



DEPARTMENT OF ENVIRONMENTAL QUALITY

150 W. Congress Street
Tucson, AZ 85701-1317

Ursula Kramer
Director

520.740.3340
www.deq.pima.gov

Lesson Plan: Airborne Dust Control Presentation for Youth (Grades 4-8)

Prepared January 2004

Author: Pima County Department of Environmental Quality
Fugitive Dust Outreach & Education Program

Contact: Karen Wilhelmsen
karen.wilhelmsen@deq.pima.gov, 520.740.3345

Title: Got Dust? Ride it Down!

Subject: Particulate Matter air pollution: causes, effects, solutions

Subcategory: Airborne dust issues regarding off-road vehicle use on vacant land

Description: Students learn about air pollution with a focus on Particulate Matter. They learn about the effects of particulate matter, and possible solutions to reduce air pollution. Students participate in role-play activity and discover different perspectives in a current, real-life situation regarding airborne dust in a residential neighborhood. Groups of students portray off-road vehicle riders, vacant landowner, neighbors, PDEQ field services inspector, and Pima County Sheriff Deputies, and try to resolve conflict between each group's needs.

Intended Audience: Youth grades 4-8.

Duration: 45-60 minutes.

Goals: Students will gain a greater awareness of air pollution issues, specifically regarding Particulate Matter. Individuals will be inspired to take action in their personal lives to reduce air pollution, and/or reduce their exposure to air pollution in general.

Objectives: Students will play different roles related to opposing perspectives on dust control issues. The issues are associated with off-road vehicle use on vacant land in a residential neighborhood.

Educational

Resources: Background information cards and extra paper copies on: off-road vehicle riders, landowner, neighbors, Pima County DEQ, and the Sheriff's Department.

Props

Props are optional, can be substituted appropriately, and are greatly beneficial in adding excitement and interest in learning. The following list includes props PDEQ uses.

Setting up the scenario: cloth to represent area of desert land, Duplo blocks for homes, toy quad (off-road vehicle), toy bicycle, toy child

Off-road vehicle users: helmet, gloves

Vacant landowner: hat, tie

Neighbors: watering can, trowel, garden gloves

PDEQ inspectors: PDEQ "Got Dust?" hat, clipboard, pen

Sheriff: sheriff badges, caution tape

Visuals and demonstration

Air pollutant identification posters

Particulate Matter size comparison chart

Unused and used filters from monitoring sites

Electron microscope images of Particulate Matter 2.5

Healthy/unhealthy pigs lungs comparison kit

Reference

Materials: PDEQ Fugitive Dust Program outreach and education staff
Brochures: *Riding Responsibly for the Environment, for Others, for Yourself*
Dust control on Open and Vacant Lands
Airborne Dust and Your Health

Activity

Plan:

Provide background information

- Facilitate discussion of air pollution in Pima County: identify major pollutants of concern (CO, O₃, PM, SO_x, NO_x) and their sources.
- Discuss health effects of air pollution utilizing healthy/unhealthy pigs lungs if acceptable by teacher.
- Open further discussion about Particulate Matter: what it is, utilizing size comparison chart, electron microscope images of fine particles, and filters.

Set up the scenario

- Spread out the cloth explaining that this represents an area of desert land in Tucson.
- Place blocks representing homes at the perimeter of three sides of the cloth. The area inside the residential border is a large plot of vacant land owned by a company located in Phoenix.
- Indicate that the fourth side borders Tucson Mountain Park (or other inaccessible land) that is fenced off to vehicles (although there is a break in the fence that riders squeeze through to ride on that land anyway).
- Place the toy quad and toy bicycle at different "homes," and then on the vacant land explaining that users of these vehicles ride on the vacant land without permission of

the landowner. Discuss the difference in the amount of dust raised from a BMX bicycle versus a quad.

Assign roles

- Separate students into five groups.
- Assign roles to groups by handing each the appropriate props and background information cards and copies: off-road vehicle riders, landowners, neighbors, Pima County DEQ, and Pima County Sheriff.

Facilitate discussion within separate groups

- Have one person from each group read the appropriate information card aloud to their group, while others follow along on copies that came attached to the card.
- Roam from group to group encouraging discussion linked to their role's influence on airborne dust issues.
- Encourage groups to identify major points they would like to address to the group in their assumed perspective, and try to find a reasonable solution to airborne dust issues. Have them write these ideas down on poster-size paper to share with the class.

Facilitate group discussion

- Taking turns, have each group discuss their perspective regarding off-road vehicle use of vacant land.
- Once each group has had the opportunity to present their points, open up the conversation to debate, making sure major points are discussed in pursuit of reasonable solutions.
- Summarize potential solutions and expand into actions the audience can use to reduce air pollution in general, and how to protect ourselves from air pollution.

Method of

Learning: Role-play, small group discussion, large group discussion, demonstration, lecture.

Assessment: Written evaluation by teacher assessing presenter, visual aids, and measuring learning by students.