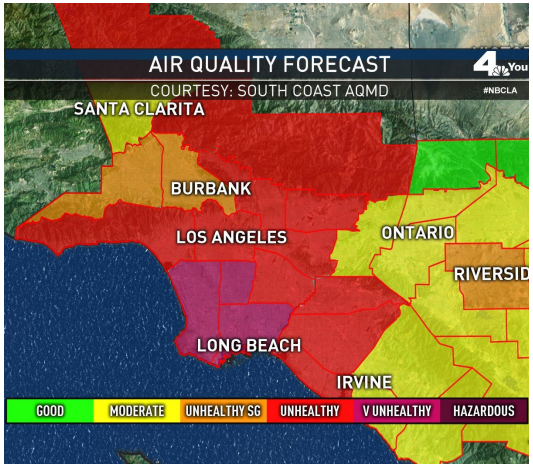
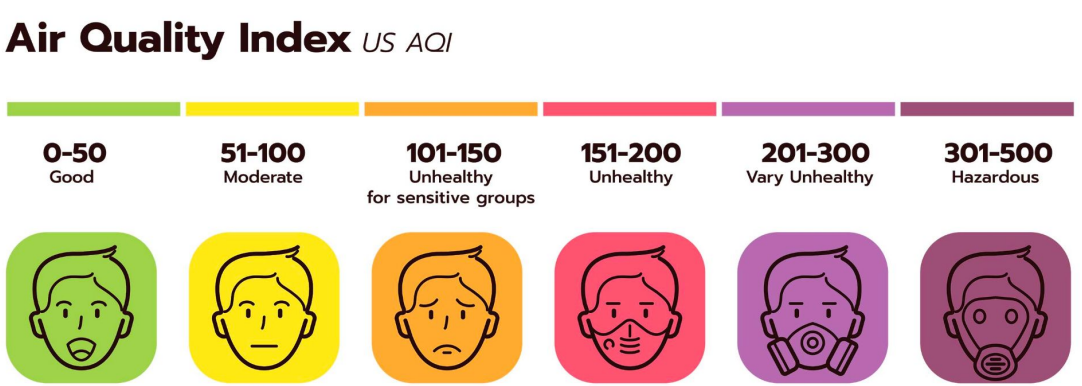

What is
Air Quality

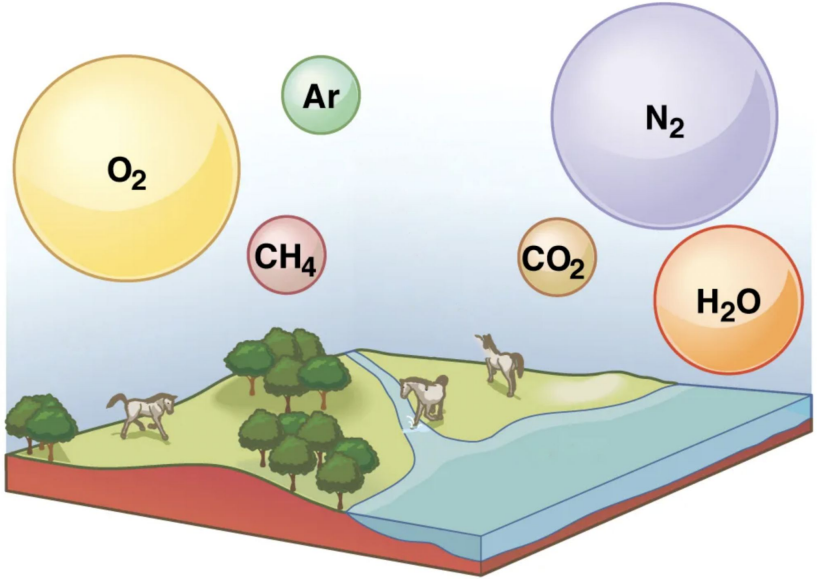
Air Quality is a measure of how clean or polluted the air is. Monitoring air quality is important because polluted air can be bad for our health—and the health of the environment. Pollution can come from natural causes, such as wildfires, but primarily is created through human activity and industry.

Air quality is measured with the **Air Quality Index**, or AQI. It is used to communicate to the public how polluted the air currently is or how polluted it is forecast to become.

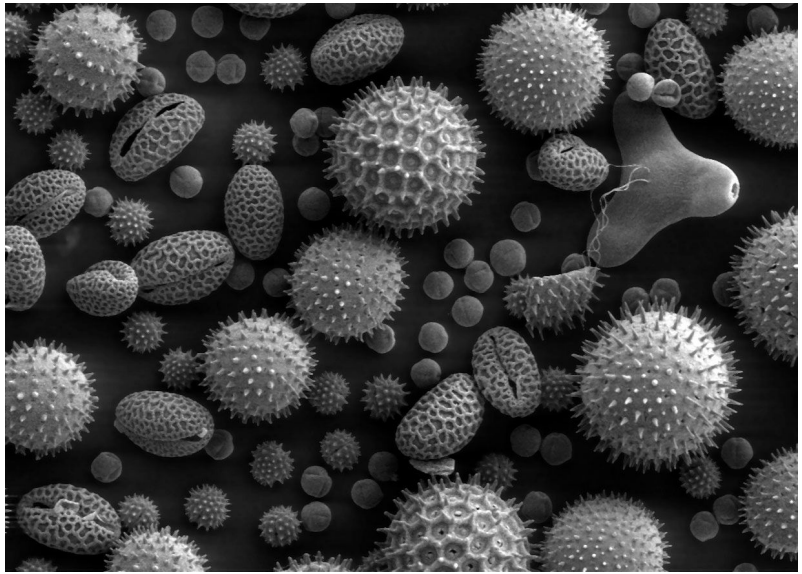




The air around us is made up of many different **gas chemicals**, primarily nitrogen, oxygen, argon, carbon dioxide and water vapor. The air also has **tiny particles** such as dust and pollen. Pollution is the introduction of gases and particles that are unnatural and harmful. There are two air pollutants that scientists focus on, Fine Particulate Matter ($PM_{2.5}$) and Ozone (0^3).

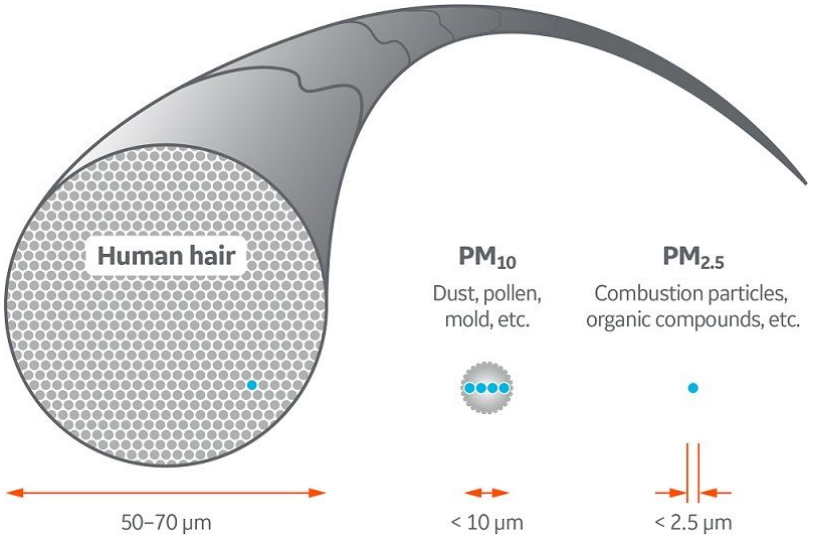


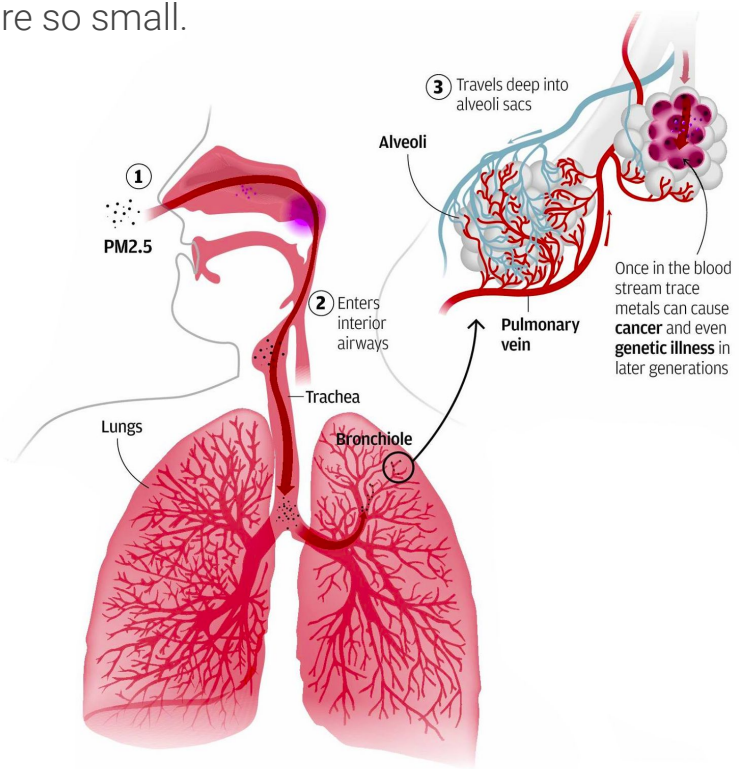
Oxygen, Methane, Argon, Carbon Dioxide, Nitrogen, Water



Plant pollen grains under a scanning electron microscope

Fine Particulate Matter ($PM_{2.5}$) are tiny particles or droplets in the air that are 2.5 microns or less in width. $PM_{2.5}$ are able to travel deeply into the lungs and penetrate into the bloodstream causing health problems because they are so small.



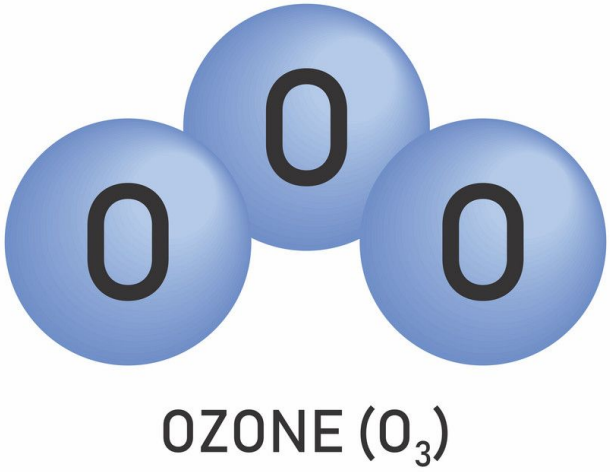


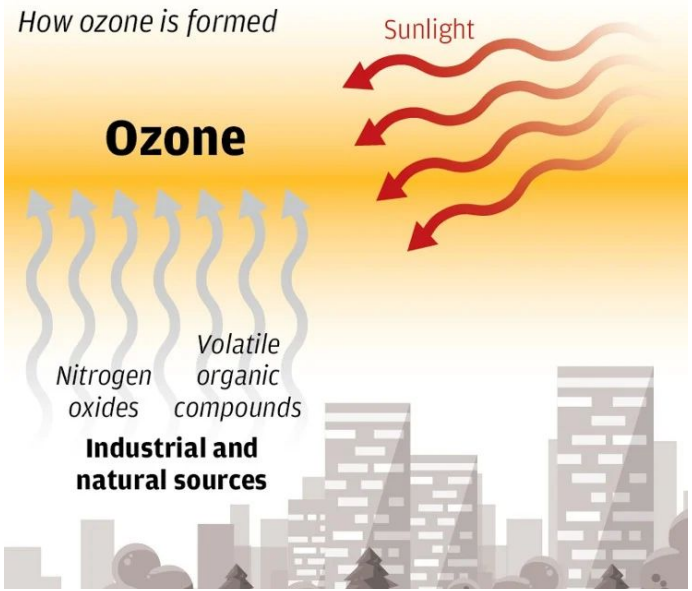
Fine Particulate Matter ($PM_{2.5}$) can be a problem outdoors and indoors. They can cause short-term, noticeable effects such as eye irritation or coughing. They can also cause long-term, compounding effects such as **asthma**, **cancer**, **heart disease**, and **birth defects**.

Outdoor Causes of $PM_{2.5}$

Indoor Causes of $PM_{2.5}$

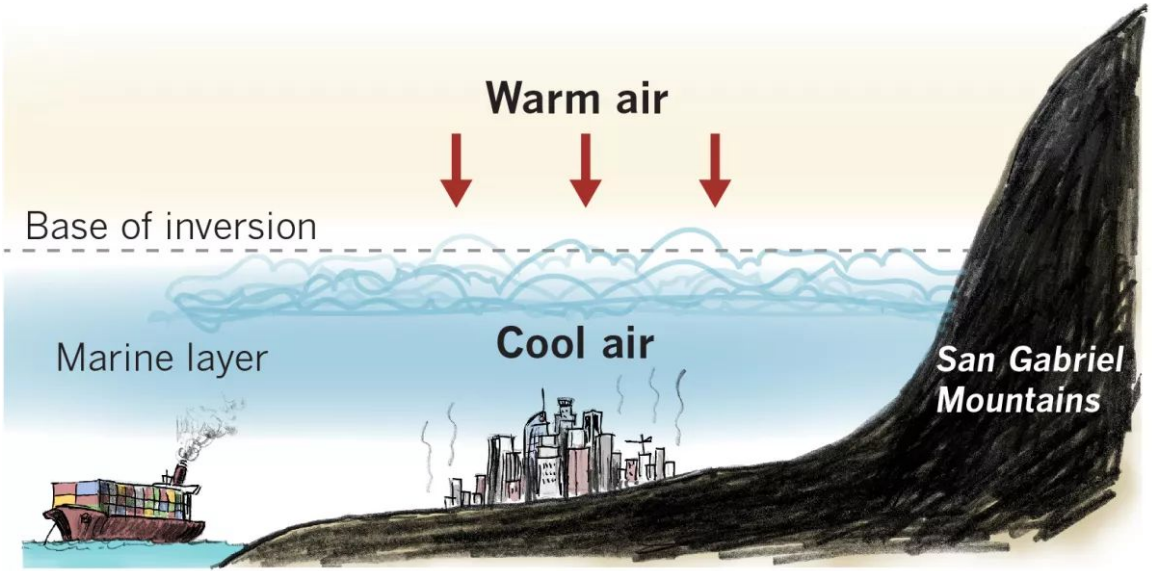
Ozone (O_3) is a gas molecule composed of three oxygen atoms. Ozone is formed when heat and sunlight cause chemical reactions between oxides of nitrogen (NO_x) emitted by cars and trucks and Volatile Organic Compounds (VOC), which are also known as Hydrocarbons. This reaction can occur both near the ground and high in the atmosphere.





Ground Level Ozone (O_3) often called "smog," is harmful to breathe. Ozone can damage the lungs, cause chest pain, coughing, shortness of breath and throat irritation.

Los Angeles pollution is some of the worst in the nation because frequent sunny days and low rainfall contribute to ozone formation, as well as high levels of fine particles and dust. The geography of Los angeles also traps pollution in the city for days.



A shallow marine inversion keeps pollution trapped in the L.A. Basin for days like a lid on a pot.

Have you ever noticed either good or bad air quality?

Where were you? What factors were impacting the air quality?