

# Clean Air Detective

## Lesson Objective

In this lesson students will participate in a scientific inquiry activity regarding the air they breathe inside and around their house. Students will also help to reduce air pollution by shutting off lights, toys, machines and other appliances.

## Activating Prior Knowledge & Concept Building

Begin by preparing three covered glass jars. Place objects in two of the jars, and don't put anything into the third jar. Show the students the jars and ask them how many jars have something in them. **The answer is that all three jars contain something.** The empty jar actually contains air. If no student answers, "Three jars," right away, continue to prompt them so that they know they need to look at the jars in a different way. After a student guesses correctly, or you tell them the answer, discuss how air is all around us even though we can't see it.

Next, show students a photograph of a city on a day when the sky is clear and a day when it is blanketed in pollution. Show students the picture of the polluted skyline and ask them if they know what causes the sky to look the way it does. Discuss how clean air is good for people to breathe and that dirty air is not good for people to breathe.

**Background knowledge:** Air Pollution is when unwanted chemicals, gases, and particles enter the air and atmosphere, causing harm to animals and damaging the natural cycles of the Earth. Human activity is a major source of air pollution. Air pollution caused by humans are related to cars, factories, power plants, burning of fossil fuels, and fumes from spray cans to name a few. Some negative effects of air pollution is the depletion of the ozone layer, global warming, and overall health.

## The Science Behind It

The actual gas or substance that causes air pollution is called a pollutant. Major pollutants include:

1. Sulfur Dioxide ( $\text{SO}_2$ ) - generated by burning coal,  $\text{SO}_2$  can cause acid rain, as well as respiratory diseases such as asthma.
2. Carbon Dioxide ( $\text{CO}_2$ ) - released by humans and animals,  $\text{CO}_2$  is also generated by burning fossil fuels.
3. Carbon Monoxide - very dangerous, released by cars
4. Particulate Matter- this includes things like dust. If it gets into the atmosphere, it can cause diseases, such as lung cancer.
5. Electricity- Most of the world's electricity is created from burning oil and coal. Overconsumption of electricity can contribute to unnecessary environmental effects.

## Materials:

- 3 glass jars
- Science journals/or sheets of paper for students to document their findings.

## Instructions for Instructor:

1. Tell students that they are going to begin a class project to see what they can do to help stop air pollution. Explain to students that, where air pollution is concerned, the little things that everyone does really do help stop air pollution.
2. Tell students that they are going to keep track of how many lights, toys, machines and appliances they shut off every day. Ask students to keep count of how many things they shut off every day and bring the total to school each day for a week. Tally the numbers every day and record them on the graph.
3. Create a class report that explains what they did, why it is important and the total number of electrical shut offs and/or miles recorded on the graph.

## Closing

Review the activities of the day with the students and assess what concepts they took away or what they missed. List the key learning points on the board. Have students reflect on the activity by sharing out and writing about it in their science journals (or activity document).

**Debrief Questions:** How has this activity affected your knowledge about the amount of electricity that you use? Are you going to change how much electricity you are going to use? Why do you think it is important to limit your use of electricity? Have your thoughts about pollution changed? How so?

Source:

[http://www.ducksters.com/science/environment/air\\_pollution.php](http://www.ducksters.com/science/environment/air_pollution.php)  
[http://pbskids.org/eekoworld//parentsteachers/lessons1\\_1.html](http://pbskids.org/eekoworld//parentsteachers/lessons1_1.html)