

# ***Particulate Matter: The Lorax***

## **Source of Lesson:**

<http://www.tnrcc.state.tx.us/air/monops/lessons/partlessonK.html>

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## **Description of class:** N/A

**Length of Lesson:** 50 min

**Grade Level:** Kindergarten

**Honors or regular:** N/A

## **The Lesson:**

### **I. Overview**

This lesson will help students to see how dirty air really is.

### **II. Resources, materials, and supplies needed**

- labels
- colored markers
- five jar lids
- white cardboard or oak tag
- magnifying glasses

## **Engagement:**

Read, *The Lorax* by Dr. Seuss. Discuss with children how the smogulous smoke produced by the THNEEDS factory made the Lorax cough, whiff, sneeze, snuff, snarggle, and croak. Talk with students about air pollution produced by cars and other machinery with gas-burning engines, as well as emissions produced by furnaces, fireplaces, factories, and incinerators. Then have the students work with a partner to conduct this experiment to see how dirty the air really is.

## **Background:**

Particulate matter is made up of tiny particles in the atmosphere that can be solid or liquid (except for water or ice) and is produced by a wide variety of natural and manmade sources. Particulate matter includes dust, dirt, soot, smoke and tiny particles of pollutants that have attracted an amount of water so small that it does not fall to the ground as rain. Major sources of particulate pollution are factories, power plants, refuse incinerators, motor vehicles, construction activity, fires, and natural windblown dust. Particles below 10 microns in size (about seven times smaller than the width of a human hair) are more likely to travel deep in the respiratory system, and be deposited deep in the lungs where they can be trapped on membranes. If trapped, they can cause excessive growth of fibrous lung tissue, which leads to permanent injury. Children, the elderly, and people suffering from heart or lung disease are especially at risk.

**Procedure:**

- 1) Write the numbers one through five on the labels. Then attach a label to the top of each jar lid.
- 2) Place the jar lids on the cardboard. Carefully trace around the jar lids. Then number these circles to match the labels on the lids.
- 3) Take the lids and cardboard outside. Place them flat in an open area. (Note: Rain will spoil the results, so remind students to bring the experiment inside if the weather turns inclement.)
- 4) At the end of the first day, have the children remove one lid, starting with number one. Repeat this procedure for the next five days, taking away one lid each day. Have students compare the circles as they remove the lids. What observations can they make as the days go by?
- 5) At the end of the fifth day, take away the last lid and look at the circles. If the air is dirty, the circles covered by the low-numbered lids will have more specks of dirt than the others. Have the children use magnifying glasses to count the dirt specks.
- 6) Discuss results of experiment. Ask the students, "Is our air clean or is it dirty?"

**Extensions:**

- 1) See the Particulate Matter Information, Activities and Data page ( <http://www.tnrcc.state.tx.us/air/monops/lessons/partinfo.html> ) for suggested activities using particulate matter data collected by the Texas Natural Resource Conservation Commission and provided in the El Paso Particulate Data, Houston Particulate Data, El Paso Particulate Map, and Houston Particulate Map files.
- 2) Make a list of things students can do to fight air pollution.