

# IN THE AIR

## IN THE AIR

[www.intheair.org](http://www.intheair.org)

### Pre-Activity #1

"Dirty Air Cards"

K-3 EDUCATION MODULE



 MISSOURI  
BOTANICAL  
GARDEN

## Correlation with Education Standards Summary

### Pre-Activity # 1 “Dirty Air Cards”

For a narrative description of these standards and how they relate to the connecting activities please refer to the Teacher’s Guide.

#### National Standards

SOURCE: [www.education-world.com/standards](http://www.education-world.com/standards)

NPH-H.K-4.1  
NPH-H.K-4.2  
NPH-H.K-4.3  
NPH-H.K-4.4  
NPH-H.K-4.6

NL-ENG.K-12.4  
NS.K-4.1 a, b  
NS.K-4.4 a, b  
NS.K-4.6 a, b, c  
NSS-G.K-12.5 a, b, c

#### Missouri Show-Me Standards

SOURCE: [www.dese.mo.gov/standards](http://www.dese.mo.gov/standards)

Performance Standards:  
GOAL 1: 6, 10  
GOAL 2: 1  
GOAL 3: 1  
GOAL 4: 1, 7

Knowledge Standards:  
CA 6  
HPE 5, 6  
SC 8

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# IN THE AIR

## Pre-Activity #1

### OVERVIEW

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This guided discussion activity provides background information for students prior to viewing the puppet show or doing Connecting Activities.

Clean air is essential for good health. Everyone—even young children—can help make the air cleaner by being informed and by making personal choices that result in cleaner air.

### GOALS

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- To present basic facts about air pollution to young children in ways that avoid causing undue anxiety
- To emphasize that having clean air is everyone's responsibility
- To present a positive message that something can be done to clean up dirty air

### OBJECTIVES

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**When Pre-Activity #1 is completed, students will be able to do the following:**

- Describe two things that make the air dirty.
- State two ways to avoid making dirty air.

### MATERIALS

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- Dirty Air Cards (there are four cards, double sided.)

### PROCEDURES

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#### 1. What is air?

Begin by talking about the clean air we breathe in relation to our senses. Can you see air, touch it, smell it, and taste it? No, because clean air is made up of gases that we cannot see, touch, smell, or taste. But sometimes we can see, touch, smell, and taste things that make the air dirty.

#### 2. What makes the air dirty?

Ask children to name unpleasant things in the air that we can see (smoke, soot, dust), touch or feel (bits of sand, dust, soot), smell (sour milk, dirty socks), and taste (smoke, soot, dust). For older students, introduce the water cycle concept to illustrate how air pollutants fall on land and water and are carried to other places.

### “DIRTY AIR CARDS”

#### Recommended Grade Level:

K-3

#### Preparation Time:

If you are using the puppet show *Gloomy-Doomy, Go Away!* (Core Activity), read the script.

**Time: 30 minutes**

Copy Dirty Air Cards and explanations for use in the introduction.

**Time: 10 minutes**

#### Presentation Time:

Approximately 20 minutes

## PROCEDURES (CONT.)

### **3. How does dirty air make people feel?**

Discuss how some of the unpleasant things in the air may cause people to be uncomfortable or sick. With older children, talk about asthma, a breathing disorder that affects millions of children and is made worse by dirty air.

### **4. How does the air get dirty?**

Ask children for their ideas. For visual reinforcement, use Dirty Air Cards and explanations. Discuss how the objects on each card make the air dirty. (The pictures on the cards were chosen to depict objects and practices with which children are most familiar and most likely to encounter. Each card carries supplemental information for teachers about that particular source along with special messages for children.)

### **5. What can be done about dirty air?**

Discuss ways in which young children can help keep the air clean.

1. Walk or ride to places nearby rather than ride in a car.
2. Plant trees and other growing things that help keep the air clean and help your parents care for them.
3. Do not burn anything outdoors. Put leaves and trash in bags for proper disposal. Decide now that you will never smoke tobacco.

Discuss how children can protect themselves from bad air.

1. Do not stand near the exhausts of buses, cars, or other vehicles.
2. Ask your parents to buy safe substitutes for paint, glue, household products, and insect spray. If you must use such products, do it where you have plenty of fresh air.
3. Never let anyone talk you into breathing fumes from anything.

## CONCLUSION

- If you are using the puppet show as scripted, tell students they are going to watch a puppet show about clean and dirty air. Before that, they will make their own hand puppets to use during the show.
- If you are omitting the puppet show, go directly to the Connecting Activities to reinforce what the students have learned in the Pre-Activity lesson.

## EXTENSIONS FOR PRE-ACTIVITY #1 (GRADES 2-3)

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### 1. Breathing

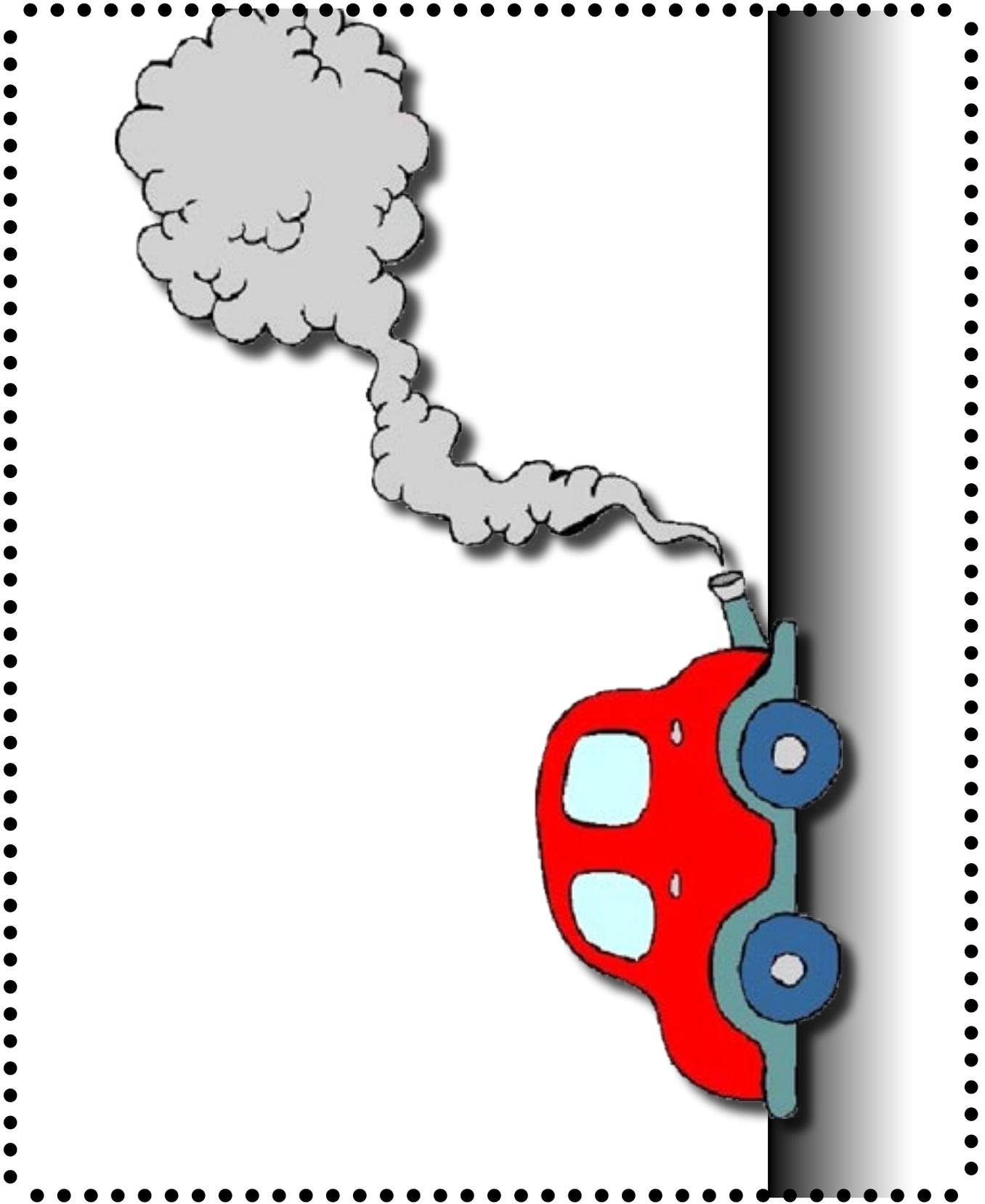
- <http://www.niehs.nih.gov/kids/baylor/homeair.htm>: Presents information and demonstrations about how humans breathe. It also includes other activities about impurities in indoor air and how they affect human health. (National Institute of Environmental Health Services)
- <http://www.epa.gov/airnow/aqikids/>: Describes the Air Quality Index, what the colors mean, and what children should or should not do on bad air days. Special emphasis is placed on people with asthma and other breathing problems. (Environmental Protection Agency)

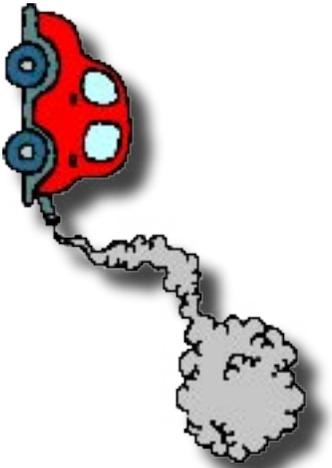
### 2. Water Cycle and Air Pollution

- <http://ga.water.usgs.gov/edu/watercycle2ndgrade.html>: Contains a number of activities about the water cycle including a project by a second grade class in Australia. (United States Geological Survey)



DIRTY AIR CARDS





# What makes the air dirty?

Fumes from cars make the air dirty.

## BASIC INFORMATION ABOUT MOBILE SOURCES

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### DEFINITIONS:

Mobile sources are automobiles, trucks, tractors, trains, and other vehicles that produce air toxics through fuel combustion and evaporation. Air toxics are pollutants known or suspected to cause cancer or other serious health and environmental effects.

### TOXICS PRODUCED BY MOBILE SOURCES:

According to the Environmental Protection Agency (EPA), "Nationwide mobile sources represent the largest contributor to air toxics." For more information about mobile sources and the risks they pose, see:

<http://www.epa.gov/otaq/>

### ALTERNATIVES FOR ADULTS

- Buy vehicles that are fuel-efficient or those that run on other power sources.
- Use cleaner burning fuels when available.
- Keep your vehicle in good condition.
- Plan errands and shopping so that fewer trips are necessary.
- Carpool or take a bus to work.

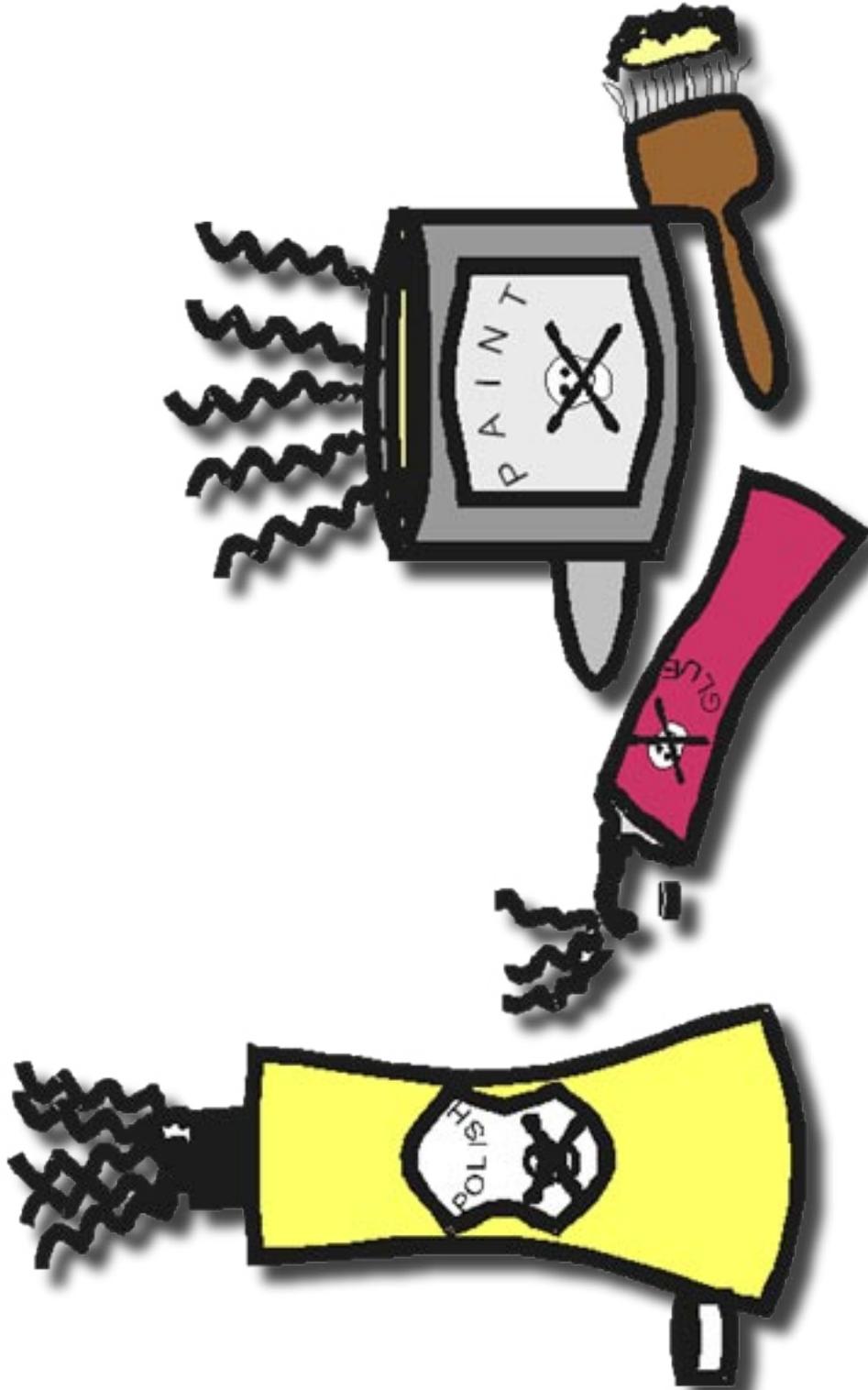
## MESSAGES FOR CHILDREN

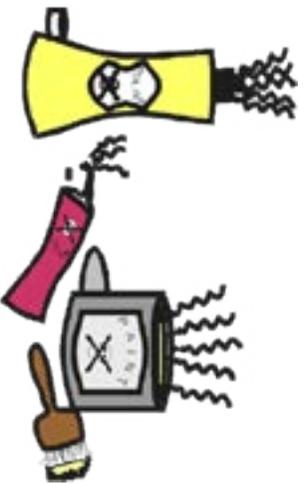
! Do not breathe exhaust fumes from cars, buses, lawn mowers, or any other machines.

! To avoid breathing in gasoline fumes, do not stand outside at service stations when your parents are filling up the gas tank.

? What are some ways to get somewhere without using a car?

? Trees and plants can help clean the air. Do you know where you can grow trees or plants?





## What makes the air dirty?

Fumes from products such as certain paints, glues, and spray cans can make the air dirty.

### BASIC INFORMATION ABOUT FUMES FROM PRODUCTS

#### **COMMON PRODUCTS MAY CONTAIN HARMFUL FUMES:**

Household products including oil-based paints and paint strippers; solvents; wood preservatives; disinfectants; moth repellents; stored fuels and automotive products; hobby supplies; spray pesticides; polishes.

#### **ALTERNATIVES:**

Many safer alternatives without harmful fumes may be available. **CAUTION:** Not all products advertised as environmentally friendly live up to that billing, so be informed when making selections. Many noncommercial websites on the Internet provide guidelines for buying green household products. For examples please see the following website:

<http://www.buygreen.com/list.htm>

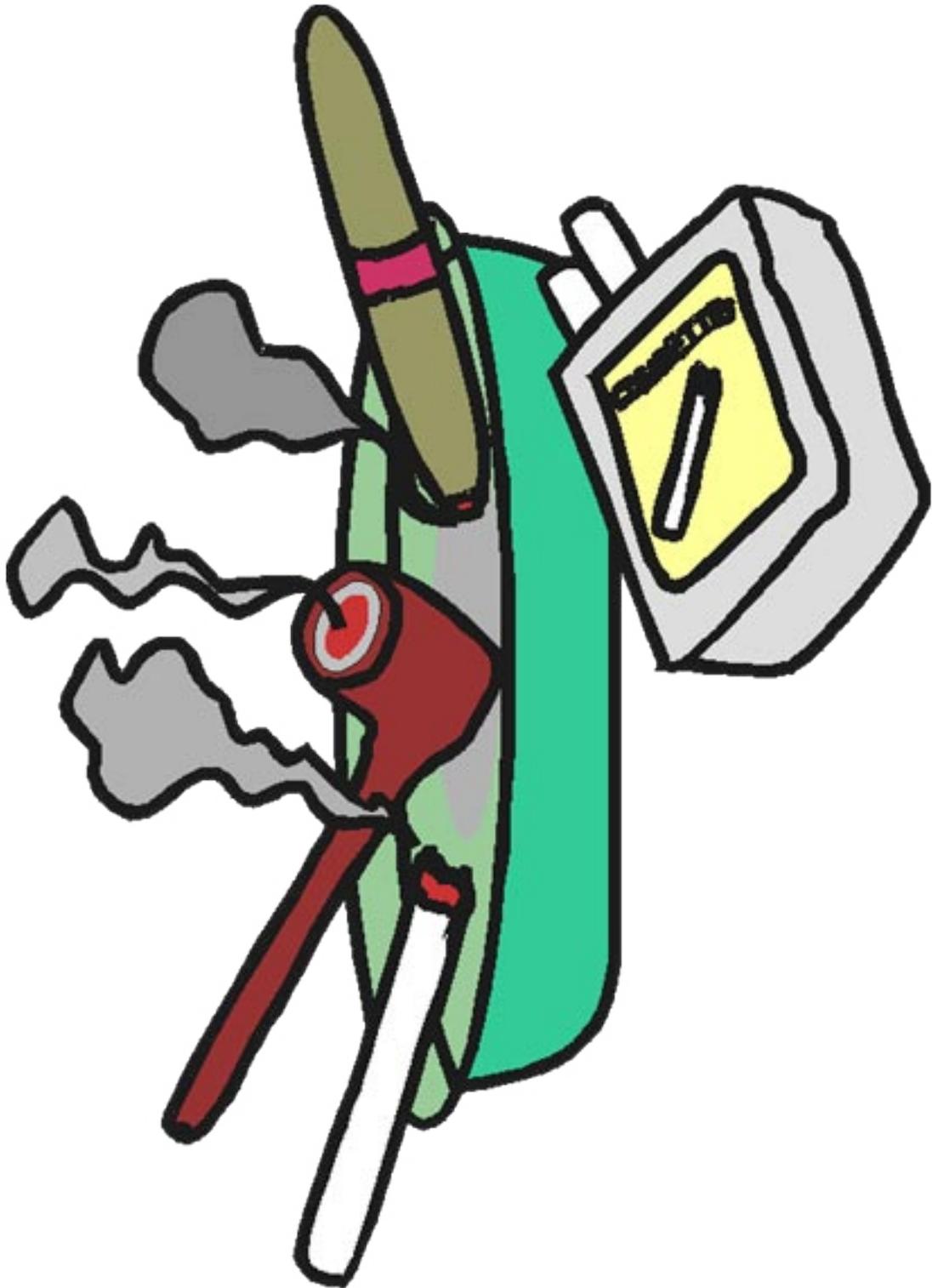
For more choices, enter the key words "green products."

**SOURCE:** Environmental Protection Agency

<http://www.epa.gov/iaq/voc.html>

### MESSAGES FOR CHILDREN

- ! Some paints and glues are safe for children to use, such as those we use in the classroom. Other products should be used with supervision.
- ! Bug sprays should be used only by adults.
- ! Always ask your parents or another adult to help you use paints, sprays, glue, and household cleaners.
- ! Always put the caps and lids back on glue, paint, markers, and other craft items you use.
- ! Never smell or taste anything that you do not know about.





# What makes the air dirty?

Tobacco smoke makes the air dirty.

## INFORMATION ABOUT TOBACCO SMOKE

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### FACTS:

According to the Center for Disease Control, “Environmental tobacco smoke contains at least 250 chemicals known to be toxic or cause cancer. Unfortunately, the general public’s exposure to secondhand smoke is much higher than most people realize.”

### Some of the chemicals include:

- Acetone: an irritant, a poisonous industrial solvent.
- Ammonia: a corrosive gas.
- Arsenic: a carcinogen, for which no safe level of exposure exists.
- Benzene: human carcinogen, for which no safe level of exposure exists.
- Butane: a flammable chemical in lighter fluid.
- Cadmium: a carcinogen and a teratogen (can harm a developing fetus), which is used in batteries.
- Carbon Monoxide: a poisonous gas in auto exhaust.
- Cyanide: a very poisonous chemical.
- Dioxin: one of the most toxic chemicals known, with no safe level of exposure.
- Formaldehyde: a carcinogen, for which no safe level of exposure exists.
- Methanol: jet engine and rocket fuel.
- Polonium-210: a radioactive element.
- Toluene: a teratogen and a poisonous industrial solvent.

## MESSAGES FOR CHILDREN

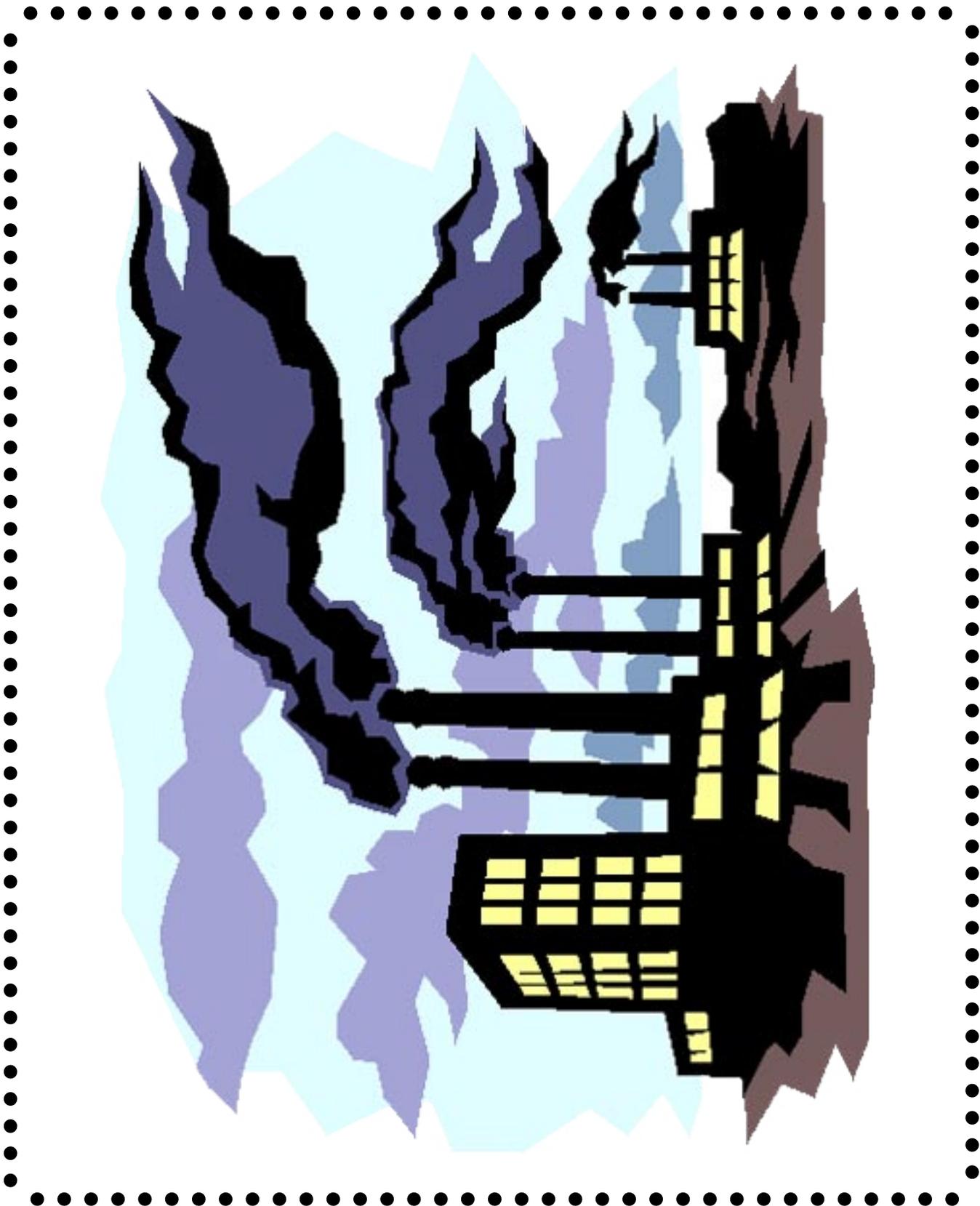
! Make a decision to keep your body healthy. Decide to not smoke and do not let anyone change your mind.

? Some houseplants can help clean the air. Do you have a place at home to grow one or more houseplants?

### SOURCE:

Alliance of Boulder County on Tobacco and Health

<http://bcn.boulder.co.us/community/abct/>





# What makes the air dirty?

Pollution from smokestacks makes the air dirty.

## BASIC FACTS ABOUT STATIONARY SOURCES OF AIR TOXICS

### **DEFINITION:**

The United States Environmental Protection Agency (EPA) is mainly concerned with emissions which are or could be harmful to people. Large industrial units (factories, power plants, and smelters) along with smaller industrial units (dry cleaners, degreasing operations, etc.) are designated in the Clean Air Act as stationary sources of air pollutants to differentiate them from mobile sources. Large industrial units are also referred to as “point” sources, and small units as “area” sources. Both point and area sources emit a wide variety of pollutants.

### **FACTS ABOUT STATIONARY SOURCES:**

- Although factory smokestacks have become an icon for all air pollution, stationary sources contribute less air pollution as a whole than mobile sources.

### **SOURCE:**

<http://www.epa.gov/air/>

For other ways for students to help keep the air clean, go to the Environmental Explorers Club on the following website:

<http://www.epa.gov/kids/air.htm>

## MESSAGES FOR CHILDREN

**!** You can help keep the air where you live clean and fresh when you do not waste things.

**\*** Save electricity by turning off lights, TVs, and computers when you are through using them.

**\*** Shut the refrigerator door quickly after finding what you want.

**?** Why do these things help keep the air clean?

Because most electricity comes from power plants with big smokestacks that make the air dirty. The more electricity you use, the harder the power plant has to work, and the dirtier the air gets.

**\*** Trees and plants can help clean the air. Are there places you can grow trees or plants?