

**NIH SEPA Environmental Health Investigators
Measuring Skills and Tools Curriculum: Lesson 10
Grade Level: Middle
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 spreadsheet software like Microsoft Excel (1 per group)
- “Descriptive Statistics in Excel with Data Analysis Toolpak” [video](#) if using Excel.

Activities

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



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

Students should then discuss what information their data results convey about their research topic and how that information could help them make interpretations about their environment if larger data sets followed that same statistical patterns. (20 minutes)

Activity 2: Discuss the various ways students can share their data, analyses, and interpretations with others. Students might want to consider using tables, models, graphs, and other visualizations tools. 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 for their presentation posters. Students should then create those graphs and tables and save them to use during the next session. (20 minutes)

Discussion: Discuss what students think about data analysis. What did they like or dislike about using the spreadsheet program? What data tables and graphs 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](#).

