Air Quality Investigation

Needed Materials: Index cards (7.5 X 12.5 cm.) or empty photo slides or tag board (enough for each group to have at least 3 collection cards), magnifying glass, clear packing tape, rulers, 5 mm. grid paper, calculators, masking tape, string, or clothespins, scissors, microscope (optional).

Safety Rule: Do not climb trees or other structures to place your cards.

Procedure:

Student Information: The following information will provide you with the steps for setting up your air quality test. It is important to hold all variables constant except for those that are being manipulated. Constant (or controlled variables) would be such things as: the size of the collection space, the amount of time the experiment is conducted, the stickiness of the packing tape, etc. Manipulated (or independent) variables would be those things that we change to see if the response will be different, such as: location of the card, height of the card, weather on day of collection, etc. The responding (or dependent) variable for this experiment will be the number and variety of particulates you gather on your cardboard. NOTE: Temperature and wind are variables that will be difficult to control or intentionally manipulate in this experiment. However, from your experiments, you may be able to infer as to whether temperature or wind has any impact on the number and variety of particulates collected. The reporting form for this experiment is set up so that you can determine how many collecting boards you want to put out, where you want to place them, and what elevations you want to use. NOTE: Be sure to leave your collection boards out for a minimum of a twenty-four hour period.

Procedural Steps for Conducting the Investigation

- 1. Click on the “View Data” link at the Air Quality Investigation web page. Click on “View” in the blank sample listed on the chart. What comes up is the data collection sheet that will be used in this investigation. Print it and place it on your clipboard.
- 2. Begin by cutting a 3 cm. X 5 cm. rectangle out of the center of your index cards or tag board. Decide how you will measure the particulates collected on your collection cards. NOTE: If you have empty photo slides the hole is already made.
- 3. Place clear packing tape on one side of the card or slide so the sticky part is exposed through the hole.
- 4. Choose a location for your collection cards or slides that will not get a lot of human interference for a minimum of a twenty-four hour period.
- 5. Write your group's name and the location you where will be placing the card or slide, on the back of either the card or the slide.
- 6. Once you have chosen the location you will be placing the card or slide, decide how you will attach your card or slide to this location (tape, string or clothespins).
- 7. Attach the cards or slides to the three locations you have chosen in the schoolyard.
- 8. After a minimum of 24 hours return to your cards and take them down.
- 9. Place your 5 mm. grid paper on the non-sticky side of the card or slide so that it shows through the packing tape.
- 9. Using a microscope or magnifying glass, count and calculate the number of particulates in each 5 mm grid for a total area of 3cm².
- 9. Be sure to enter all of your collected data onto your printed data collection sheet.
- 10. After group and classroom discussions have occurred, login to enter your data online at the correct location. NOTE: Only numbers must be inserted into the spaces provided in order for your Excel spreadsheet to work properly.
- 11. Once all classroom data is submitted you can download all submitted Air Quality data and develop charts and graphs in Excel by following the general directions provided at "Downloading and Analyzing Collected Data Using an Excel Spreadsheet"