



Lesson Plan and Teacher's Guide  
Grades 2 - 8

Dear Teacher,

San Diego and Imperial County have unhealthy air pollution. Both areas continue to fall short of state standards for smog (ozone) and particle matter.

Vehicle exhaust causes the majority of our local air pollution. About 50% of San Diego's smog comes from motor vehicle emissions. Imperial County's pollution comes from vehicles, diesel engines, and agricultural processes.

All of us must do our part to fight air pollution. Kids and adults alike can take action to help clean the air. By providing the "Kids for Clean Air" lesson plan to your students, you do a great deal to increase awareness about air pollution, its health impacts and what we can do as a community to improve our air quality.

For additional information or materials, please call the American Lung Association at 619-297-3901 or 800-LUNG-USA.

Sincerely,



**□ OBJECTIVES:**

**STUDENT WILL:**

1. Be informed that breathing dirty air is unhealthful to the lungs and body.
2. Be informed that our community has an unhealthful air pollution problem.
3. Discuss what air pollution is and what causes air pollution.
4. Discuss how air pollution can harm health and what to do on a smoggy day.
5. Discuss what children and adults can do to help make the air cleaner to breathe.
6. Draw a picture which shows what actions kids can take to keep the air clean.

**MINUTES**

5

20

20-30

**ACTIVITIES**

1. Introduction

2. Group Discussion

3. Poster Activity

**AUDIO / VISUAL**

Inside Your Lungs Poster

**TOTAL: 45 - 55 Minutes**

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**□ CLASSROOM INTRODUCTION**

1. Tell your class that people, animals and plants can live only if certain basic needs are met. The four basic needs of all living things are sun, air, water and soil.
2. Hold up the "Inside Your Lungs Poster" and explain that air enters the body through the lungs. Air (oxygen) keeps our bodies alive.
3. Explain that the lungs show the effect of the air they bring in. If we breathe only clean air, our lungs stay healthy and pink. But, when we breathe dirty (polluted) air, our lungs change color and darken from particles present in the air. Breathing dirty air can damage our lungs and make us sick.
4. Explain that we live in a community, where the outside air is not clean. Mention that San Diego and Imperial have a serious air pollution problem. Tell students that San Diego and Imperial do not meet state standards for smog and particle matter. Ask if anyone has noticed that on some days the air outside looks brown.
5. Tell the class that today they are going to learn about how air pollution can harm their lungs and what can be done about it.

**□ GROUP DISCUSSION**

Conduct your group discussion by asking the following questions:

1. Air pollution is air that has become so dirty with chemicals and other substances that it can harm human health, animals or the environment. What is our most most serious air pollution problem?

**Smog and Particles in the Air**

- Smog (ozone) is a gas that hurts the lungs. You can't see or smell it. Strong sunlight turns car exhaust and industrial emissions into smog.
  - Particles in the air (Particulate Matter) are caused by burning fuels like gasoline and by agricultural processes like field burning or soil tilling.
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2. Air pollution is caused by activities that people and machines do everyday. Can you think of some causes of air pollution?

**Causes of Air Pollution**

- |                        |  |
|------------------------|--|
| 1. Driving cars        | 6. Fires   |
| 2. Wasting electricity | 7. Flying planes   |
| 3. Smoking             | 8. Spraying chemicals<br>(paints, pesticides,<br>household products) |
| 4. Factory emissions   |  |
| 5. Burning trash       | 9. Burning fields  |

3. Breathing dirty air can make you feel sick and hurt your lungs. Have you ever felt sick on a smoggy day? How did you feel?

**Short-Term Health Effects**

- |                    |                        |
|--------------------|------------------------|
| 1. Irritated eyes  | 6. Shortness of breath |
| 2. Sore throat     | 7. Wheezing            |
| 3. Cough           | 8. Feel tired          |
| 4. Headache        | 9. Nausea              |
| 5. Chest tightness |                        |

**Long-Term Health Effects**

- |   |
|---|
| 1. Less lung power (harder to blow up balloons)   |
| 2. Irritated airways                              |
| 3. More colds and lung infections                 |
| 4. More susceptible to asthma (wheezing problems) |
4. Sometimes the air becomes so dirty that government officials announce a "smog alert" or "health advisory." Do you know what to do when the air is not good?

**Things To Do On Smoggy Days**

1. Avoid strenuous exercise (running, bicycling)
  2. Play indoors if you can
  3. Pay attention to how you feel
  4. Drink a lot of fluids
  5. Avoid dust, smoke and sprays
  6. Carpool and use less electricity
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5. Both kids and adults can do a lot to help clean up air pollution. Since most of our pollution is caused by car exhaust, we should try to use cars less. What are some things you can do to help keep the air clean?

### Things Kids Can Do To Help Keep Air Clean

- |   |  |
|---|--|
| 1. Ride a bike                                | 6. Recycle   |
| 2. Walk                                       | 7. Don't use spray products  |
| 3. Take the bus or trolley                    | 8. Plant a tree  |
| 4. Don't waste electricity                    | 9. Ask your parents to not pollute   |
| 5. Share a ride<br>(to school and activities) | 10. Ask your parents to report<br>smoking vehicles by calling<br>1-800-287-6653 (in San Diego) |

### □ POSTER/DRAWING ACTIVITY

Distribute the "Kids For Clean Air Coloring Sheet" to your class (or blank poster paper). Ask students to draw a picture showing what they can do to help make the air cleaner to breathe.

**Note:** If participating in the American Lung Association's "Kids For Clean Air Poster Contest," explain contest guidelines.

### □ SUPPLEMENTARY ACTIVITIES

You can do these activities for a few days to follow-up and reinforce clean air messages presented in this lesson plan.

1. Collect samples of air pollution
    - \* Set either a wide-mouthed collection jar containing water or a vaseline-coated plate outside near the classroom. Examine the container periodically.
  2. Car count for single-occupant vehicles
    - \* Take your class to a place near the school where they can observe traffic. Divide the class into small groups. Have each group count and record the number of cars with only one person inside them that drive by a designated spot. Let them count cars for 10 minutes. Following the activity, discuss how carpooling or taking the bus would have reduced the total number of cars on the road and air pollution emissions.
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3. Record local air pollution levels
  - \* Make an air pollution chart as shown and distribute to students or post in class. The U.S. Environmental Protection Agency's Air Quality Index is used to report daily air pollution levels to the public.
  - \* Ask students to look for daily smog levels in the weather report every day for a week. Watch TV, read the newspaper or call the San Diego Air Pollution Control District's Smog Hotline (858) 650-4777. Record the highest air pollution number each day on the chart. Have class discuss how to protect their health on unhealthy smoggy days. Note: Students can also log on to the California Air Resources Board web site [www.arb.ca.gov](http://www.arb.ca.gov) and click "Air Quality and Emissions."

Air Quality Index		
AQI Index Values	Health Categories	Cautionary Statements for 8-Hour Ozone and Color
0-50	Good	None (Green)
51- to 100	Moderate	Unusually sensitive people should consider limiting prolonged outdoor exertion. (Yellow)
101-150	Unhealthy for Sensitive Groups	Active children and adults and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion. (Orange)
151-200	Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion, everyone else especially children, should limit prolonged outdoor exertion. (Red)
201-300	Very Unhealthy	Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else especially children, should limit outdoor exertion. (Purple)
301-500	Hazardous	Everyone should avoid all outdoor exertion. (Maroon)

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**☐ MORE INFORMATION ON SMOG (OZONE) AND OTHER CONTAMINANTS**

San Diego Air Pollution Control District      858-650-4707

Imperial County Air Pollution Control District      760-482-4606

**☐ WEBSITES FOR AIR POLLUTION INFORMATION**

American Lung Association of San Diego  
& Imperial Counties      [www.lungsandiego.org](http://www.lungsandiego.org)

American Lung Association      [www.lungusa.org](http://www.lungusa.org)

California Air Resources Board      [www.arb.ca.gov](http://www.arb.ca.gov)

San Diego Air Pollution Control District      [www.sdapcd.co.san-diego.ca.us](http://www.sdapcd.co.san-diego.ca.us)

U.S. Environmental Protection Agency      [www.epa.gov/air](http://www.epa.gov/air)

U.S. EPA Kids Website      [www.epa.gov/kids](http://www.epa.gov/kids)

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