Air Module Scenario (Exercises #1-5)

Purpose
To use a role-play to learn basic principals of epidemiology, and to explore the concept of environmental health, specifically with regards to air quality.

Overview
Students role-play an environmental consulting firm, with students becoming experts on a given aspect of air quality and human health. Each exercise develops the role-play further, emphasizing teamwork and peer education. A scenario is introduced and students use an inquiry-based learning module to generate questions, draft a research plan, and generate possible solutions.

Time
One two-hour block class period for each exercise and one possibly devoted to research with outside class group work.

Key Concepts
Man-made pollutants and natural processes affect air quality.
Young people are especially vulnerable to the health effects of poor air quality.
Asthma and respiratory ailments are worsened by poor air quality.
Collection of data and data analysis using mathematics, research and critical thinking can help us determine the extent of a problem in our community and to choose an appropriate response to the problem.

Skills
Generating questions
Making a research plan
Working in a team
Sharing information with others
Organizing research material
Presenting research findings
Calculating means
Graphing data
Designing interventions

Materials
Five exercises administered in order
Overhead projector
Access to the internet for students and teacher helpful

Facilitator Preparation
You will be acting as the supervisor of the students' environmental consulting firm, which they will create and name. The students should be broken up into four randomly assigned teams, one for each of the following subjects: Atmosphere, Outdoor Air, Indoor Air, and Human Health. You should be familiar with the AMBIENT Teacher’s Guide to Air Quality before starting the module.

Each exercise has a Teacher's Key providing guidance as to what direction the students need to be heading in order to proceed to the next step. If students go off on a tangent,

bring them back to the requirements of the firm's contract. The module is designed to alternate team discussion with whole class intergroup presentations.

Procedure/Student Assessment

6. After reading the **Scenario (#1)** which sets up the role-play and the **Contract** from the AMBIENT School Board, have students identify the problem in their own words, establish what they already know about asthma, and what they think they need to know to fulfill the requirements of the contract. Students will form four teams, Atmosphere, Outdoor Air, Indoor Air, and Human Health, and will specialize on research in that area. Students should adopt "roles" within their team based on their perceived strengths and interests. For instance, someone with a good computer at home might be the website search specialist, or a student who likes public speaking might offer to do the presentations to the class. Students should also name their consulting environmental company and even create a logo.

   Students should be assessed using the following questions:
   - Did students adopt the role-play in answering the worksheet/discussion questions?
   - Did students raise good questions about where their research needs to go?
   - Did the students identify their existing knowledge that might be useful?
   - Did the students form teams and assign themselves roles within their team?
   - Did the students finish with a clear idea about what steps need to be taken next?

7. Students will **Research (#2)** various aspects of the scenario in the four teams mentioned above. Each team will present their findings to the other teams, lead appropriate labs and answer questions. Topics for team research include:
   - *Atmosphere* -- Basic components of the atmosphere, how air moves.
   - *Outdoor Air* -- Main pollutants of outdoor air, sources, and effects.
   - *Indoor Air* -- Main outdoor air pollutants, sources, effects.
   - *Human Health* -- Physiology of respiration, most common respiratory ailments.

   Give the following presentation design components to each student team as a guide to their group presentations:
   - Decide what is important about their findings.
   - Design an overhead or power point presentation that summarizes the information (may need 2 or more sheets).
   - Practice and keep their presentation within the time allotted.
   - Each group member should take part in the presentation, even if just to read or explain one piece of the presentation.

   Assign points for the following components of the team presentation:
   - Is the overhead or powerpoint presentation easy to read?
   - Were pictures/maps/illustrations used?
   - Were proper environmental health terms used?
   - Was the presentation easy to understand?
   - Is each member actively taking part in the presentation?
   - Did the group report their source?
   - Could the group answer questions from the audience?

3. In the **"Our Community" Asthma Quiz (#3)**, students answer questions as they explore prevalence, expected rates, asthma facts and other aspects of the Miami-Dade asthma "picture".
4. The **School Survey (#4**) is an exercise that will walk students through the process of sampling or surveying a population to gather data. A sample survey is given to use or the students may design their own utilizing the concepts presented. Segment includes the tabulation and basic analysis of the survey findings. It also includes sample data if students are unable to actually carry out the survey in their own school. See School Survey cover sheet for details, assessment.
5. The **Final Report (#5**) can be the culminating experience of the module in which students present their findings to an audience which can include actual school board members, other classes, parents or local air quality officials. See the Final Report cover sheet for procedure. Assessment tools are given there and include fulfillment of the contract.