



## Ozone

Ozone is a gas mostly found 15 to 30 kilometres above the Earth's surface in the stratosphere. Some ozone is found at ground level as well.

Ozone molecules are made of three oxygen atoms joined together. The oxygen gas we breathe has two oxygen atoms joined together. Unlike normal oxygen, ozone is blue, has a strong odour and is harmful to breathe in large amounts.

Ozone is important in the stratosphere because it absorbs some ultraviolet (UV) radiation from the Sun before it reaches Earth's surface. Some UV is needed by living things, but too much UV radiation can damage skin (causing cancer), eyes (causing cataracts) and animal immune systems. High UV levels also damages crops.

Over the last 50 years Earth's whole ozone layer has thinned. The ozone layer becomes especially thin over Antarctica during summer. This has become known as the ozone hole, although the whole ozone layer is actually becoming thinner, rather than developing a gaping hole in one area.

The main reason for ozone layer depletion is the use of chemicals that contain chlorine atoms such as chlorofluorocarbons (CFCs) and other halons (such as bromine). When CFCs reach the stratosphere, UV radiation breaks them apart to release free radicals (such as chlorine atoms). These free radicals destroy ozone molecules, and the ozone layer is gradually destroyed. Because compounds like CFCs take a long time to break down it will be at least 50 years before the ozone layer is restored.

People often get confused between the ozone hole and the greenhouse effect. Although ozone is a greenhouse gas (similar to carbon dioxide), the ozone hole (allowing more UV radiation through than usual) is different to the greenhouse effect (temperatures on Earth increasing due to higher carbon dioxide, methane and water vapour levels).

### More Information

Ozone Depletion: Myth v Measurement <http://www.epa.gov/ozone/science/myths.html>

Ozone Information, Bureau of Meteorology  
[http://www.bom.gov.au/lam/Students\\_Teachers/ozanim/ozoanim.shtml](http://www.bom.gov.au/lam/Students_Teachers/ozanim/ozoanim.shtml)

NASA Ozone information <http://www.nas.nasa.gov/About/Education/Ozone/ozone.html>

The Australian Greenhouse Office. The difference between the greenhouse effect and ozone depletion.  
<http://www.greenhouse.gov.au/education/what.html#ozone>

Misconceptions in Australian Students' Understanding of Ozone Depletion  
[http://www.met.sjsu.edu/~cordero/research/Papers/MSIE\\_paper.pdf](http://www.met.sjsu.edu/~cordero/research/Papers/MSIE_paper.pdf)

CSIRO Atmospheric Research <http://www.dar.csiro.au/information/ozone.html>

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Why do ozone-depleting chemicals not diffuse evenly (and cause a general thinning of the ozone layer) but instead cause holes at the poles?

[http://www.sciam.com/print\\_version.cfm?articleID=00069073-5163-1EFB-BA6A80A84189EEDF](http://www.sciam.com/print_version.cfm?articleID=00069073-5163-1EFB-BA6A80A84189EEDF)