

Analyzing and Interpreting Scientific Data With DataClassroom

Graphing as the gateway to data analysis and statistics

Welcome!

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Joshua Rosenberg



Aaron Reedy



DataClassroom is a web-app to teach data skills in grades 6-12 *start recording

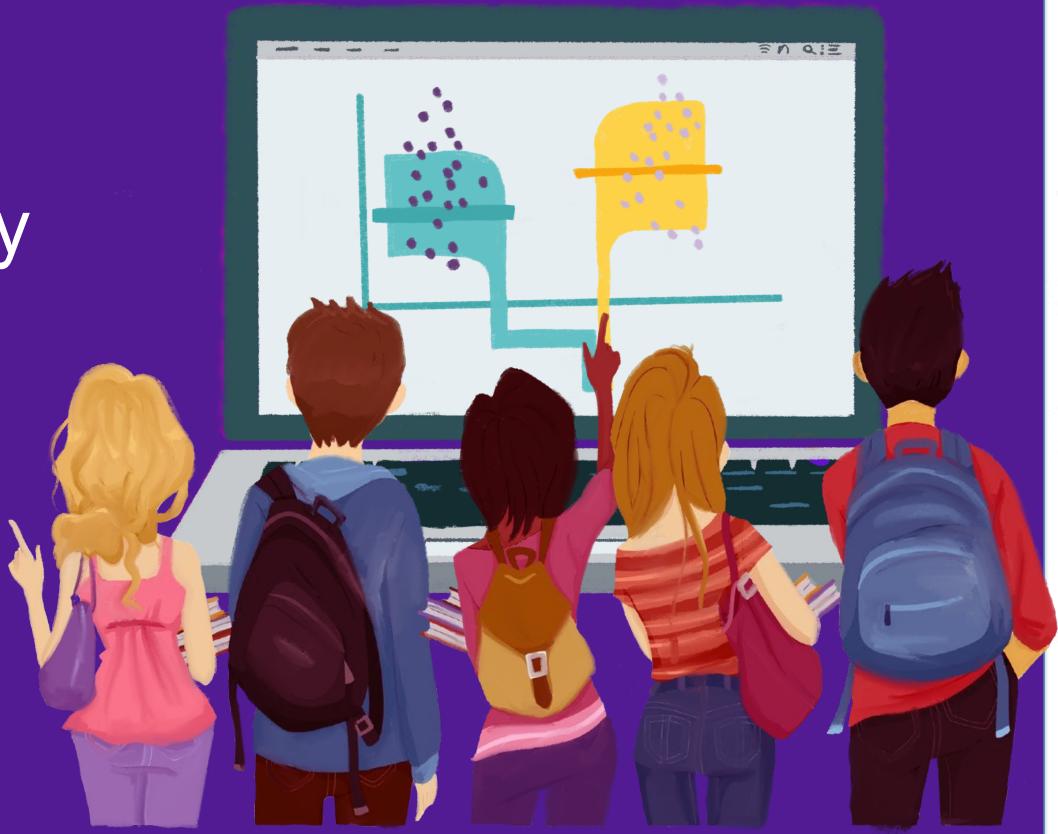
Let's start (briefly!) in break out rooms (5 min.); **please type into the chat what content area you teach**

Starting with whomever slept the *most* last night . . .

- What is **one thing that is exciting to you** about your students analyzing scientific data in your class?
- What is **one challenge** related to analyzing data you've experienced?

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...but first some backstory



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 Data
Classroom

#1 Begin with graphing

Strategy for graphing as a gateway to data analysis and statistics

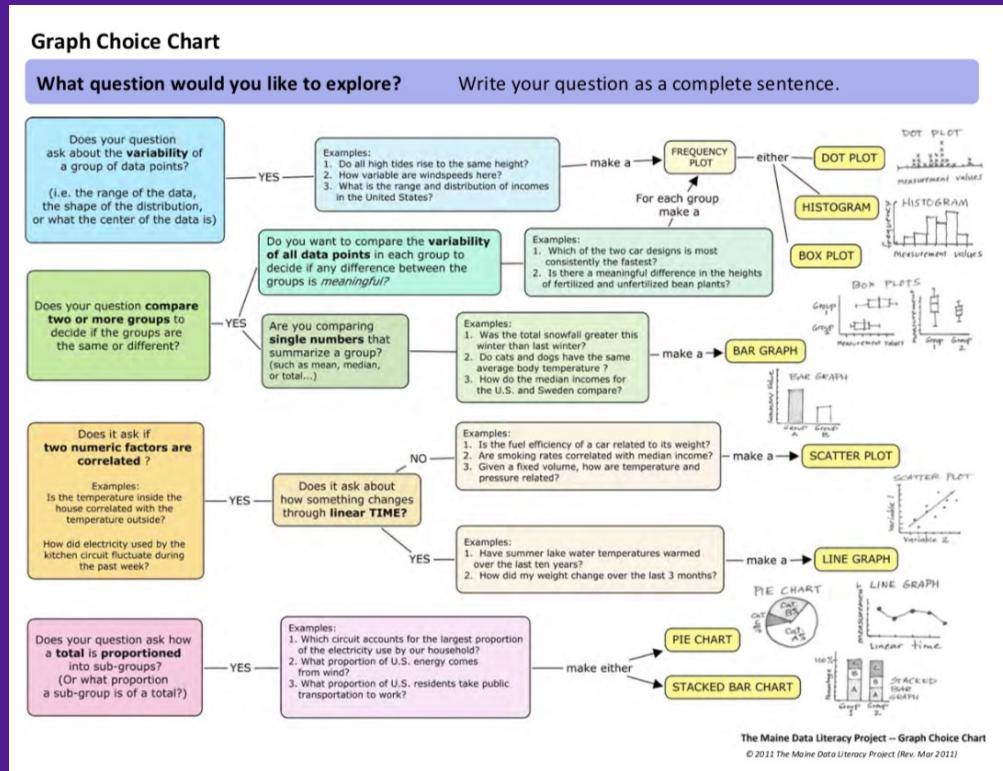
#2 Focus on the question

Strategy for graphing as a gateway to data analysis and statistics

#3 Move on to more advanced analyses through graphs

Strategy for graphing as a gateway to data analysis and statistics

Inspiration for focusing on the question



Webber, H., Nelson, S. J., Weatherbee, R., Zoellick, B., & Schauffler, M. (2014). The graph choice chart. *The Science Teacher*

⚡ Graph Wizard: Helping you select how to visualize your data



Proportions

Do you want to show how data are distributed among different categories?

E.g. what proportion is a category of a total?

Examples:

- How many coin flips are heads and how many are tails?
- What proportion of participants are female?
- How many students are athletes vs non-athletes?

Yes

Change over time

Do you want to show how something changes over time?

Or maybe how more than one thing changes over time?

Examples:

- Have sea temperatures changed over the last 50 years?
- How is income trending for those with and without a high school diploma?
- How does a car's speed increase as it rolls down a ramp?

Yes

Variability

Do you want to show the variation or shape of the data?

E.g. the range, shape of the distribution, or the center (mean or median) of the data.

Examples:

- What is the distribution of household income in the US?
- What is the range of salaries in the NBA?
- What is the average height of all students measured?

Yes

Comparing groups

Do you want to compare two or more groups of numerical measurements?

Are the means of the groups different? Is the shape of the data different for each group?

Examples:

- Do beans grow taller if fertilized?
- Were exam scores different between three groups?
- Does a drug have a greater effect than placebo?

Yes

Relationship

Do you want to show a relationship between two numeric variables?

One might cause the other, they might be correlated, or there might be no relation.

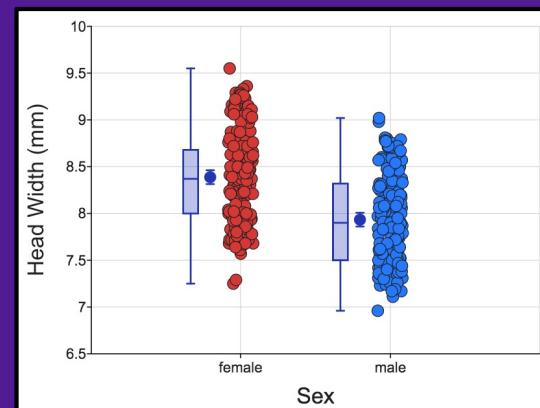
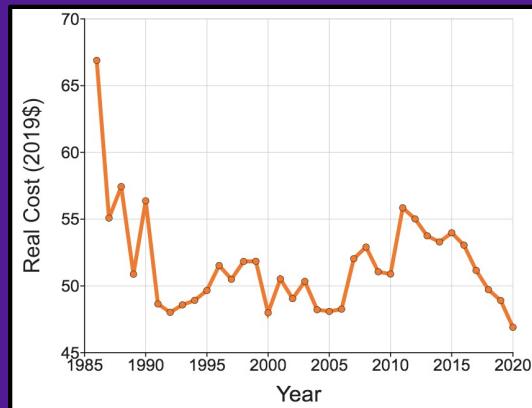
Examples:

- Is there a relationship between sea temperatures and levels of atmospheric CO₂?
- Does age partially predict an individual's honesty score?
- Is a country's GDP related to its plastic production?

Yes

Graph Wizard in DataClassroom

Let's work with two examples



Examples for graphing as a gateway to data analysis and statistics

Back in the same break out rooms we were in earlier, let's discuss two questions

Jamboard #1: What thoughts, reactions, or questions do you have about the idea that graphing can serve as a gateway to data analysis and statistics? Feel free to explore a bit!

Jamboard #2: What is one plan you have for analyzing and interpreting scientific data in your class over the next year?

[Link](#)

We'll spend 10 minutes in break out rooms!

Joshua Rosenberg



<https://joshuamrosenberg.com>; jmrosenberg@utk.edu



Aaron Reedy



<https://dataclassroom.com>; aaron@dataclassroom.com



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