



THE SIX INFAMOUS POLLUTANTS

INTRODUCTION

Students will work in groups to research and “get to know” the six major air pollutants. Students present information in creative ways to make an invisible and intangible entity (air pollution) a bit more visible and real to them through a “Meet the Pollutants” Press Conference. Students will use their imaginations to present their findings to fellow classmates. Students will also play a game, similar to tic-tac-toe, to reinforce knowledge of the six major pollutants. Students will discover ways to help reduce air pollution in their own lives.

LESSON OVERVIEW

Grade Level & Subject: Language Arts, English, Science; Grade 5

Length: 2 – 3 Class Periods

Objectives:

After completing this lesson, students will be able to:

- Identify and describe the six most common air pollutants
- Identify health and environmental problems caused by the six infamous pollutants
- Describe ways to reduce air pollution in their community
- Write an informative and factual article intended for a public audience

National Standards Addressed:¹

The following [Standards for the English Language Arts](#) come from the [National Council of Teachers of English](#):

- **Content Standard: [NL-ENG.K-12.5 COMMUNICATION STRATEGIES](#)**
 - Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.
- **Content Standard: [NL-ENG.K-12.12 APPLYING LANGUAGE SKILLS](#)**
 - Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

The following [National Science Education Standards](#) come from the [National Academies of Science](#):

- **Content Standard: [NS.9-12.6 PERSONAL AND SOCIAL PERSPECTIVES](#)**

As a result of their activities in grades 5-8, all students should develop understanding of:

 - Personal health
 - Populations, resources and environments

¹ <http://www.education-world.com/standards/>

- Environmental quality
- Natural hazards
- Science and technology in society

Materials Needed:

- Chart paper and marker
- **Reproducible #1 – Six Infamous Pollutants**
- **Reproducible #2 – Six Infamous Pollutants Assessment Rubric**
- **Reproducible #3 – Infamous Pollutant Biography**
- **Reproducible #4 – Infamous Pollutants Biography – Sample Student Answers**
- **Reproducible #5 – Meet the Pollutants Press Conference – Reporter's Notes**
- **Reproducible #6 – “O” Game Pieces and “O” Questions**
- **Reproducible #7 – “X” Game Pieces and “X” Questions**
- **Reproducible #8 – Tic-Tac-Toe Board**
- Game pieces
- Computers with Internet access and/or other air pollution reference materials
- A variety of art materials for presentation props (Students should also contribute)
- Cardstock, binder ring or other materials for binding the "Air Quality Journal"
- Newspaper clippings about air quality issues (optional)

Assessment:

Students will be assessed through the following activities:

- Completed research, using web sites and/or texts
- Completion of **Reproducible #3 – Infamous Pollutant Biography**
- Contributed to group presentation
- Recorded notes from press conference
- Participation in tic-tac-toe games
- Completion of article for *Air Quality Journal*

LESSON BACKGROUND

Relevant Vocabulary:

- **Air pollution:** Air pollution occurs when the air contains gases, dust, fumes or odor in harmful amounts. That is, amounts which could be harmful to the health or comfort of humans and animals or which could cause damage to plants and materials. The substances that cause air pollution are called pollutants. Pollutants that are pumped into our atmosphere and directly pollute the air are called primary pollutants. Primary pollutant examples include carbon monoxide from car exhausts and sulfur dioxide from the combustion of coal. Further pollution

can arise if primary pollutants in the atmosphere undergo chemical reactions. The resulting compounds are called secondary pollutants. Photochemical smog is an example of this.²

- **Air Quality:** A measurement of the pollutants in the air; a description of healthiness and safety of the atmosphere.³
- **Environmental Protection Agency (EPA):** An agency established in 1970 by the United States government to coordinate federal programs aimed at combating pollution and protecting the environment.⁴
- **U.S. Clean Air Act:** The Clean Air Act is the law that defines EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The last major change in the law, the Clean Air Act Amendments of 1990, was enacted by Congress in 1990. Legislation passed since then has made several minor changes.⁵

Background Information:

The **U.S. Clean Air Act** stipulates that the **Environmental Protection Agency (EPA)** set air quality standards for the six most common **air pollutants** that are found all over the nation. These include: Sulfur Dioxide, Carbon Monoxide, Ground-Level Ozone, Particulate Matter, Nitrogen Oxide and Lead. To help teach this lesson, here is a little more information on each of these pollutants. It is important to note that all of these pollutants occur naturally in the environment. However, they become harmful to public health and the environment when they are produced in large quantities that are contrary to a natural state.

Sulfur dioxide is a highly reactive gas. It is released naturally through volcanoes but the largest amounts of emissions come from fossil fuel combustion at power plants and other industrial facilities. In humans, sulfur dioxide affects the respiratory system causing difficulty in breathing, and even premature death. Sulfur dioxide is also particularly harmful for the environment, harming both plant and animal life. Sulfur dioxide contributes to acid rain.

Carbon Monoxide is a colorless, odorless and tasteless gas emitted from combustion processes. Although found naturally in the human body, in large quantities, it is extremely harmful to both animals and humans. The largest amounts of carbon monoxide come from cars, planes and other forms of transportation. By reducing the delivery of oxygen to the body's organs and tissues, high levels of carbon monoxide will effect the cardiovascular system and can even cause death.

Ozone is formed from the emissions of NO_x and VOC's, which occur naturally but are also emitted in the largest quantities from motor vehicle exhaust and industrial emissions. Ground-level ozone contributes to smog. Because sunlight and hot weather causes dangerous concentrations of ground-level ozone, summer is the most harmful season for this pollutant. Breathing ozone can cause chest

² "What is Air Pollution." *Environmental Protection Agency, Victoria*, Retrieved June 2, 2011 from <
<http://www.epa.vic.gov.au/air/aq4kids/pollution.asp>>.

³ "Air Quality" Entry. *Dictionary.com, LLC*. Retrieved April 5, 2011 from
<http://dictionary.reference.com/browse/air+quality>.

⁴ "Environmental Protection Agency Entry." Webster's Online Dictionary. Retrieved 2 June 2011 from
<http://www.websters-online-dictionary.org/definitions/EPA?cx=partner-pub-0939450753529744%3Av0qd01-rdlq&cof=FORID%3A9&ie=UTF-8&q=EPA&sa=Search#906>

⁵ "Clean Air Act." *U.S. Environmental Protection Agency*. Retrieved June 7, 2011 from <http://www.epa.gov/air/caa/>.

pain, coughing, throat irritation and congestion. It also worsens the effects of bronchitis, emphysema, and asthma.

Particulate Matter (PM) is composed of a variety of small particles and liquid droplets. It can be made up of both man made and natural particles, such as acids, metals, soil, dust particles, etc. Volcanoes, dust storms and forest fires are all responsible for particulate matter, as well as the burning of fossil fuels, power plants and industrial processes. Particulate Matter can be very hard for the respiratory system, especially for people with pre-existing conditions, including asthma and bronchitis. The fine particles in PM are so tiny that they can get deep into the lungs. PM can also cause an irregular heartbeat, difficulty in breathing and premature death.

Nitrogen Oxide is formed from car, truck, buses, and power plant emissions. Nitrogen Oxide also contributes to the formation of ground-level ozone and PM. NO_x, like many of the other air pollutants, affects the respiratory system. Even for healthy people, nitrogen oxide can cause airway inflammation. Nitrogen Oxide will also worsen the effects of pre-existing conditions, such as asthma and emphysema.

Lead is a metal found naturally in the environment. However, lead is also emitted into the air from fuels in motor vehicles and industrial sources. Lead can also be released into the air through ore and metals processing. Lead is particularly dangerous because it can leak into the food and water supply to be ingested by people. Lead-based paint that was historically used in houses is also a major exposure pathway for people. When lead enters the body, it is absorbed into the blood and bones. Lead can affect the nervous system, kidney function, and immune system, reproductive and developmental and cardiovascular systems. Lead also adversely affects the environment; it has been shown to cause loss of biodiversity, decreased growth and reproductive rates in plants and animals.

Although air pollution is a significant problem with no easy solution, there are some ways individuals can help. First of all, reducing the reliance on cars and trucks and using alternatives, such as public transportation and bikes will significantly reduce many of these pollutants. Also, writing letters to local and state governments to invest in cleaner energy alternatives will encourage the government to find ways to protect the air. Please check the EPA site for more information: <http://www.epa.gov/oaqps001/urbanair/>.

Resources:

- **What are the Six Common Air Pollutants?** *U.S. Environmental Protection Agency*
<http://www.epa.gov/oaqps001/urbanair/>
- **Cleaning up Commonly Found Air Pollutants** *U.S. Environmental Protection Agency*
<http://www.epa.gov/air/peg/cleanup.html>
- **Urban Air Pollution** *United Nations Environment Programme*
http://www.unep.org/urban_environment/issues/urban_air.asp
- **Today's AQI Forecast** *AIRNow*
<http://airnow.gov/>

LESSON STEPS

Teacher Preparation Steps:

1. Review all steps in this lesson prior to beginning.
2. Collect all items listed in the materials section, and make copies of hand-outs ahead of time. **Reproducible #5 – “O” Game Pieces and “O” Questions** and **Reproducible #7 – “X” Game Pieces and “X” Questions** should both be printed double sided and cut along the lines so the questions are on the back of the cards.
3. If students are playing the tic-tac-toe game in pairs, each pair will need:
 - a. **Reproducible #6 – “O” Game Pieces and “O” Questions**
 - b. **Reproducible #7 – “X” Game Pieces and “X” Questions**
 - c. **Reproducible #8 – Tic-Tac-Toe Board**
 - d. Game pieces (two different kinds to represent “X’s” and “O’s” – dimes and nickels, two different colored stones, etc.)
4. Each student will need 3 copies of **Reproducible #5 – Meet the Pollutants Press Conference – Reporter's Notes** to take notes on each of the 6 pollutants.

Warm-up: *The Air We Breathe*

1. Write the words “Air Quality” on the board and ask students the following questions:
 - a. What do the words Air Quality mean? *Air Quality is a measurement of the pollutants in the air; a description of healthiness and safety of the atmosphere.*
 - b. Is the quality of the air in their geographical area good or bad? Why? *Answers will vary but may include ideas about the amount of trees, cars, factories, people, fog, etc.*
 - c. What evidence is there of air pollution? *Answers will vary but may include ideas about fog or physical symptoms, such as coughing and shortness of breath..*
 - d. Have students ever experienced burning eyes or shortness of breath on polluted days? *Answers will vary.*
 - e. What time of the year does the air seem dirtiest? *This answer may vary according to region but in general, the air seems the dirtiest in summer because of higher particulate matter, higher humidity and less rain to wash everything away. There also tends to be more pollen in the air during the summer.*
2. Tell students that the issue of “air quality;” – how good or bad the air is - is often in the news across the country. (Show recent, related news articles if available.)
3. Ask students why there is so much talk about “air quality.”
4. Lead students in a short discussion about the importance of air for living things. Explain that bad air can contribute to a variety of illnesses such as asthma and cancer. Explain that even though air is so very important, and we should know what’s going in and out of our lungs, it’s sometimes hard to grasp because you usually can’t see it, hear, smell, touch, or taste air pollutants. It will be the students’ challenge to make invisible air and air pollutants visible and interesting to learn about.

Activity One: *Identifying Pollutants*

1. Ask students where air pollution comes from and as they answer, list their responses on the

board, under the title: "Sources of Air Pollution." *Cars, trucks, airplanes, power plants, big factories, fireplaces, and gas stations.*

2. Ask students to identify what air pollution is actually made of; if students can name any of the six major pollutants, applaud them for knowing what so many people don't know about the air they are breathing. *Ozone (O₃), Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO₂), Particulate Matter (PM), and Lead (Pb).*
3. Display **Reproducible #1 – Six Infamous Pollutants** on the projector or smart board for students to see.
4. Explain to students that there are more pollutants, but that these are the "biggies" and they should be infamous, but many people don't know anything about them. Tell them that it will be their job to find out to find out as much as they can about the pollutants and be able to share that information with others and make the pollutants "infamous."
5. Divide the class into six groups and assign each group one of the six infamous pollutants. **Distribute Reproducible #2 – Six Infamous Pollutants Assessment Rubric and Reproducible #3 – Infamous Pollutant Biography.**
6. Challenge students to treat the Pollutant as an infamous character about whom they are putting together a biographical sketch. Tell them to use the EPA [pollutants](#) and [air quality](#) websites for kids, listed on the hand-out, as well as encyclopedias or other resources, to answer the questions and get to know their Pollutant very well. Explain that groups will be preparing this biographical information for a "Meet the Pollutants" Press Conference in which each type of pollutant will be interviewed to find out what they are all about. (Explain that infamous people often hold press conferences and answer questions by reporters). Each person in the group will play a part of whichever pollutant that group was assigned; each person will speak at the press conference presentation and tell part of the pollutant's life story (based on information from **Reproducible #3 – Infamous Pollutant Biography**); and each person in a group should be prepared to answer questions from the "press."
7. The rest of the class will take notes and ask questions, acting as members of the press. Tell students that the groups may use props, special effects, or simple costumes to make the invisible pollutant visible and interesting to others. Mention that props also make good memory devices and help keep a presentation on track. Tell students that each group should have a main point or focus of its presentation, instead of just reciting a list of facts. For instance, a pollutant group could emphasize that their pollutant kills kids, or is the most dangerous, or had a difficult childhood, is not very threatening at all~ and explain how or why. A sample student presentation is included at the end of this document. Explain to students that for all activities in this lesson, they should follow the guidelines on the assessment rubric. At the end of the lesson, the teacher will collect the assessment rubric and grade accordingly. Be sure to mention that students should fill out the "Self-Assessment" portion of the rubric to get 5 extra points toward their overall grade presentations.
8. As students research and develop materials, circulate and assist them as needed. Encourage them to be creative yet scientifically accurate. Emphasize that each member of the group must participate in the presentation, and that each person must fill out his own version of the **Reproducible #3 – Infamous Pollutant Biography**, even if group members collaborate on the research. Allow time for the groups to plan and practice their presentations, after research is complete.

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9. After students have completed their research and prepared their presentations, set up the classroom for the press conference. Provide a central area for the presenters and an audience area for the rest of the students, who will be acting as reporters.
10. Distribute **Reproducible # 5 – Meet the Pollutants Press Conference – Reporter's Notepad**. Students will need *three* note pages each to have one section for each of the six pollutants.
11. Explain to students that the “reporters” will ask questions, but they must also take good notes: they will be using their notes later. Because students may not be familiar with a press conference format, the teacher will serve as moderator, introducing each Pollutant group, inviting the presentation to start, asking the first question, and guiding the audience to ask subsequent questions. You might want to add some humor by calling the Pollutants by names, such as Ms. CO (carbon monoxide), Mr. Pib (Lead), or Dr. Nox (nitrogen oxide). Allow each pollutant 5 – 10 minutes for their presentation and interview. After each session, be sure to applaud the presenters and briefly highlight the important points relating to the source of the pollutant, its effects on living things, and what can be done about it.
12. Congratulate the entire class on an exciting press conference and their ability to make invisible things that are hard to grasp much more visible and understandable.

Activity Two: *Air Quality Tic-Tac-Toe*

1. Tell students they are now going to play a game to go further in-depth into the Six Infamous Air Pollutants better. This Tic-Tac-Toe game is similar to the "Hollywood Squares" game on T.V.
2. Ask students to rearrange their desks so nine students are set up like a Tic-Tac-Toe board in the middle of the classroom with three rows of three. Assign each of these students one of the six Infamous Pollutant personalities listed above. One student is Ms. / Mr. Earth, one is Ms. / Mr. Dir. T. Air, and another is Dr. Haze. The remainder of the students should be divided into two teams, one Team X and the other Team O. A student or the teacher may serve as the Game Show Host who will ask the questions.
3. To start this game, a player from Team X chooses one of the “celebrities” to answer a question. The host reads a question from an X card (please see Teacher Preparation Step) and the celebrity answers, giving either a correct or an incorrect answer. The Team X player must decide if the answer given by the celebrity is correct or incorrect. If it is a correct answer, the Team X player wins the square and the host gives an X card to the celebrity to hold. This is repeated with the O team and continued until one team makes a Tic Tac Toe or the board is filled. OR If the class works better in smaller groups, divide the class into multiple teams of two students each. Give each team of two a copy of **Reproducible #8 – Tic-Tac-Toe Board, Reproducible #6 – “O” Game Pieces and “O” Questions, Reproducible #7 – “X” Game Pieces and “X” Questions** and Game Pieces. Have students cut out the questions and game pieces.
4. Tell students that the game is played like Tic-Tac-Toe except they must answer a question correctly before they can claim a space. The "X" player asks questions from the "X" Question cards. Similarly, the "O" player asks the "X" player questions off the "O" Question cards. A player can only place their piece on the Game Board card when a question is answered correctly.

Activity Three: *Alerting the Public*

1. Tell students that many people don't know much about these Infamous Pollutants and yet they are in contact with them often. Now that the students know the pollutants well, it's time they share this important knowledge with others. Assign students to choose three of the six major air pollutants and write an article for the "Air Quality Journal" using notes from **Reproducible #3 – Infamous Pollutant Biography** and **Reproducible #5 – Meet the Pollutants Press Conference – Reporter's Notes**. The article must be at least three paragraphs long, describing to the general public where the pollutants come from, how they are caused, their effects on living things, and what can be done about them. In addition to the information about each pollutant, the article must compare the three pollutants, pointing out similarities and differences, and must make a main point (such as which pollutant is the worst, which affects the most students in your community, or which presents a problem students have the power to help solve). The article will differ in point of view from the press conference presentations, which were conducted "in character." For purposes of this article, students should write as junior scientists. Please refer students to their copies of **Reproducible #2 – Assessment Rubric** for additional information on criteria for this assignment. The articles may be started in class and continued as a homework assignment.
2. After articles are submitted, bind the articles into a "magazine" and entitle it "Air Quality Journal." You may wish to add newspaper clippings and other pertinent information to the Journal as the class proceeds through the Air Quality unit. Please remind students that their Pollution Biography Worksheets and Reporter's Notepads should also be turned in, along with **Reproducible #2 – Six Infamous Pollutants Assessment Rubric**.

Wrap Up: *Discussion*

1. Begin a discussion with students.
 - a. What did you learn during these activities? *Answers will vary.*
 - b. Why is it important to be aware of air pollution? *Answers will vary.*
 - c. How can you make other people more aware of conditions of the air they breathe? *Answer will vary.*
 - d. What did you find were the best ways to improve air quality in your own community? *Answers will vary but make sure to mention the importance of education to students and making people aware of what causes air pollution.*

Extension: *Takin' it to the School!*

1. Students can work in teams to make posters, PSA's, songs, raps or skits about the importance of healthy air. Have students display their artwork or performance for other classes to raise awareness around the school.

Extension: *No Idling!*

1. Start a no idling campaign at your school or check out other No Idling resources from the [Earth Day Network archive](#).⁶

CONCLUSION

In this lesson students discovered the six most infamous air pollutants. They built their research and communications skills in order to present information to fellow students about one of the pollutants, listen to other students presentations and write an article intended for the general public and included in the Air Quality Journal. As a result of this lesson students can identify the most dangerous air pollutants and explain the problems they cause, as well as effectively convey their own opinions in several different forms of communication. Students also discussed tangible ideas for reducing the amount of air pollution in their own community.

LESSON PLAN CREDITS

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⁶ <http://www.earthday.org/noidling>

Six Infamous Pollutants

**Ozone (O₃)*

**Carbon Monoxide (CO)*

**Nitrogen Oxides (NO_x)*

**Sulfur Dioxide (SO₂)*

**Particulate Matter (PM)*

**Lead (Pb)*

Name: _____

Date: _____

Six Infamous Pollutants Assessment Rubric

Infamous Pollutant Biography

Criteria	Self-Assessment	Possible Points	Score
Conducted research using websites, books, texts - Researched using reliable Internet sites and outside resources		10	
Completed Infamous Pollutant Biography -Took notes that were useful in preparing for Pollutant Press Conference - Provided key information, including: <ol style="list-style-type: none"> 1. Identification and description of pollutant 2. Origins (Cause/where it comes from) 3. Location (Where and when usually found) 4. Effects (Problems, adverse impact) 5. Solutions (How humans can reduce this form of pollution and/or protect themselves from it. 		30	
Contributed to Group Presentation - Presented from the point of view of the pollutant - Showed individuality/personality (“in character”) - Engaged the audience (Eye contact, audience connection) - Used props and special effects to help audience remember the presentation - Appropriate amount/level of information used - Made a main point effectively/ Presentation had a focus (i.e. was your pollutant the worst or not really a threat? Does it have a special danger for kids?, etc.)		15	
Recorded notes from Press Conference (5 parts) - Kept notes on five pollutants (other than own)		15	
Wrote article for Air Quality Journal - Article written as for a science journal - Length appropriate (3 paragraph minimum) - Conveyed information content effectively - Identified causes and effects of 3 pollutants - Compared pollutants (similar/different) - Had a focus or main point (i.e. Which pollutant is worst, What the most effective thing people can do to fight pollution, how can people protect themselves from pollution effects, etc.)		30	
Bonus – completed self- assessment column		5	
Total		100+	

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Name of Pollutant: _____

- 1) What do you look like?
- 2) Where do you come from?
- 3) Where do you hang out?
- 4) What problems do you cause for humans and other living things?
- 5) What are humans doing to stop you from doing more harm?
- 6) What special effects, props or costumes will you use for the press conference?

Infamous Pollutant Biography – Sample Student Answers

Name of Pollutant: Nitrogen Oxides (Dr. Nox)

1) What do you look like?

There are actually lots of nitrogen oxides in my family. I am colorless and you can't smell me either. But there are some in my family that look kind of red-brown when they hang over cities. (Student might sprinkle red-brown dust to illustrate or show a picture with red-brown hanging over a city.)*

2) Where do you come from?

I come from things that burn fuel – like cars (Student might show picture of cars or tailpipes and/or make the sound of a car engine revving). I also come from factories (show a picture of smokestack) and from utilities like electric power plants (student might flash the classroom lights.)*

3) Where do you hang out?

I'm a traveler – I blow on the wind (student blows or waves a large cloth). I like to hang out over cities, but I can spread far and wide.

4) What problems do you cause for humans and other living things?

Lots! I can mix with other things called volatile compounds and heat and sunlight to make ozone and that can damage human lungs. (Student holds picture of lungs.) I can also mix with particles and cause problems to the lungs. I can mix with sulfur dioxide and make acid rain. (Sound of rain or picture of rain) That can make damage crops and fish and other things in the water.

I can also add extra nitrogen to the water and that messes up lakes and streams. (Hold up bottle of water or show picture of lake.)

Some of my family members work on global warming - -making the earth heat up. And that changes the whole climate everywhere (act out feeling very hot or show picture of global warming)

I can also mix with other things and make poison! (Show skull and cross bones.) And sometimes I make it hard for people to see things clearly because I block the sunlight (squint).

5) What are humans doing to stop you from doing more harm?

They made a law called the Clean Air Act to try to stop the factories and the electric companies from making so much of me. They're trying to make cleaner burning fuel for cars (quieter sound of engine revving). And some humans aren't driving cars as much – they ride buses, walk to places, or ride bikes. (Act out walking and biking). But right now, I'm still pretty powerful! (Show muscles.)

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Meet the Pollutants Press Conference – Reporter’s Notes

Pollutant Name: _____

What does it look like?

Where is it from?

Where does it hang out?

What problems does it cause?

What is being done about it?

Pollutant Name: _____

What does it look like?

Where is it from?

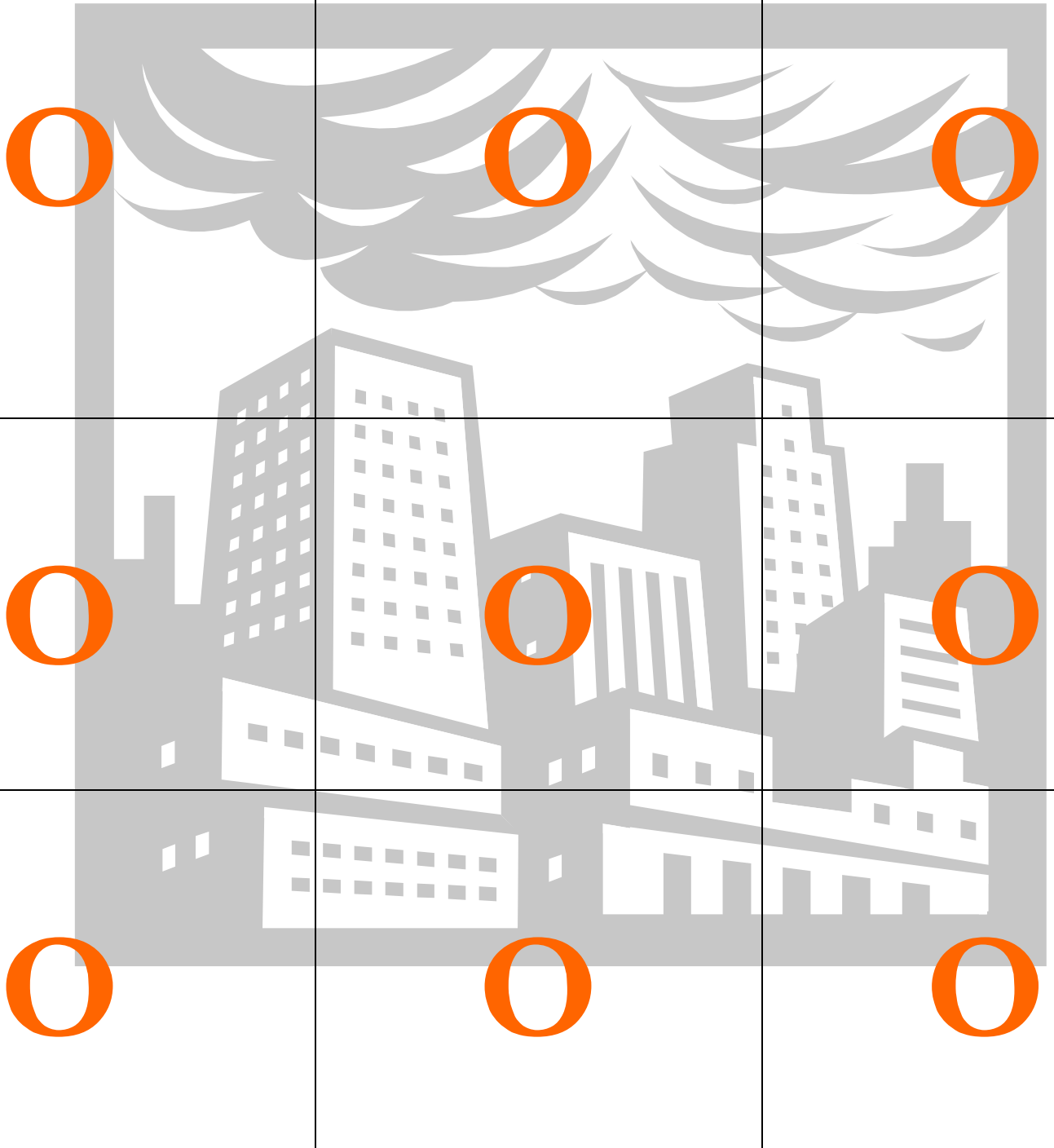
Where does it hang out?

What problems does it cause?

What is being done about it?

Six Infamous Air Pollutants

“O” Game Pieces



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Six Infamous Air Pollutants

“O” Questions

O Cards

_____ is a gas composed of three oxygen atoms.

Answer: Ozone (O₃).

O Cards

Name the four components that combine to produce ground-level ozone.

Answer: VOCs, NO_x, heat and sunlight.

O Cards

What are some sources of nitrogen oxides (NO_x)?

Answer: Motor vehicle exhaust, industrial emissions, gasoline vapor, chemical solvents.

O Cards

Name a colorless, odorless gas that is formed when carbon in fuel is not burned completely.

Answer: Carbon Monoxide.

O Cards

Describe how pollutants can contribute to health problems.

Answer: Can cause heart and lung problems, especially for the elderly, the young and those who have asthma, etc.

O Cards

What type of pollutant includes dust, dirt, soot, smoke and liquid droplets?

Answer: Particulate Matter.

O Cards

Name a metal found in the environment.

Answer: Lead.

O Cards

Ground-level ozone occurs mostly during what season?

Answer: Summer.

O Cards

Which pollutant comes mostly from electric plants that burn coal?

Answer: SO₂.

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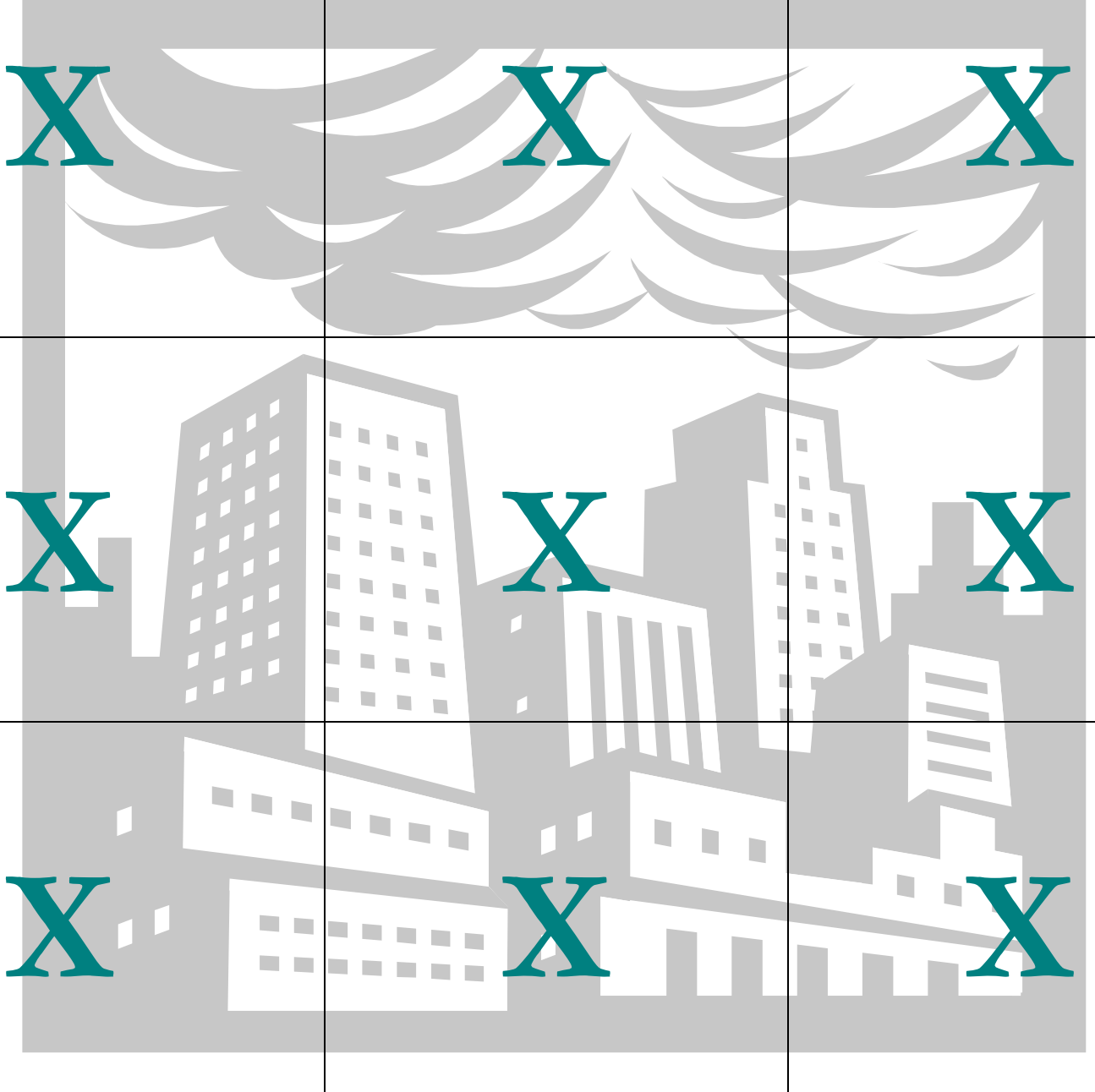
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Six Infamous Air Pollutants

“X” Game Pieces



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“X” Questions

X Cards

What type of pollutant includes microscopic particles and tiny droplets of liquid?

Answer: Particulate matter.

X Cards

During the summer in large urban areas like Atlanta, which pollutant causes the most air pollution?

Answer: Ground-level ozone.

X Cards

What is the major harmful ingredient in smog?

Answer: Ground-level ozone.

X Cards

What pollutants contribute to health problems?

Answer: All of them.

X Cards

What are the 6 major pollutants?

Answer: Ground-level ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter and lead.

X Cards

Name this pollutant: Larger types can be stopped in the nose and upper lungs by the body's natural defenses. Smaller types escape the body's defenses and go deep into the lungs where they may become trapped.

Answer: Particulate Matter

X Cards

Which pollutants can travel great distances on air currents?

Answer: Nitrogen oxides.

X Cards

Name three air pollutants that will be reduced if people drive less.

Answer: Ozone, carbon monoxide and nitrogen oxides.

X Cards

Which pollutant stops oxygen from getting to the body's organs?

Answer: Carbon monoxide

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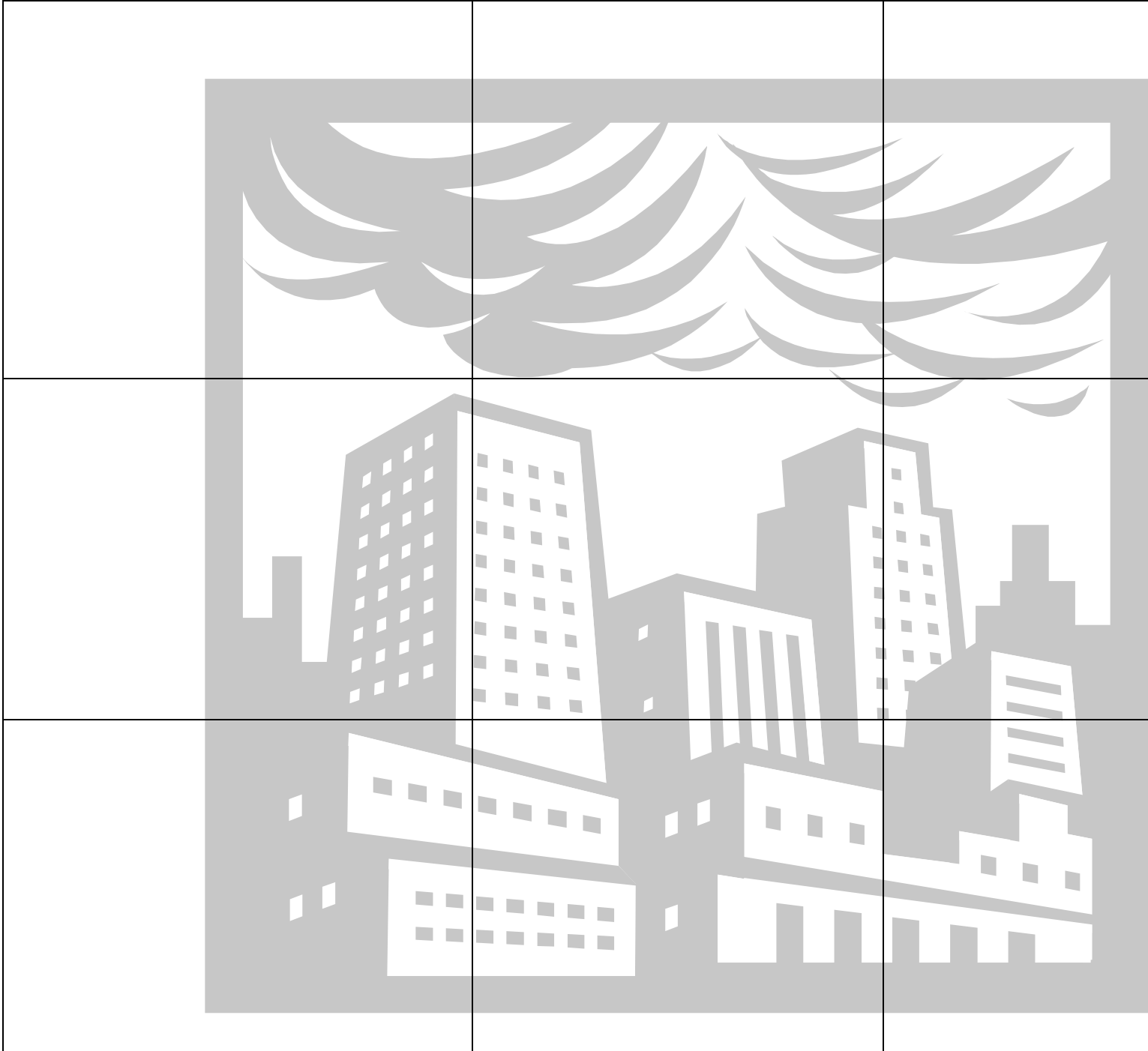
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Six Infamous Air Pollutants

Tic-Tac-Toe Board



Earth Day Network

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