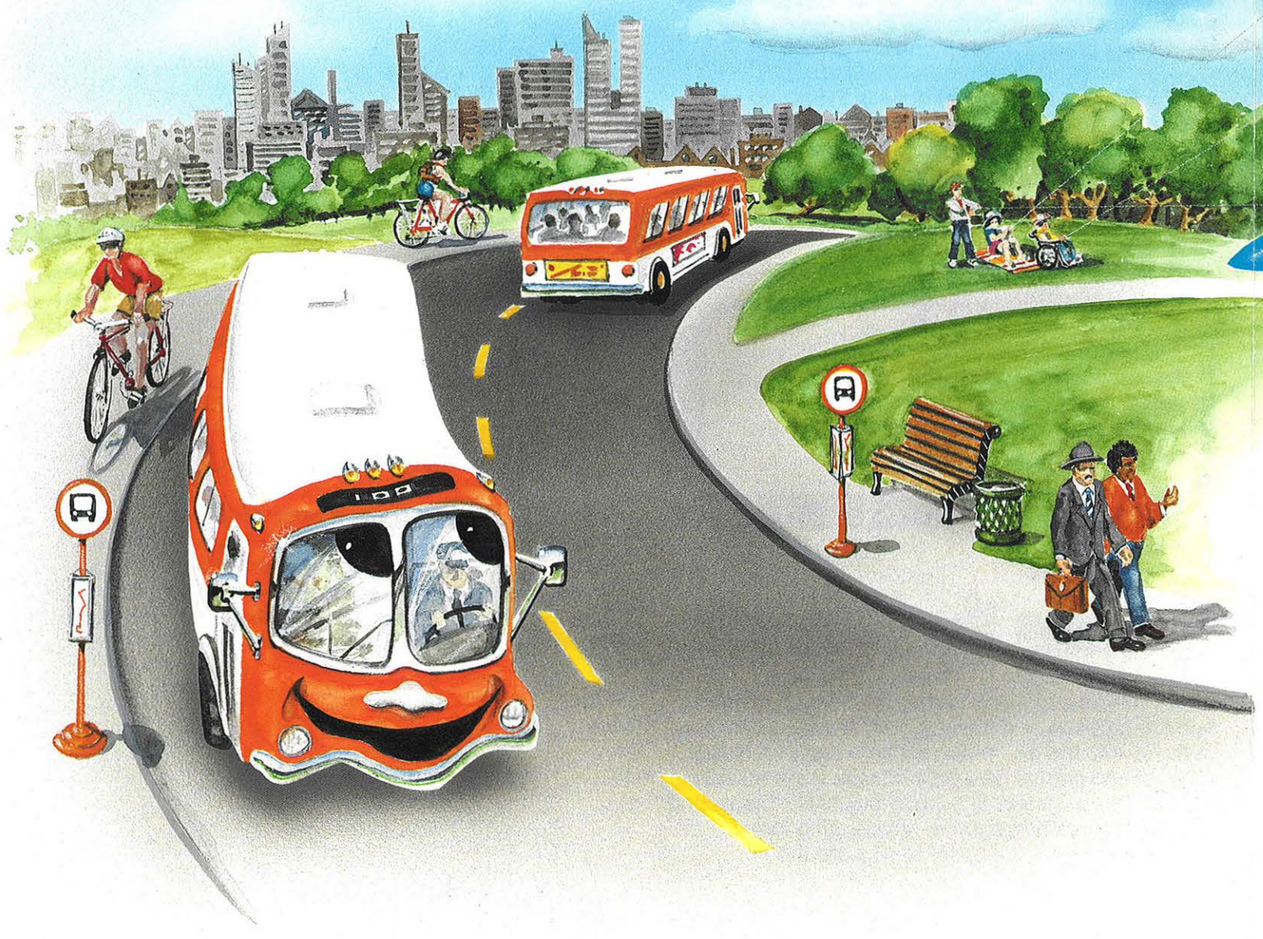
Many of our atmosphere's problems are GLOBAL problems. Our atmosphere is the world's most commonly shared resource, and it must be protected.

If cutting down trees affects the atmosphere, we should be sure to plant a new tree for every one that is cut down or burned.

If burning fossil fuels damages the atmosphere, we should find ways to use these fuels more efficiently. By saving energy, local and global atmospheric problems can be reduced.

Here are TWO SIMPLE THINGS YOU CAN DO TO HELP PROTECT EARTH'S ATMOSPHERE:

- Turn off unnecessary lights and appliances.
- Walk, ride your bike or improve your driving habits. Use public transit more often.



Go Fly a Kite!

Get family and friends together and have a kite rally in a local park. Attach streamers with environmental messages to the kites, and fly them high into the atmosphere.

True or False?

An energy balance exists between the Earth and the atmosphere.	T	F
Trees and plants absorb carbon dioxide and help clean the atmosphere.	T	F
We can see UV light.	T	F
The atmosphere can transport pollution over great distances.	T	F
Without the atmosphere, Earth's temperature would be minus 18 degrees Celsius.	T	F
The Ozone Layer is located in the Troposphere.	T	F

Environmental Citizenship

Protecting our atmosphere!

Environmental Citizenship is an initiative of Canada's Green Plan. Its goal is a society where individuals and groups have the knowledge and understanding that will lead to responsible environmental action.

This fact sheet is one of a series of *Environmental Citizenship "Snapshots"* on atmospheric change. The objective of the series is to provide bias-balanced information and practical suggestions for taking action.

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