TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Lesson Plans for Teachers
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Particulate Matter: How Dirty is the Air We Breathe?

Purpose

To make a simple tester that we can use to collect and observe the pollution in our air.

Grade Level

- 4th grade

Science TEKS

- 4.1 a, b
- 4.2 a-e

Objective

Students will collect and study pollution from the air.

Focus

Tell the students, "As we look outside, we see a clear blue sky. Where is the pollution? We are going to make a simple tester for air pollution so we can see the pollution."

Materials

- a plastic square (5 centimeters by 5 centimeters)
- petroleum jelly
- masking tape
- block of wood
- white paper for each child or each group of children

Background

The atmosphere is almost completely made up of invisible gaseous substances. Most major air pollutants are also invisible, although large amounts of them concentrated in areas such as cities can be seen as smog. One often visible air pollutant is particulate matter, especially when the surfaces of

buildings and other structures have been exposed to it for long periods of time or when it is present in large amounts. Particulate matter is made up of tiny particles of solid matter and/or droplets of liquid. Natural sources include volcanic ash, pollen, and dust blown about by the wind. Coal and oil burned by power plants and industries and diesel fuel burned by many vehicles is the chief sources of manmade particulate pollutants, but not all important sources are large scale. The use of wood in fireplaces and wood burning stoves also produces rather significant amounts of particulate matter in localized areas, although the total amounts are much smaller than those from vehicles, power plants, and industries.

Procedure

1. Coat the plastic square with a thin, even coat of petroleum jelly. With masking tape, fasten the square, jelly side up, to the wooden block.
2. Place the block outdoors on a post, fence, wall or window sill. Leave it for 24 hours.
3. Remove the plastic square from the block. Lay it on white paper.
4. Let the students examine the pollution which was collected on the petroleum jelly.
5. Let the groups record the findings of their tester.

Have groups share their findings with the other groups. Did your plastic square collect any dirt particles? How does your square compare to those of the other groups? In what places does the air seem to be the dirtiest?

We have seen dirt where we saw nothing. We must have air to live. We must do everything we can to clean the air we have and keep our future air clean.

Extensions

Have students write a paper and explain the differences they observed among the plastic squares.

Have students take their tester home to test the pollution for 24 hours. Students will then report to the class of their findings.

Ask students to leave the tester outside for a week, a month (shelter from precipitation). Students will keep a journal of its progress each day and report to the class.

Have students compile data on their findings and write the mayor about their samples.

Reference

Holt Science 6th. Holt, Rinehart, and Winston Publishers, New York. p. 257.

Acknowledgment

Alica L. Smith and Stacy Butler, Stephen F. Austin University Nacogdoches TES Course, 1994