

Air Terms: The Flash Card Game

Purpose:

To learn important vocabulary terms regarding air quality.

Grade Level:

9-12

Essential Elements:

Environmental Essential Elements Across the Curriculum - 75.25 (3) Classify, order, and sequence data. The student shall be given opportunities to (B) classify matter, forces energy, organisms, actions, and events from the environment according to similarities and differences.

Objective:

Students will learn terms regarding air quality

Focus:

Show an aerosol can. Ask students how this can relate to them. Discuss how the can affects the air they breathe.

Materials:

- flash cards with air quality terms
- magazines
- typing paper
- art supplies

You can download the flash cards and print them out yourself. The cards were created in PageMaker, but are stored here in *Replica* format. To download the free Replica viewer, which will allow you to view and print the flash cards, select:

- [Mac Viewer \(binhexed\) \(185K\)](#)

- [PC Viewer \(zipped\) \(288K\)](#)

To download the flash cards file, select a set for Mac or PC:

- Mac Users - [binhexed air quality flash cards \(flash.hqx, 17K\)](#).
- PC Users - [zipped air quality flash cards \(flash.zip, 9K\)](#).

Background:

Air pollution is a problem in many of areas of the United States. It can damage trees, lakes and animals, and make people sick. It can also damage buildings and other structures. Air pollution also can cause haze, reducing visibility in national parks and sometimes interfere with aviation. The federal government regulates air pollution in order to protect human health and the environment. There are several words that are used when discussing the subject of air pollution.

Procedures:

1. Divide students into groups of five. The students will number off from one to five. This group will be the base team.
2. Next, ask all of the ones to sit together, the twos to sit together, the threes to sit together, and the fours to sit together, etc.
3. Give each group six quality terms on flash cards that will be placed in the middle of the table. (The list of terms and definitions are provided. A formatted set of terms and definitions ready for double-sided photocopying is available in this folder for those able to use the software provided to download and print the file.)
4. The students will decide who will be first to take the top card. The first student will read the term and then the definition of that word from the card. The group will look in magazines for pictures that represent the air quality term. Each member of the group must find a picture or draw a picture to share with the base team.
5. After all the groups have completed illustrating the terms, the students will return to their base team.
6. Beginning with student number one, each member of the group will share the illustrations.

7. Each group will then practice reading the terms and definitions.
8. Show the aerosol can again. Ask the students how many air quality terms relate to the can.

List of Air Quality Terms and Definitions

air pollution

the soiling of the atmosphere by contaminants to the point that may injure health, property, plant or animal life, or prevent the use and enjoyment of the outdoors.

ambient air

outdoor air

atmosphere

the whole mass of air surrounding the earth

benzene

a colorless, hazardous hydrocarbon emitted during gasoline storage and transfer and from refining processes

carbon dioxide

a colorless, odorless gas formed during breathing, combustion, and decaying that adds to the greenhouse effect

carbon monoxide

a colorless, odorless, poisonous gas produced when carbon-containing substances such as coal, oil, gasoline, wood, or natural gas do not burn completely

catalytic converter

an air pollution control device that uses a chemical reaction to reduce emissions from motor vehicles

chlorofluorocarbons (CFCs)

chemicals used as coolants in refrigerators and air conditioners that can harm the ozone layer in the upper atmosphere and add to the greenhouse effect

combustion

burning or the production of heat and light energy through a chemical process

contaminant

an element or pollutant that soils the air

dispersion

the process of breaking up high concentrations of air pollutants

emission

a discharge or release of pollutants into the air, such as from a smokestack or automobile engine

environment

the combination of all external conditions and influences relating to the life, development, and survival of all living things

fossil fuels

coal, oil, and natural gas formed from the remains of ancient plant and animal life

hydrocarbons

compounds found in fossil fuels, glues, paints, and solvents that can react with other pollutants to cause smog

hazardous air pollutant

a contaminant that may cause an increase in rates of death or serious illness

meteorology

a science that deals with the atmosphere, weather, and weather forecasting

nitrogen oxides

gases that form when nitrogen and oxygen in the atmosphere are burned with fossil fuels at high temperatures

ozone

a colorless gas that is formed when pollutants react with sunlight and that is a major part of smog

particulate matter

specks of solid or liquid matter, including dust, smoke, fumes, spray and mist

photochemical process

the chemical changes resulting in smog brought about by the energy of the sun acting on air pollutants

plume

the visible emission from a smokestack or chimney

pollution

impurities in air, water and land that create an unclean environment

respiratory

anything having to do with breathing and taking in oxygen and releasing carbon dioxide

smog

the ground level haze resulting from the sun's effect on air pollutants

smoke

the gaseous products and small carbon particles resulting from incomplete combustion

stomata

tiny openings on the underside of leaves through which a plant takes in carbon dioxide

stratosphere

the layer of air that extends from about 10 to 30 miles above the earth's surface

toxic

something that can be poisonous or deadly if it is eaten, touched, or inhaled in large enough amounts

volatile organic compounds

contaminants that can help form ozone near the ground and can be harmful to health

Extensions:

- Use any of the files with air quality information and data provided to undertake classroom activities using actual air quality data collected in Texas by the Texas Natural Resource Conservation Commission.
- Have students get in pairs to conduct a pair check for the air quality terms using the flash cards.

Reference:

Spencer Kagan: Cooperative Learning, 1992.

Acknowledgement:

Lea Land, Stephen F. Austin Universtiy Nacogdoches TES Course, 1994