**Factsheet**

**Biological pollutants and indoor sources**

**DON’T**

- Don't leave the windows open when plants are flowering if a lot of pollen comes inside the classroom.
- Don't wear the same clothes at home and at school if you have a pet at home.
- Never leave food or waste lying about in the classroom.

**DO**

- Always use a disposable tissue to cover your mouth when sneezing and coughing.
- Frequently give your hands a thorough wash with mild soap, and always wash your hands before eating.
- Ask adults not to smoke inside and tell them the risks to your health if they smoke near you.
Chemical pollutants and indoor sources

**DON’T**

Don’t stay for any length of time in a room while it is being painted

Don’t touch your eyes, nose or mouth with dusty or dirty hands

Don’t stand near a printer while it is working

Don’t use lots of fragrances or scented products on your body

**DO**

Read the labels on products that you use in school

Ask the teacher to ventilate the classroom if there is a strong “scented” smell after cleaning or if your eyes or throat feel itchy

Suggest that your family and friends use 100 percent natural scented products instead of air fresheners

Look for items marked “phthalate free” or “fragrance free” when you go shopping with your parents
Healthy air

Maintaining healthy indoor air at school and at home

- Don't smoke
- Clean and air rooms regularly, even in winter
- Grow plants that can help to reduce concentrations of harmful substances in the air indoors
- Limit the use of chemicals indoors, and store any necessary chemicals in a safe place
- If you are renewing flooring, replace wall-to-wall fixed carpets made of artificial materials with coverings made of natural fibres
What is the atmosphere?

The atmosphere:

- holds down the temperature on the surface of the Earth, which makes it possible for living organisms to exist;
- determines the climate of the Earth;
- filters many of the ultraviolet rays of the sun, which are harmful to people, plants and animals;
- dissipates the smoke and noxious gases released as a result of natural processes and human activities;
- serves as a reservoir of the various gases that sustain life;
- plays a major role in the natural water cycle;
- transmits sound waves, which makes hearing possible; and
- is the medium in which various smells and flavours spread, which is important for the pollination of plants and the orientation of animals.

Plants and animals depend on the gases in the atmosphere. Plants need carbon dioxide for photosynthesis. Oxygen is released as a product of photosynthesis, and this oxygen is taken in by animals and human beings, who then exhale carbon dioxide.
What is the greenhouse effect?

There has always been a natural greenhouse effect, which keeps the Earth warmer than it would be without an atmosphere, making life on Earth possible.

Energy from the sun reaches the Earth and warms it. The Earth reflects this energy back, at the same time changing it to infrared energy (heat). Due to gases in the atmosphere that envelops the Earth like a blanket, part of this reflected energy is trapped and never leaves the Earth. Thus, in contrast to other planets without an atmosphere, the Earth stays warm.

Before the Industrial Revolution, which started in the middle of the 18th century, economies were mostly based on small-scale agriculture and commerce. Since then, advances in technology, the large-scale construction of factories, a colossal growth in manufacturing and the advent of large-scale mechanised agriculture have led to increased pollution and the production of greenhouse gases such as carbon dioxide, nitrogen oxides, Freon and methane, as well as water vapour.

The increased concentration of greenhouse gases has led to an increase in the amount of trapped solar energy, thereby raising the temperature of the Earth’s atmosphere. The latest scientific insights and research confirm that global climate change is taking place, and it is projected to continue.

Most greenhouse gases, such as carbon dioxide, nitrogen oxides and methane, occur naturally.

Methane

Emitted during the production and transport of coal, natural gas and oil, methane is also produced by livestock farming and the decomposition of organic waste in municipal solid waste landfills. Methane is 20 times more effective in trapping heat than carbon dioxide and thus contributes 20 times more to the greenhouse effect.
**Carbon dioxide**

Over millions of years, trillions of tonnes of carbon were removed from the atmosphere by plants and trapped in sediments that eventually became deposits of coal, oil and natural gas. For the past two centuries, humans have been extracting and igniting these fossil fuel resources at an increasing rate. Today, human beings release about 5.5 billion tonnes of carbon into the atmosphere every year by burning fossil fuels. Another 1.5 billion tonnes per year are released through land-use changes, such as deforestation. When trees are cut, they stop absorbing carbon. If the trees are then burned, the carbon is immediately released back into the atmosphere. These releases result in an increase in atmospheric carbon dioxide of about 0.5 percent per year. Since the Industrial Revolution, the concentration of atmospheric carbon dioxide has increased by 30 percent. The use of fossil fuels for energy production and transport is the leading source of global carbon dioxide emissions.

**Nitrogen oxides**

Emissions of these gases are caused mainly by agricultural activities and the burning of vegetation and forests.
Emissions from vehicles

The negative impacts of motor vehicle transport on the environment are obvious. Internal combustion engines burn huge amounts of oil products, releasing various hazardous substances into the air.

**Carbon monoxide**
This extremely toxic gas poses a risk to the environment and to human beings. Carbon monoxide affects the cortex of the human brain, causing damage to the nervous system.

**Solid particles**
If inhaled, these particles penetrate the lungs and remain there permanently, causing respiratory diseases. They also damage water reservoirs and plant growth.

**Nitrogen oxides**
In contact with moist surfaces such as the lining of the respiratory tract, nitrogen oxides form nitric acid that can damage the respiratory system.
Sulphur dioxide
This highly toxic substance is harmful to all warm-blooded creatures. In humans it can cause kidney failure, heart failure and cardiovascular impairment.

Sulphur dioxide corrodes metal objects and can destroy building structures.

Hydrogen sulphide
This toxic gas causes neurodevelopmental disorders and damages the cardiovascular and respiratory systems.

Aromatic hydrocarbons
Emitted into the atmosphere as a result of the incomplete combustion of fuel and from fumes from engines and petrol stations, these toxic elements can have serious harmful effects on the human body.

Benzopyrene
This carcinogen causes human cells to mutate.

Formaldehyde
This is a highly toxic substance that can cause cancer.
What difference does it make if you turn the lights off in the classroom when you leave the room empty?

The production and consumption of electrical power result in an extraordinary amount of pollution. The burning of fossil fuels is accompanied by discharges of acidic gases, dust, soot and other pollutants. Between 15 and 20 percent of the energy produced is used for lighting. If every class turned off a light for one hour it would lead to significant energy savings. This in turn would mean less pollution of the environment, and would save the school money.

The same is true at home:

Assume there are 1 million families in your region.

Imagine that each family turns off one lamp with a 100 watt bulb for one hour.

This will save 100,000 kilowatt-hours (kWh) of energy and EUR 10,000 (if the price for kWh is EUR 0.1).

This saving would be sufficient to allow a small-sized power plant to stop working for one hour, and to stop polluting the environment for this time.
How to save energy while lighting

You won’t be able to make all these changes, but it’s good to know what makes a difference!

Decorate the walls in light colours (saves 2 percent of the energy needed for lighting).

Plant trees at least 5 metres away from buildings.

Always keep windows clean (saves up to 1 percent energy).

Turn off lights when they’re not needed: timers and movement sensors can control outside lights so that they’re only on when necessary.

Replace incandescent bulbs with compact fluorescent lamps, which last up to 10 times longer. Although they are more expensive, if you replace a 75 watt bulb with a 20 watt fluorescent bulb at 10 hours of work per day, you will recover your investment within a year.