Y-CITYSCI: A Youth-Led Citizen Science Network for Community Environmental Assessment
Environmental Assessment Curriculum: Lesson 12
Grade Level: Middle school
Duration: 1 hour

Data Analysis

Next Generation Science Standards

Science and Engineering Practices:
        4: Analyzing and Interpreting Data
        5: Using Mathematics and Computational Thinking

Crosscutting Concepts:
        Cause and Effect

Objectives

1. Students will implement the scientific process.
2. Students will organize and interpret their research project data.

Materials

- "Data Collection" sheets (completed from previous session)
- "Research Project Planning" sheets (completed from previous session)
- Laptop/tablet with Excel (1 per group)
- "Descriptive Statistics in Excel with Data Analysis Toolpak" [video](#)

Activities

Lecture: Put students into their groups and pass out laptops and Data Collection and Research Project Planning sheets. Have students open a spreadsheet program, like Excel, and explain that they will use this program analyze their data. Show students the "Descriptive Statistics in Excel with Data Analysis Toolpak" [video](#). Have them follow along with their laptops and periodically pause the video so students can have time to practice a skill or ask questions. (15 minutes)

Activity 1: Choose about five descriptive statistics categories that you would like the students to calculate such as: mean, median, mode, range, maximum, or minimum. Have the students input their data into the spreadsheet and calculate the statistics.

Students should then discuss what their data results mean, how these results help them make interpretations, and what can they say about their environment. How might their interpretations change with larger data sets? Do students think large data sets would follow that same patterns? (20 minutes)

Activity 2: Discuss the various ways data can be shared with others. This can be through tables, models, graphs, etc. Show the class how they can use the spreadsheet program to make tables and graphs. Have each group decide on a visual way to share their data on their presentation posters. Students should then create those models and save them to use during the next session. (20 minutes)

Discussion: Discuss what students think about the data organization and analysis process. What did they like or dislike about using the spreadsheet program, like Excel? What data visualization, like bar graphs or pie charts, are they familiar with or have encountered in their everyday life? Let them know that everything they have been working on over the past few sessions will come together during the next session when they begin to organize their research poster. (5 minutes)

Resources

An Intermediate Excel, Skills, Tips, and Tricks Tutorial [video](#).

An Excel Charts & Graphs: Learn the Basics for a Quick Start tutorial [video](#).