The Clean Air Game

1. Start on a Green Space.
2. Take turns rolling die and moving game pieces. Read aloud and follow instructions on each space you land on. If you land on a pollutant space, add one of that pollutant to your score.
3. Record scores on a tally sheet.
4. The team or player with the lowest score (cleanest air) wins.


contaminated crops


brain damage


gasoline use


heart damage


dead aquatic life


less oxygen in blood


global warming


smog


reduced alertness


damaged forests


eye irritation


contaminated livestock


lung damage


volcanoes, forests


diesel engines

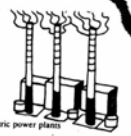

cars


dry cleaners


wood stoves


metal refineries


toxic cleaning solvents


electric power plants

PARTICULATE MATTER (PM)

Your diesel trucks need engine maintenance.

Add one PM and Toxic to your atmosphere.

You burn small, hot fires with seasoned wood in your woodstove.

Remove one PM and Toxic from your atmosphere.

Volcanoes, pollen, forest fires and trees add natural pollutants to the atmosphere.

Lose one turn.

SULFUR DIOXIDE (SO_2)

You have a coal-burning furnace.

Add one SO_2 to your atmosphere.

To reduce acid rain, your local power plant switches to low sulfur coal or oil and installs scrubbers to remove SO_2 from your smokestream.

Remove one SO_2 from your atmosphere.

You voice your concerns to your legislators.

Every player may remove one pollutant from their atmosphere.

OZONE (O_3)

Your family reduces their energy use.

BREATHE THE FRESH AIR AND TAKE ANOTHER TURN.

Every member of your family commutes to work alone each day.

Add one ozone to your atmosphere.

You have a headache from CO or toxic exposure.

Lose one turn.

You ride your bike to work each day instead of driving.

Remove one ozone from your atmosphere.

Start here

GREEN SPACE

You may remove any one pollutant.

You are careful not to let your car idle for very long.

Remove one CO, PM and VOC from your atmosphere.

You can't exercise today because high ozone levels make it difficult to breathe.

Lose one turn.

respiratory problems

Your woodburning stove gives off CO, PM and Toxics.

Add one of each to your atmosphere.

The Clean Air Act passes.

BREATHE THE FRESH AIR AND TAKE ANOTHER TURN.

CARBON MONOXIDE (CO)

Regional wind patterns carry pollutants long distances.

Take one pollutant from each category and add it to your atmosphere.

You buy a new car that uses an alternative fuel or is a low emissions vehicle.

Remove one O_3 and PM from your atmosphere.

You live near a metal refinery or have found lead paint and pipes in your home.

Add one Pb to your atmosphere.

LEAD (Pb) and HAZARDOUS AIR POLLUTANTS (HAPs or TOXICS)

Your sink cabinet and garage contain toxic cleaning solvents and other poisons which increase your risk of cancer.

Lose one turn.

You regularly have your car tuned up.

Remove one NOx and O_3 from your atmosphere.

Your local power plant burns coal.

Add one NOx to your atmosphere.

NITROGEN OXIDES and VOLATILE ORGANIC COMPOUNDS (NOx and VOC)

THE CLEAN AIR GAME

Source: Avalone-King, D. (Fall 2000). "The Clean Air Game: A quick introduction to air pollution – its sources, impacts, and solutions." *Green Teacher, 63*, pp. 23-25.

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When asked what are the essential factors for life, we usually answer food, water and shelter. Why do we forget about the air we breathe – that vital force that keeps us alive? We know the atmosphere exists, but we do not truly appreciate the essential role that it plays in the Earth's processes, from aerobic respiration in living things to the continuous cycling of elements such as water, carbon and minerals. Because human activities continue to disrupt the chemical balance of the atmosphere, there is a growing need to build a greater awareness of how to protect this precious resource.

The Earthminders' Clean Air Game is a great way to introduce a unit on air quality and to initiate a discussion of the importance of protecting the atmosphere. The objectives of the game are to acquaint students with sources and types of air pollutants, with the impact of air pollution on the health of people and the environment, and with actions individuals can take to prevent air pollution. The game can be used in a number of ways: in studies of energy use, it will spark discussion of how the choices we make create or ameliorate environmental problems; in ecology, it will highlight how non-living aspects of the environment change in response to human and other factors; and in science and technology, the game can be part of a unit on assessing the environmental impacts of technology and developing a personal sense of global stewardship. Regardless of where the Clean Air Game fits into your curriculum, it is a fun way to increase your students' awareness of the importance of protecting a resource that is vital to all of the Earth's systems.

Playing the Clean Air Game

The Clean Air Game can be played by students of all ages, from elementary school to high school. The suggested play time is 20 to 30 minutes for younger students and 10 to 15 minutes for older students. Additional time is needed for processing and sharing what is learned.

To play the game, students form teams of four or five. Each student has a playing piece and each team has a die. Players start on one of the two Green Spaces and move clockwise around the board. As players land on spaces, they read aloud the description and add or remove pollutants from their atmosphere as directed. When landing on pollutant spaces, players must add on of those pollutants to their atmosphere. (The purpose of these spaces is to familiarize students with the names and chemical abbreviations of pollutants.) Individual players may wish to keep track of their own scores, but the team score is what matters. The team with the lowest score (cleanest air) wins the game.

Scoring can be done on score sheets… For example, students may keep a general pollution score, with one column for adding pollutants and one column for removing pollutants, and sum it up at the end of the game. Or they may track each of the six pollutants on the board. As a follow-up, students may graph the results, analyse the data, and develop their own Clean Air Act with strategies for reducing each of the six types of air pollution.

Celebrate at the end of the game by rewarding the team that has the cleanest air (least points) with applause or, for fun, a jar of clean air! Have each group share examples of the actions or events that caused them to have dirtier air or cleaner air. This reflection is an important way to process the information and better relate the activity to their own lives and the actions they can take to reduce pollution.

The Clean Air Game was developed by Maine teacher Page Keeley from an activity in the *Environmental Resource Guide – Air Quality*, a curriculum resource for use in grades 6 to 8, produced by the Air and Waste Management Association. The guide is available in English, French or Spanish for US$33.50 plus s&h from A&WMA, (800) 275-5851 or (412) 741-1288.