Lesson 3:

Making Environmental Decisions Through Data Analysis

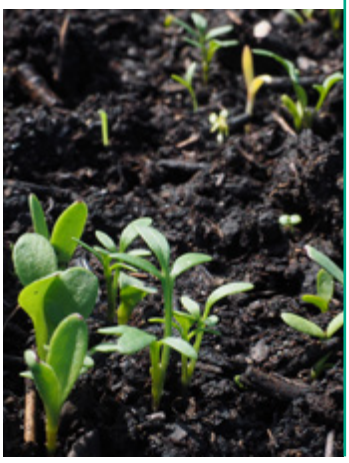
Grade Level: 9-12

Time: 55 Minutes

Vocabulary:
Data management, data analysis, data reporting, mean, median, mode.

Great Lakes Literacy Principles:

Principle 7
Concepts D, E, F



Summary:
Discuss the site water quality based on results from the data analysis activity. Students make conclusions about their data. Students learn how scientists use various communication strategies to communicate data to different groups and use data to make project-level decisions.

Objectives:
- Analyze data using simple statistics.
- Make conclusions about the environment using data.
- Describe different strategies scientists use to communicate data to the public.
- Explain how scientists use data to make project-level decisions.

Materials:
Results from data analysis, Scientific Data PowerPoint. An editable PowerPoint (.ppt) file can be found on www.greatlakesmud.org/education.html.

Procedure:
Using results from the data analysis, engage students in a discussion on making conclusions about water quality at the site. Give the presentation on data reporting and decision making. Students do data conclusions worksheet. Contact Illinois-Indiana Sea Grant if interested in having a guest speaker, such as a project scientist, visit the class. An example plan of work for the guest speaker is provided.

Assessment:
Data conclusions activity with grading sheet.

Example Plan of Work for Guest Speaker

Purpose and Background:
The objective of this guest speaker visit is to teach students about data management, data analysis, reporting data (including communicating it to the public), and using data to make project-level decisions. Use real-life examples and stories to engage the students in these topics. They will benefit from listening to "real-world scientists" speak about the process of each of these steps, which will validate each step's importance. Twenty-five minutes of time is recommended for the guest speaker, but that can be modified based on the teacher's need.

Agenda:

1. Introduce guest speakers
    a) Name, role, why you came to speak to the class

2. Guest speaker stories
    a) Use engaging stories and examples to answer each of these questions. Use as many applicable stories from the current environmental cleanup project as possible.
        i) Where did you go to school? What jobs did you have before this one?
        ii) A lot of responsibility comes with this role (problem solving, budgeting, etc.).
        iii) Is this job what you thought it was going to be?
        iv) What do you like about this job?
    b) Questions from the students

3. Deliver Scientific Data PowerPoint

4. Teacher overview of data analysis activity
    a) Mean, median, mode, outliers

5. Making Conclusions Using Data Worksheet

Timeframe: 55 Minutes

Name _____ **Date** ____/____/____

Use your data analyses and lab note observations to provide answers in complete sentences.

Part I: Synthesizing Data

What parameters were of high concern at location one?

Why do you think those parameters were of high concern?

What parameters were of high concern at location two?

Why do you think those parameters were of high concern?

Did results from location one vary from location two? How so? Why or why not?

Using what we have learned about what these tests mean, state how healthy the water body is. (Make sure you use information from both locations to make a conclusion.)

How can we as a school help to ensure that the water body continues to thrive after the remediation is done?

Part II: Reporting Data

How do scientists present data so that the public can understand the data?