



OVERVIEW

BIG IDEA

The quality of the air we breathe affects our lung and respiratory health and ultimately our overall health.

OBJECTIVE

10.3: Explain how air quality impacts health.

AGENDA

1. What's in the Air?
2. Caretakers of the Air
3. Ozone & Particle Pollution
4. State of the Air
5. What is the State of YOUR Air?

HOMEWORK

Reflect upon the results of the state of air quality in your zip code. Share this information with one other person, and come up with one way we can improve the air quality.

LESSON 10.3

Air Quality

SUMMARY:

This lesson will provide students with a more tangible understanding of how the air we breathe can be harmful to our health, by exploring the two key threats in our air: ozone & particle pollution. Students will begin by brainstorming what is in the air we breathe. Then they will discuss some challenging questions with a partner. Next they will read about ozone and particle pollution on the State of our Air (American Lung Association website) and take notes, as well as the current year's report. Finally, students will look up the air quality grades and statistics for their own zipcodes and examine possible ways the problem can be reduced through actions at the individual community, and national level.

STANDARDS:

22.A.5b: Evaluate the effectiveness of health promotion and illness prevention methods using data from actual situations (e.g., impact of worksite health promotion programs).




MODULE 10: ENVIRONMENTAL HEALTH LESSON 10.3

Air Quality

Obj. 10.3: Explain how air quality impacts health.

DO NOW What's in the Air We Breathe?

The average person takes in about 28,800 breaths per day! The quality of the air we breathe affects our lung and respiratory health and ultimately our overall health. When we breathe in poor quality air over time, we can develop or worsen chronic disease. **Brainstorm:** What makes up the air we breathe? What harmful gases or particles might be in the air we breathe? Write your ideas in and/or around the cloud below.



DISCUSS Caretakers of the Air

With a partner, discuss the following questions. Record your ideas.

1. Who is responsible for the air we breathe? What roles do individuals, communities, organizations, the government, companies, etc. have?
2. If you found out that your home and/or school were located in areas with dangerous levels of air pollution, what would you do?

DO NOW: For more information on what actually is in the air we breathe, visit:

<http://www.airlifeone.com/HEPA500air.html>

and read the section entitled, "So what is in the air we breathe?"

DISCUSS: Their answers to question #2 can be re-visited at the end of the lesson when they find out the actual air quality in their own zip code.

**Ozone & Particle Pollution**

Read the following introduction to air pollution from the American Lung Association's website. Then navigate to the site at <http://www.stateoftheair.org/2014/health-risks/> to complete the table below.

Two types of air pollution dominate in the U.S.: ozone and particle pollution.¹ These two pollutants threaten the health and the lives of millions of Americans. Thanks to the Clean Air Act, the U.S. has far less of both pollutants now than in the past. Still, more than 147.6 million people live in counties where monitors show unhealthy levels of one or both—meaning the air a family breathes could shorten life or cause lung cancer.

So what are **ozone** and **particle pollution**? (Take notes from the website in the table below!)

Ozone	Particle Pollution

**State of the Air**

Read the "Key Findings" from the State of the Air report by the American Lung Association. Navigate to <http://www.stateoftheair.org/2014/key-findings/> and click on the various subsections. Then answer the questions below:

How does our nation's air quality today compare to the air quality of our nation one decade ago?	
What is the state of ozone pollution in our nation?	
What is the state of particle pollution in our nation?	
What things do we need to do as a nation and as individuals to get healthier air?	

NEW INFO:

More excellent information on air quality can be found at:

<http://www.cdc.gov/air/default.htm>

READ:

Consider searching for a recent news article about air quality and sharing with students. One example, from April 2014:

<http://www.usatoday.com/story/news/nation/2014/04/30/nations-air-quality-worsens/8466889/>

**What is the State of Your Air?**

1. Go to <http://www.stateoftheair.org/>
2. Type in your zip code under "What is the State of Your Air?"
3. Answer the following:
 - a. What grade does your location get for Ozone? _____
 - b. What grade does your location get for 24-hr particle pollution? _____
 - c. What change in ozone and particle pollution has occurred in your area?
 - i. HIGH OZONE DAYS:
Change since _____(year): (____) fewer/more days per year
 - ii. PARTICLE POLLUTION - 24 HRS
Change since _____(year): (____) fewer/more days per year
 - iii. PARTICLE POLLUTION - ANNUAL
Change since _____(year): (____) $\mu\text{g}/\text{m}^3$

**Do You Know Your Types of Air Pollution?**

1. Define particle pollution. Explain how it impacts health.
2. Define ozone. Explain how it impacts health.

**Reflect Upon the State of Your Air**

- a. How is the air quality in your zip code? Did the results surprise you?
- b. Is it getting better or worse?
- c. What can you do to help improve the air quality?
- d. Share the results with a family member or friend. Explain what they can do to help. What was their reaction?

ASSESS: Be sure students click on "How is my grade calculated?" to read an explanation of how to interpret the results and the data report to see graphs depicting more data.

ASSESS:

1. Ozone (O_3) is a gas molecule composed of three oxygen atoms. Often called "smog," ozone is harmful to breathe. Ozone aggressively attacks lung tissue by reacting chemically with it.
2. *Particle pollution* refers to a mix of very tiny solid and liquid particles that are in the air we breathe. Particle pollution can be very dangerous to breathe. Breathing particle pollution may trigger illness, hospitalization and premature death, risks showing up in new studies that validate earlier research.

HOMEWORK:

The purpose of this homework assignment is to get students to reflect, share, and act upon the realities of air quality in their community.