

# Air Quality and Transportation



## Target Grade Levels

Second - Eight

## Time

Two class periods, one morning or afternoon data gathering session

## Materials

- notebook paper

## Knowledge and Skills (TEKS)

- Science:
  - Acquire data through the senses;
  - The student shall be given opportunities to observe properties and patterns of objects, organisms, and events in the environment, and explore the environment;
  - Classify, order, and sequence data;
  - The student shall be given opportunities to classify matter, forces, energy, organisms, actions, and events from the environment according to similarities and differences; and
  - The student shall be given opportunities to describe changes that occur to objects and organisms in the environment.
- Language Arts:
  - Communicate data and information in appropriate oral and written form.

## Overview

This experiment will help us to see that using carpools and other alternative means of transportation are necessary to lessen air pollution.

## Background Information

Air pollution is a problem in many areas. Air pollution is air that is dirty compared to its original state. Air pollution can be harmful to people, animals, plants, and structures. Vehicles produce a large percentage of air pollution. Vehicle exhaust contains nitrogen oxides and small traces of volatile organic compounds. These two types of pollution, on hot, sunny days with light winds, can produce ground-level ozone. Exposure to high levels of the air pollutant ozone can cause health problems. Ozone is a main component of smog. Another common pollutant, especially from car and diesel exhaust, is airborne particle pollution. Some examples are tiny particles of soil, ash, or emissions from some factories that can get into your lungs and cause health problems. In order to control air pollution and protect public health, the government has placed restrictions on how much of these pollutants can be released into the air. Four ways you can help reduce this pollution are to carpool, take the bus, or walk or ride a bike instead of driving.

## Procedure

### 1) Vocabulary

- |                    |                               |
|--------------------|-------------------------------|
| a) air             | d) volatile organic compounds |
| b) pollution       | e) ground-level ozone         |
| c) nitrogen oxides |                               |

### 2) Activities

- Make a chart of transportation types on a sheet that has been categorized as follows:
  - One passenger in car
  - Two passengers in car
  - Three or more passengers in car

- iv) walker
- v) bicycle rider
- vi) bus rider

Note: Students should not count driver in this situation, however, in a carpool to work, the driver would count. Discuss why.

- b) Have students go to the front of the school in the morning or afternoon when there is the most traffic.
- c) Have students tally the transportation types for fifteen minutes.
- d) Graph the outcomes of the experiment.
- e) Return to the classroom and have the students discuss their observations.
- f) Ask the students to discuss alternatives to driving alone.
- g) Ask the students how they get to school in the morning. Categorize responses, count, and have students create a bar graph showing different types of home-to-school transportation used by the class.
- h) Student can then discuss results and how they might overcome obstacles to help improve the use of alternative methods. Use [www.aacog.com/commutesolutions](http://www.aacog.com/commutesolutions) for additional research; it provides excellent information on SchoolPool and other resources for the home-to-school commute.

---

Adapted from: "Air Quality and Transportation" *Texas Commission on Environmental Quality*.  
[www.tnrcc.state.tx.us/air/monops/lessons/lesson\\_plans.html](http://www.tnrcc.state.tx.us/air/monops/lessons/lesson_plans.html).

Reference: Integrated Thematic Unit Scholastic

Acknowledgment: Teresa Ayala, University of Texas at El Paso TES Course, 1995