

# What is Air? *How Living Things Use It*



## Target Grade Levels

First - Third

## Time

One hour

## Materials

- student-made pictures of bones, liver, heart, lungs, small intestine, large intestine, brain, kidneys, muscles, stomach or mouth
- thirty to forty ping-pong balls in two colors, one color representing clean air, one color representing pollution

## Knowledge and Skills (TEKS)

- Science:
  - Make wise choices in the conservation of resources;
  - Describe ways technology influences human capacity to modify the environment;
  - Give examples of scientific discoveries and technological innovations that have shaped the world;
- Math:
  - Represent as in a graphic organizer;
  - Summarize making charts; and
  - Produce visuals.

## Overview

This lesson will help students understand how the body uses air and is very helpful in teaching them to appreciate the necessity of clean air.

## Background Information

Toxic air pollutants are poisonous substances in the air that come from natural sources (for example, radon gas coming up from the ground) or from anthropogenic sources (for example, chemical compounds given off by automobile exhaust) and can harm the environment or your health. Inhaling (or breathing) toxic air pollutants can increase your chances of experiencing health problems. For example, inhaling the benzene fumes that are given off when you pump gas into your car can increase your chances of experiencing health effects that have been associated with exposure to benzene, such as leukemia.

Health risks, put simply, are a measure of the chance that you will experience health problems. Exposure to toxic air pollutants can increase your health risks. For example, if you live near a factory that releases cancer-causing chemicals and inhale contaminated air, your risk of getting cancer can increase. Breathing air toxic air pollutants could also increase your risk of noncancer effects such as emphysema or reproductive disorders.

## Procedure

### 1) Vocabulary

- |                      |            |
|----------------------|------------|
| a) respiratory tract | h) brain   |
| b) oxygen            | i) air     |
| c) bones             | j) liver   |
| d) lungs             | k) heart   |
| e) small intestine   | l) kidneys |
| f) large intestine   | m) muscles |
| g) anthropogenic     |            |

- n) stomach
- o) mouth
- p) pollution

## 2) Activities

- a) Students should be assigned as homework or in-class preparation prior to the activity the task of drawing life-sized internal organs needed for in-class activity. Each student should learn the basic definition for his or her internal organ.
- b) Have the class count the number of times they breathe per minute.
- c) Does each student breathe at the same rate? What would change their breathing rates?
- d) Can they figure out how many times they breathe in one day?
- e) Share the following information with the students:  
Oxygen is inhaled through the nose and mouth. It enters the lungs and is transported to other organs through the blood. Once used, leftover air, or waste air, moves back to the lungs so that it can be exhaled through the mouth.
- f) Review with students the sources and types of air pollution (smoke, ozone). The Air Pollution Gremlins poster included with this curriculum binder can act as a good visual. Start the simulation
  - i) Choose students to act as the body parts. They will tape a picture to their shirts. Provide a handful of balls to other students who will serve as inhalation and exhalation.
  - ii) To begin, “clean air” is handed to the mouth who then passes it on to the lungs. The lungs in turn, pass the air to the heart who keeps the ball before passing the rest to another organ who does the same. Eventually, all organs have air and the waste air is returned to be exhaled through the mouth.
  - iii) In the next part of the activity, pollution mixes with air. Students, taking air, must close their eyes when choosing the balls. In the end, we will see that polluted air has interfered with the delivery of clean air to the organs that need it.

## 3) Review

- a) Each organ should be reviewed in terms of function and why it needs clean air.
- b) Each organ should be reviewed in terms of what might happen to the body (how you might feel) if the organ couldn't work properly because it wasn't fueled by clean air.

## 4) Evaluation

- a) Students can be quizzed on organ function and the body's need for clean air.
- b) Students can be quizzed on what they can do to help keep the air clean.

5) Extension

- a) Write a story about a villain pollutant and its journey around the body doing damage.
- b) Research how pollutants might damage each organ (remember that not all pollutants enter the blood stream) and what happens if each organ doesn't function properly.

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Adapted from: "Ozone Action! Let's Clear the Air: Educational Activities Kindergarten-5th grade." West Michigan Clean Air Coalition. 2003. [www.wmcac.org/gradesk5.pdf](http://www.wmcac.org/gradesk5.pdf).

Background information adapted from: Environmental Protection Agency (EPA). [www.epa.gov/](http://www.epa.gov/)