6.DA.1 Data and Analysis

> *The student will utilize computational tools to collect and organize data. (a) Select and use appropriate computational tools to collect data. (b) Organize data to make it easier to understand and use. (c) Clean data to remove and correct errors. (d) Analyze data sources for accuracy and reliability.*

Understanding the Standard

This standard asks students to use computers to collect and analyze data. The standard doesn't put any restrictions on what sorts of tools students use for this task, so students can use something as simple as an online form or something as complex as a system of sensors collecting environmental data. Most of the time, at this grade level, that data should end up in a spreadsheet so students can read the data, analyze it, and make visualizations of it. "Cleaning" data means removing or editing data that wouldn't work for analysis or visualization. For example, if you wanted to analyze peoples' zip codes as collected via an online form, you would want to remove "bad" data like invalid zip codes, blank responses, or correct zip codes that have been mis-typed. Data cleaning doesn't mean changing the results—it just means preparing the data for processing by a computer so the computer doesn't use bad information in its analysis or visualization.

Term	Definition
Data	Information about the world collected into a format that facilitates analysis
Data cleaning	Correcting or removing data points that would prevent a computer from accurately processing, analyzing, or visualizing the data

Prerequisite Knowledge

Before engaging with this standard, students should be able to define "data" and identify ways people use computers to collect it.

Integration Opportunities

Science 6.1b Take metric measurements using appropriate tools to collect and organize data. Evaluate the accuracy of various methods for collecting data.

Physical Education 6.3a Track fitness data related to a SMART goal and maintain a log of activities inside and outside of school related to this goal. Compile data to ensure accuracy and measure goal progress.

Math 6.PS.1 Use a computational tool to collect and organize data for a question of interest. Then create a circle graph to visualize the data. Reflect on the accuracy and reliability of data sources.

Summary of a Lesson

Have students come up with a research question about the student body at their school that can be answered by collecting data. Examples include "how much time do people spend on homework?" or "how much time do students use screens each week?". Have students design a survey to administer to the student body with questions that prompt students to provide data addressing their research question. Then, have students work together to review responses and find examples of "bad" data to remove. The nature of this "bad" data will vary depending on the questions students ask, but common issues include people responding with text instead of a number, people making spelling mistakes in their responses, or people leaving some questions blank. Have students "clean" the data, then demonstrate how to create visualizations of their data using spreadsheet tools. Consult information about your specific spreadsheet software for details on how to accomplish this task. Have students use their visualization to draw conclusions about their research question (e.g., "students use their screens too much during the week").

Note: This lesson summary also aligns to 6.DA.2 and 6.DA.3