

Air Pollution Control



Target Grade Levels

Sixth - Eighth

Time

One hour

Materials

None

Knowledge and Skills (TEKS)

- Science:
 - Properly demonstrate the use of laboratory equipment;
 - Observe physical and chemical properties of matter; and
 - Measure physical and chemical properties of matter.
- Language Arts:
 - Writes complete sentences accurately, using various types of sentences and both dependent and independent clauses;
 - Evaluates own research for accuracy and completeness and then frames questions for further study; and
 - Follows accepted format (MLA) for writing research, including bibliography and endnote preparations.

Overview

To show how air pollution is controlled.

Background Information

Air contaminants are emitted into the atmosphere as particles, aerosols, vapors, or gases. The most common methods of eliminating or reducing pollutants to an acceptable level are destroying the pollutant by thermal or catalytic combustion, changing the pollutant to a less toxic form, or collecting the pollution by use of equipment to prevent its escape into the atmosphere. Pollutant recovery may be accomplished by the use of one or more of the following: baghouses, cyclones, electrostatic, precipitators and wet scrubbers.

Procedure

1) Vocabulary

- | | |
|--------------------------------|---------------|
| a) baghouses | g) particle |
| b) cyclones | h) vapor |
| c) electrostatic precipitators | i) gas |
| d) wet scrubbers | j) combustion |
| e) atmosphere | k) catalyst |
| f) aerosol | l) toxic |
| | m) pollutant |

2) Activities

Here are two activities to help demonstrate how a wet scrubber and an electrostatic precipitator work.

- i) Activity 1
(www.tnrcc.state.tx.us/air/monops/lessons/wet.html) demonstrates how to build a wet scrubber.
- ii) Activity 2
(www.tnrcc.state.tx.us/air/monops/lessons/precip.html) demonstrates how to build an electrostatic precipitator.

3) Review

Discuss with students the following questions:

- a) Which type of air cleaner would be the best for removing particles?
- b) Which type of air cleaner would be the best for removing waste gases?
- c) Does a wet scrubber clean up all of the pollutants?
- d) What problems are produced by having too many pollutants in the air we breathe?
- e) If industry is just part of the problem, what can we do to control the amount of air pollution that we cause?

4) Evaluation

Extension activities can be performed as graded exercises.

5) Extension

Students can choose an industry that creates air pollution in the local region, then research the methods and equipment they use and/or are required to use to control air pollution, then write a report including the information on the following

- i) The type of pollution control device
- ii) How it works
- iii) The principle behind how it works
- iv) Current purchase and operations costs
- v) What other processes, purchasing, and planning the company does to reduce the amount of pollution that leaves their facility.

Adapted from: "Air Pollution Control" *Texas Commission on Environmental Quality*.
www.tnrcc.state.tx.us/air/monops/lessons/lesson_plans.html.

Reference: Activities from Holt, Winston's Environmental Science.

Acknowledgment: Lyn Mock, Stephen F. Austin University Nacogdoches TES Course, 1994