

# Better Air for Our City

Afterschool/Summer: Middle School

## Lesson 3: Dirt In My Air?



Lesson One: Our Air, Our Street

Lesson Two: Who's Driving Around Our Block?

→ Lesson Three: Dirt in My Air?

Lesson Four: That Air's In My Lungs?

Lesson Five: Climate Change and My Street

Lesson Six: What's My Carbon Footprint?

Lesson Seven: Better Air for Your Block

Lesson Eight: Share Your PSA

## Dirt in My Air?

### **BIG IDEAS** To Share With Your Students

#### VEHICLES POLLUTE OUR AIR

Cars and trucks release lots of things into that are bad for us and the planet, including greenhouse gases and particulate matter. We reduce air pollution when we carpool, use public transportation, bike, or walk, and when we don't idle our cars ("idle" means leave the engine running while the car is standing or parked).

#### WE CAN MEASURE "PARTICULATE MATTER" IN OUR AIR: THE DIRTY EXHAUST THAT COMES OUT OF VEHICLES

Particulate matter is made up of particles of soot and metals, and gives smog its dark color. We are going to study particulate matter by creating our own boards and looking at how much "dirt" ends up on them after a few days outside. It's a simple experiment with valuable results!

### Know the Facts

- In addition to emitting particulate matter, cars release nitrogen oxides, hydrocarbons, sulfur dioxide, carbon monoxide, and toxic chemicals, which are also not good for your health.
- Very small particles are the worst for our health, because they can get deep into your lungs, and some may even get into your bloodstream
- There is a tool called the Air Quality Index that helps us find out how clean or polluted our air is day-to-day, and what effects it may have our health. To find the current air quality for your area, go to: <http://airnow.gov/>

(Source: Union of Concerned Scientists, Air Now <http://www.airnow.gov>)



### Main Activities

The students will create "particulate matter boards" out of index cards and leave them out for a few nights to see if the air is dirty.

- Put students in pairs
- Talk about particulate matter in the air
- Make particulate boards
- Leave the particulate boards out for 2-3 nights

### Materials Needed

- Large index cards (4x6, lined on one side)
- Glue
- Wax paper
- Scissors
- Petroleum jelly
- Paper clips
- Yarn or twine



## Dirt in My Air?



LENGTH OF LESSON: 1 HOUR

### Description of Activities

- 1) Class discussion (10 minutes) Ask the class if they have ever thought about whether the air is actually “dirty.” Explain to them that particulate matter is part of the exhaust that comes out of cars. You can also talk about some of the facts from “Know The Facts” on the preceding page.
- 2) Make Particulate Matter Boards (20 minutes) Divide the class into partners: one partner will be part of the control group (card facing inside), and one will be the experimental group (card facing the street). To make it easy for partners to find their pair of cards a few days later, have them create a symbol that they draw on each pair. Take a large (4x6) index card and have each student turn the card so the lined side is facing up. Students write the following on the lined side: names and a prediction for how it will look after being outside for several days. Turn over the cards, cut out wax paper, and have the students glue the wax paper to the blank side of the index card. Then attach paper clips to the top corners by poking holes through the top corners of the cards. Smear the wax paper with a thin coat of petroleum jelly.
- 3) Leave Particulate Matter Boards Outside (25 minutes) Using the paper clips as hooks, put your boards outside (half the class’ cards facing inside the school courtyard, garden, or another classroom, half facing the street).
- 4) Class discussion (5 minutes) Note where you have left the cards outside, and plan to come back in 3 days to collect them. Ask the kids what they think the cards will look like when they get them back. What are some variables that could effect what they look like?

### Tips for Success

- Scout out the area around the school ahead of time to decide where are you going to place these boards
- Be sure to only use a thin coat of petroleum jelly or the particulates won’t stick to the board
- Depending on where you put them (a window, fence, pole, etc) you will need yarn, twine, or another paperclip to secure the index cards
- If the forecast calls for rain, you can find a place that’s sheltered. If it rains on the cards, you may need to do the experiment again.

### Resources

- Union of Concerned Scientists  
<http://www.ucsusa.org/>
- EPA:  
<http://www.epa.gov/particles/>
- AIR NOW  
<http://www.airnow.gov>