



## What's in the Air?

Earth's atmosphere contains about 78% nitrogen gas and 21% oxygen gas. The remaining 1% contains many different trace gases.

Earth's atmosphere has changed greatly since Earth formed more than four billion years ago. The level of oxygen gas in the air today is believed to be higher than levels billions of years ago. Scientists believe oxygen levels rose when a living organism called cyanobacteria (formerly known as blue-green algae) evolved more than three billion years ago. Cyanobacteria carries out a chemical reaction that uses sunlight to convert carbon dioxide and water into glucose and **oxygen**. This chemical reaction is called photosynthesis.

The remaining 1% of trace gases includes carbon dioxide, water vapour, neon, helium, methane, krypton, carbon monoxide, sulfur dioxide, hydrogen, ozone, xenon, nitrogen dioxide, radon, nitrogen dioxide, nitrous oxide and nitric oxide, etc. The different 'nitro' gases are part of the nitrogen cycle, and help to recycle nitrogen from decomposing plants and animals so it can be used again to build proteins in living things.

Although many gases in Earth's atmosphere are found in small amounts, they can still have a powerful effect on the Earth's surface. For example, ozone is very important for preventing too much ultraviolet radiation from reaching Earth's surface. Carbon dioxide and methane help to keep the Earth warm enough for Life to thrive. If levels of carbon dioxide, methane and water vapour become too high, Earth may become overheated.

### More Information

Earth's Atmosphere (NASA) <http://liftoff.msfc.nasa.gov/academy/space/atmosphere.html>

Where did Earth's oxygen come from?

[http://www.sciam.com/print\\_version.cfm?articleID=000E9FDF-CBC1-1C71-9EB7809EC588F2D7](http://www.sciam.com/print_version.cfm?articleID=000E9FDF-CBC1-1C71-9EB7809EC588F2D7)

Scientific American                      News                      6 August 2001.

New Theory Explains How Earth's Early Atmosphere Became Oxygen-Rich.

[http://www.sciam.com/print\\_version.cfm?articleID=000304B7-4A8F-1C60-B882809EC588ED9F](http://www.sciam.com/print_version.cfm?articleID=000304B7-4A8F-1C60-B882809EC588ED9F)

New Scientist                              The Last Word

Did all the oxygen in Earth's atmosphere come from photosynthesising plants? If not, where did it come from?

<http://www.newscientist.com/lastword/article.jsp?id=lw969>

Why is Nitrogen the most common element in the Earth's atmosphere?

<http://www.soest.hawaii.edu/GG/ASK/atmo-nitrogen.html>

Scientific American                      Ask the Experts                      21 October, 1999.

When did eukaryotic cells (cells with nuclei and other internal organelles) first evolve? What do we know about how they evolved from earlier life-forms?

[http://www.sciam.com/print\\_version.cfm?articleID=000C32DD-60E1-1C72-9EB7809EC588F2D7](http://www.sciam.com/print_version.cfm?articleID=000C32DD-60E1-1C72-9EB7809EC588F2D7)