Denver Children's Environmental Health Center

What is Ozone?

Ozone is a gas composed of three atoms of oxygen (O_3) one more than the oxygen our body uses for living. It is a colorless and odorless gas. Ozone occurs in the Earth's upper atmosphere and at ground level. Ozone can be good or bad, depending on where it's found. The focus of this article is bad ozone.

- **Good Ozone** occurs naturally above the Earth's surface, where it forms a protective layer that shields us from the sun's harmful ultraviolet (UV) rays.
- **Bad Ozone** or ground level ozone is formed when pollutants, such as nitrogen oxides (NOx) and volatile organic compounds (VOCs), are produced by:
  - cars
  - power plants
  - industrial boilers
  - refineries
  - paints or glues
  - chemical plants

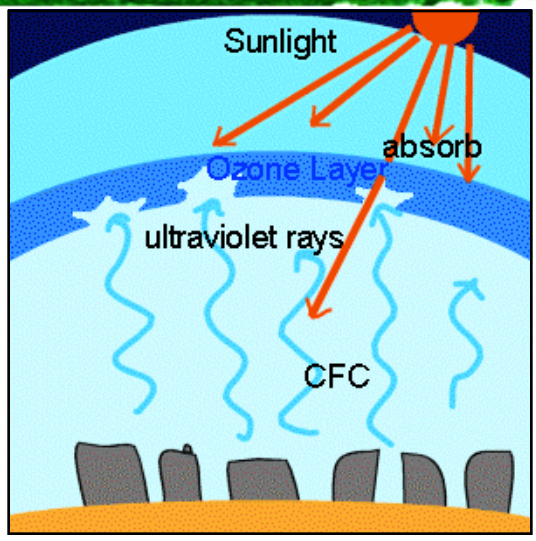
http://www.wmcac.org/airquality/lesson.html

Why be concerned about bad ozone?

Relatively low levels of ozone can be a strong irritant to the lungs, even in healthy people.

Ozone can cause:

- Difficulty breathing
- Chest pain
- Coughing
- Sore or scratchy throat
- Inflammation and damage to the lungs
- Worsening of lung conditions like asthma or COPD



http://www.differencebetween.info/difference-between-ozone-and-greenhouse-gases

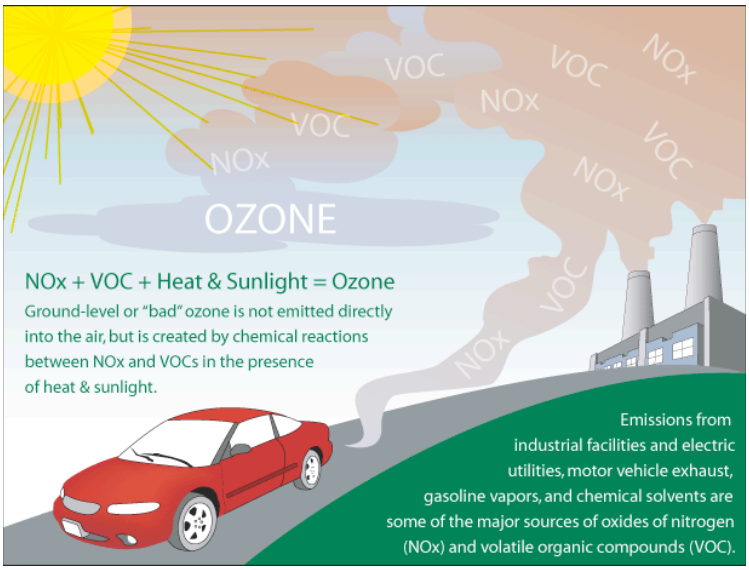
Ozone is likely to reach unhealthy levels on hot, sunny days in big cities.

What is the AQI?

The **Air Quality Index** (AQI) is a report of air quality. It tells you how clean or polluted your air is, and the possible health effects from breathing dirty air. The higher the AQI value, the greater the level of pollution in the air.

Category, Color & Range	What does this mean?	Precautions to take
Good 0-50	Air quality is good.	None: Everyone enjoy outdoor activities.
Moderate 51-100	Air quality is a concern for people who are extra sensitive to air pollution.	People extra sensitive to air pollution: Plan strenuous outdoor activities when air quality is better.
Unhealthy for Sensitive Groups 101-150	Air quality is unhealthy for many people including active adults, people with lung disease (including asthma), older adults and children.	Sensitive groups: Cut back or reschedule strenuous outdoor activities.
Unhealthy 151-200	Air quality is unhealthy for everyone, especially people with heart or lung disease.	Everyone: Avoid strenuous outdoor activities.
Very Unhealthy 201-300	Air quality is unhealthy for everyone, especially people with heart or lung disease.	Everyone: Avoid physical outdoor activities.
Hazardous 301-500	Air quality is hazardous for everyone.	Everyone: Avoid all outdoor activities.

http://illinois.enviroflash.info



http://airnow.gov/index.cfm?action=aqibasics.ozone

Who is most at risk from exposure to ozone?

People with lung disease such as asthma, bronchitis, COPD, and emphysema are more likely to have serious health effects from ozone, even low levels of ozone because it causes the lining of the lungs to become inflamed and irritated. Talk with your health provider about what to do on high ozone days.

Children are at higher risk of ozone exposure because they:

- spend more time outdoors on warm, sunny days
- have smaller lungs and breathe more often than adults so their exposure is greater

Older adults are more affected by ozone exposure because they are more likely to have underlying heart or lung disease.

Active people of all ages who exercise or work outdoors are at high risk because they have higher exposure levels.

Take action to reduce your exposure to ozone:

- **Decrease time spent outdoors during the afternoon and early evening. These are times when ozone levels are highest.**
- **Reduce physical activity levels (walking instead of running) or avoid outdoor exercise during high pollution days.**
- **When air quality is good, walk or bike instead of driving.**
- **When driving, limit idling and combine errands to reduce travel.**
- **Use environmentally safe paints and cleaning products whenever possible.**
- **Fill up your gas tank in the early morning or after dark.**
- **Pay attention to the AQI to know if ozone levels are high. The AQI can be found at www.airnow.gov.**

Resources:

1. Allen, Jeannie. *The Ozone We Breathe.* April 19, 2002. http://earthobservatory.nasa.gov/Features/OzoneWeBreathe/
2. EPA. Ozone. http://www.epa.gov/airquality/ozonepollution/health.html
3. Minnesota Department of Health. *Air Quality: Ozone*. http://www.health.state.mn.us/divs/eh/air/ozone.htm

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REGIONAL AIR QUALITY COUNCIL
National Jewish Health

The Denver Children's Environmental Health Center promotes collaboration among researchers and communities. Together they advance our understanding of the environment and how it affects our health.

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