



Air Pollution Experiment

Grade Level: 4th - 5th

Objective:

The purpose of this activity is to evaluate the various sources of pollutants and their impact on our environment and health. By successfully identifying pollution, students will be able to understand the correlation between air quality and climate change.

Introduction:

Air pollution is comprised of gases and particles that can be harmful at high concentrations. In this lesson, students will observe, identify and chart both visible and invisible air pollutants, and through an art project describe solutions for preventing air pollution in their communities.

Materials and Equipment:

Index card
Petroleum jelly
Tape
Paper
Pen

Keywords and Concepts:

Pollution
Atmosphere
Seasonal weather
Particulate matter

Research Questions:

1. Where did you put your Air Pollution Collector card?
2. Are there any nearby sources of air pollution that you can see or that you know about?
If so, what are they?
3. What kinds of air pollution do you think you will collect?
4. What do you think the card will look like after a few days?

Experimental Procedure:

Day 1:

1. Over the next two days, we are going to study particulate air pollution around our school. We will be 'collecting' air pollution samples in and around the school on petroleum jelly-coated index cards. The index cards will be left for a couple days at various sites around our school.

- “Why do you think we will coat the index cards with petroleum jelly?” (Some pollutants will stick to the petroleum jelly for us to see.)
- “Where do you think we could place a card that might show air pollution (Near the bus turnaround, by an open window, near a heating vent.) “Where would be some places that might not show air pollution?” (Undisturbed spot in the classroom, Principal’s office.)
- Keep a list of good test areas around the school; adding some spots as needed; these can be inside or outside, as long as other classes are not disturbed.

2. Divide the class into pairs. Provide each pair with one index card, petroleum jelly and a swab, and a piece of construction paper. Provide the following instructions:

- Staple or glue the index card to the center of the construction paper.
- Write the names of the students in the group and the sampling location they’ve selected above the card.
- Write “Investigation in progress. Please do not disturb.” below the index card.
- Swab a thin layer of petroleum jelly on the index card.

3. Next, distribute a copy of the questions to each pair and ask them to read the questions so that they know what they have to record about their sites. Have students place the cards in test areas, one card per test area. Use pins or tape as needed to secure the cards. The petroleum side should be facing out.

4. Once all groups have placed their cards, return to class and have pairs complete the questions together. Lead a discussion of questions, prompting students to identify possible sources of air pollution nearby or at the school.

Day 2 or 3:

1. Air pollution collector cards should remain in the test areas for at least two whole days, but preferably over several days, or a weekend. You may want to have groups check their cards daily and report back to the class on their observations.
2. Bring cards back to class for comparison. Consider having students look at their collector cards under magnification if microscopes or magnifying glasses are available.
3. Observe and rank the cards from the one with the most visible pollutants to the one with the least. You can do this by placing cards side by side on a table.
4. Lead students in a discussion about air pollution at the school:
 - Where around the school was the most visible air pollution collected?
 - Where was the least?
 - What assumptions can students make about air quality around the school and the proximity to sources of air pollution?

Concluding questions:

1. Did your Air Pollution Collector card change color? If so, what color is it now?

2. What do you see in the petroleum jelly? List what you see:
3. What do you think are the sources of this air pollution? List the sources:
4. How does air pollution affect your health?
5. How does air pollution affect the environment?
6. What are some ways to prevent air pollution?
7. Do you think your card would look different at a different time of year? Why or why not?