



Please Do Not Make Us Cough, Turn Your Engine Off

By: The Clean Air Campaign, Inc. and Earth Day Network

INTRODUCTION

Using background information gathered from websites, students will complete a graphic organizer related to the six pollutants and how idling contributes to pollution. From the information, they will create a persuasive writing organizer. Students will write a 5 paragraph essay creating education and awareness about the harmful effects of idling and try to persuade others to stop idling.

LESSON OVERVIEW

Recommended Grade Level and Subject: Grades 3-5 Science

Length: 2 Class Periods

Objectives:

After completing this lesson, students will be able to:

- Identify the 6 major air pollutants.
- Understand how pollution impacts themselves and the world.
- Understand that some things can have a negative or positive effect on air quality.
- Create Persuasive Essays communicating the need to reduce idling to improve air quality.
- Communicate the information through publishing essays in the school newspaper, reading aloud on a school news show, and hanging work in the hallways.
- Encourage No-Idling.

National Standards Addressed¹:

• Content Standard: <u>NS.K-4.1 SCIENCE AS INQUIRY</u>

As a result of activities in grades K-4, all students should develop understanding of

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry
- Content Standard: <u>NS.K-4.6 PERSONAL AND SOCIAL PERSPECTIVES</u>

Earth Day Network 1616 P Street NW, Suite 340 • Washington, DC 20036 (P) 202-518-0044 • (F) 202-518-8794 www.earthday.net/education • education@earthday.net

¹ Education World (2008) *U.S. National Education Standards*. Retrieved February 5, 2009, from <u>http://www.education-world.com/standards/national/index.shtml</u>.

As a result of activities in grades K-4, all students should develop understanding of

- Personal health
- Characteristics and Changes in Populations
- Types of Resources

Levels 5-8

- Personal Health
- Populations, Resources, and Environments
- Natural Hazards
- Risks and Benefits
- Science and Technology in Society

Materials Needed:

- Computer and internet access or printed information from websites
- Reproducible #1 Graphic Organizer: Air Pollutants
- Reproducible #2 Persuasive Organizer
- Reproducible #3 Persuasive Essay: Student Directions
- Reproducible #4 Persuasive Essay: Rubric

Assessment:

- Participation in class discussion and group work
- Completion of **Reproducible #1 Graphic Organizer**
- Completion of **Reproducible #2 Persuasive Organizer**
- Persuasive Essays (See **Reproducible #4 Persuasive Essay: Rubric**)

LESSON BACKGROUND

Relevant Vocabulary:

- Air pollution: Substances in the air that have harmful or unpleasant effects.
- Idle or Idling: Inactive, not in use, not moving or in operation.
- **Smog:** A discolored haze that is a combination of airborne particles, gases, and chemicals (ground-level ozone) that together affect our health and our natural environment.

Resources:

http://www.epa.gov/air/urbanair http://www.epa.gov/airnow/aqikids/index.html http://www.cleanaircampaign.com/Kids-Schools/The-Clean-Air-Schools-Program/Program-Components/No-Idle-Program http://www.cleanaircampaign.com/Air-We-Breathe/The-Truth-About-Idling http://www.idlefreevt.org http://www.mass.gov/dep/air/community/schbusir.htm

> Earth Day Network 1616 P Street NW, Suite 340 • Washington, DC 20036 (P) 202-518-0044 • (F) 202-518-8794 www.earthday.net/education • education@earthday.net

LESSON STEPS

Warm-up: Idling Discussion

- 1. Ask students: What does idle mean? Solicit responses.
- 2. Have students run in place for 1 minute. Ask them if they traveled anywhere. Ask them if this was a waste of energy. If they were outside and needed to run a distance, would it make sense to run in place before they started traveling? Why would this idea be using a lot of energy wastefully?
- 3. Now, think about a vehicle. What does a vehicle do? Get you from place to place. Does it make sense to simply let your vehicle run in place without going anywhere? Why is it a bad idea? Why do you think people would do this? When people do this, they are idling. This is expending energy. In a vehicle this idling contributes to air pollution.
- 4. Have you noticed any cars idling at our school? Lead students to a discussion about the car rider lane. Is this good for us?? Could you use the power of your writing to inform others about the negative impact of their actions and try to influence them to stop idling?

Activity One: Researching Pollutants

- Divide students into groups of 3 or 4. Provide each student with Reproducible#1 Six Major Air Pollutants and assign each group one of the six air pollutants (Ozone, Carbon Monoxide, Nitrogen Oxide, Sulfur Dioxide, Particulate Matter, Lead).
- 2. Have each group research the causes and effects of each air pollutant at the following websites: <u>http://www.epa.gov/air/urbanair</u> and <u>http://www.epa.gov/airnow/aqikids/index.html</u>.
- 3. Students will share their findings with the class and compile information into one graphic organizer on the board. All students should add missing information to their own organizer.
- 4. As a class, discuss the information and talk about how reducing idling would reduce pollutants in the air.

Activity Two: Transferring to Persuasive Organizer

- 1. Pass out **Reproducible #2: Persuasive Organizer** to each student.
- 2. Let the students know that they will be writing a persuasive essay on why it is important to reduce how much we idle our cars. They will categorize facts into 3 reason categories such as health-related, environment and economic.
- Students should select 3 specific facts for each reason category. Allow them to answer these sheets using information gathered during activity one. Next, inform the students that they will use **Reproducible #2: Persuasive Organizer** to help them write a persuasive essay. Then pass out **Reproducible #3 Persuasive Essay:** Student Directions and explain the directions.
- 4. To follow the writing process you may have students complete a rough draft, edit, and revise. Refer to **Reproducible #4 Persuasive Essay: Rubric** to grade the essays.

Wrap Up: Discussion

Ask students the following questions:

- 1. What are the 6 major air pollutants?
- 2. How does idling contribute to air pollution?
- 3. Are graphs an effective way to communicate information about idling at our school?
- 4. Did you see trends and/or patterns when you analyzed the data?
- 5. How do you think education and awareness will reduce idling at our school?
- 6. What else can we do to promote "No Idling" at our school?

Extension: No Idling Campaign Toolkit

1. Students will extend the No Idling Campaign by obtaining a toolkit available from Earth Day Network, including signage and pledge cards: www.earthday.net/noidling

2. Students can artistically represent their message through creating a class mural to hang behind their writings.

3. Students could have a creative debate on why we should or should not idle.

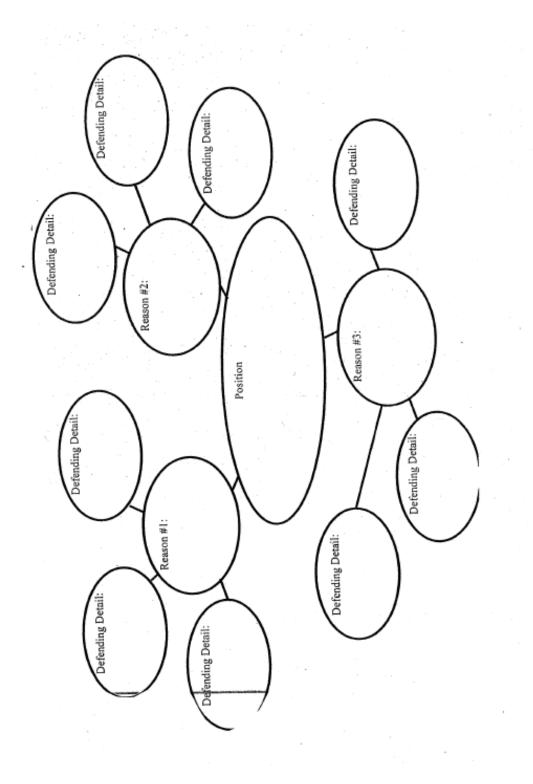
CONCLUSION

At the conclusion of this lesson, students will be able to communicate information about idling at your school and the impact of idling on air pollution and will begin a campaign of education and awareness at your school.

Six Major Air Pollutants

Pollutant	Causes	Effects
Ozone		
Carbon Monoxide		
Nitrogen Oxides		
Sulfur Dioxide		
Particulate Matter		

Lead	



Persuasive Organizer

Earth Day Network 1616 P Street NW, Suite 340 • Washington, DC 20036 (P) 202-518-0044 • (F) 202-518-8794 www.earthday.net/education • education@earthday.net

Student Directions: Persuasive Essay

- 1. Create a persuasive essay to convince the community to reduce idling.
- 2. The paper should have a clear title and introduction that lists your 3 primary reasons why drivers should not idle.
- 3. Your paper needs to have a body paragraph for each of the 3 primary reasons and they need to be filled with substantiating data.
- 4. Your paper should have a conclusion that reaffirms your position on no idling and summarizes the three reasons.
- 5. You paper should be easy to read and evidence of editing and revision should be present. You should strive for clarity in your writing.
- 6. Your paper should be organized with an introductory paragraph, 3 paragraphs, and a concluding paragraph.

Rubric

Persuasive Genre Attributes	4 Position clearly stated and provided 3 substantiated reasons to support their Position.	3 Position clearly stated, however, fewer or unsubstantiated reasons	2 Position not clearly stated, however, fewer or unsubstantiated reasons	1 Position not clearly stated and reasons are unsubstantiated.
Ideas	There is evidence of at least 3 individual cohesive, well articulated ideas to support the topic.	Ideas do support the topic,, however, there too few in number or not well articulated	Ideas may not be well articulated. They may be repetitive, however, they do support the topic.	Ideas are not well articulated or cohesive. Ideas do not support the topic.
Writing Conventions	Variety of sentence structure Does not interfere with readability Subject/verb agreement Spelling Capitalization/Punctuation	Variety of sentence structure Several mistakes that could interfere with readability. Subject/verb agreement Spelling Capitalization/punctuation	Limited Variety of sentence structure Mistakes do interfere with readability Subject/verb agreement Spelling Capitalization/punctuation	Variety of sentence structure No present Does significantly interfere. not interfere with readability Subject/verb agreement Spelling Capitalization/punctuation
Organization	Paper has complete introduction, at least 3 supporting body paragraphs and a complete conclusion.	Paper has all components, however, one is not complete.	Paper has all components, however, more Than one are incomplete.	Paper is missing some 1 or more components.

Teacher Commentary

Excellent topic for a persuasive essay. Students were able to make real life connection to their environment and be able to express themselves.

Sample Student Work:

No Idling

Did you know that about 57 million people experience ozone levels that exceed the standard by 501 or more? It's true, because of air pollutants like ozone, carbon monoxide, and nitrogen oxides. These pollutants are very bad for your lungs. Thanks to these pollutants many Americans are suffocating, so let's stop it.

First let's discuss the ozone. The ozone reacts to lung tissues because of this harmful pollutant changes in breathing passages causes both coughing and chest pains. Major ozone sources are refineries, gas-stations, motor vehicles, chemical plants, paints, and solvents. Smog is also the major harmful ingredient to cause ozone layers in the environment. Myriads of people lose their lives every day because of this horrible pollutant. The ways we can prevent this is by educating ourselves and stop the idling. This is just one of many ways to prevent this horrible cause of pollution.

The next pollutant is carbon monoxide. This pollutant is also very deadly because it is spread rapidly. Every year the number of deaths caused by carbon monoxide is increased. This toxin can stop our breathing and can make it harder for us to breathe if we are around it everyday. This is deadly substance that we have released in our air because many of us choose to idle.

Nitrogen oxides are chemicals precursor of ground level ozone. These are produced whenever fossil fuels are burned and primarily produced by motor vehicles and power plants. The sun's ultra violet rays project onto the ground level ozone. This can make ozone worse if we produce nitrogen oxides.

All of these are just a few facts on why idling is deadly to humans and the environment. In conclusion, stop idling because now you know that you aren't just harming yourself, you are also harming the environment and everyone else around you. We can all make a huge difference if we tell others about these harmful pollutants and take action to STOP IDLING!