

PS: K-8 Engagement Activities - Data



Exploration: K-8 Problem Solving - Data



Tools Required: None



Pre-requisites : None

This exploration provides an introduction to the first of three key activity categories in K-8 CS: data. Each of the other two categories (grid work, and language and thought precision) will be considered in turn, with an accompanying reflection. A summarizing project completes the problem solving module.

Background:

Note that a school child's first formal exposure to data comes in the form of pre-ordered sets: the number line and the alphabet. These sets permit one, and only one, organizing principle: the "order" of numbers on a number line cannot be changed, neither can the order of letters in the alphabet. While unintended, this early exposure to data sets can give the impression that all data sets permit only one (correct) organizing principle and that data sets are more learned than creatively discovered. Take the opportunity to teach the creativity and joy of discovery in science by providing practice in data set organization through activities such as these:

1. Provide students or student groups with manipulatives of multiple shapes, colors, sizes and functions. Using a timer and a sorting tray, have the students re-sort the manipulatives multiple times, based on different attributes. As a final sort, have elbow partners invent an organizing principle and share it with the class. The same activity can be performed in higher grade bands using books (sort by size, author, title, color, etc.)
2. Have students sort themselves in two ways: alphabetical order and then by height, and then lead a discussion on which approach was better. (Students should realize that this depends on purpose--calling attendance or creating a basketball team, etc..)
3. Work data organization into daily classroom routine: "Today, all the people with red in your outfit line up first in the lunch line." Let students choose the organizing principle of the day.

Reflection:

Step 1: **Browse** this article about the [history of the Periodic Chart](https://inchemistry.acs.org/content/inchemistry/en/atomic-news/assembling-the-periodic-table.html) (<https://inchemistry.acs.org/content/inchemistry/en/atomic-news/assembling-the-periodic-table.html>).

Read comprehensively enough to appreciate this quote taken from the article:

"The road to our modern-day periodic table was winding, full of dead ends and wrong turns. It required numerous discoveries, scientists, and experiments, as well as numerous failures and triumphs. It was, essentially, typical of science. Although we like to think of science evolving through lone geniuses like Mendeleev vaulting us toward progress, the reality of science is that it's messy, requires extensive collaboration, builds on the work of others, and revises hypotheses when new information comes to light. Mendeleev, Meyer, and the others were indeed incredible scientists, not because they figured everything out themselves, but because they were fully enmeshed in the illustrious enterprise we call science."

Step 2: **Reflect** on how, in your teaching practice, you might strengthen how creativity, discovery, failure, collaboration, and cogent communication are part of your pedagogy around data.