Using Data Science to Tell Stories in the Elementary Classroom

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I WAS TOLD THAT
I'D BE DOING FUN DATA SCIENCE THINGS
makeameme.org

Session Purpose

- Gain a brief understanding of what data science is and why students need to be data literate.
- Introduction to data talks.
- Consider the statistical problem-solving process as a guideline for instruction.
- Learn a framework for creating data-centered tasks for students.
- Leave here with a data centered task you can use when you are back in your classroom.

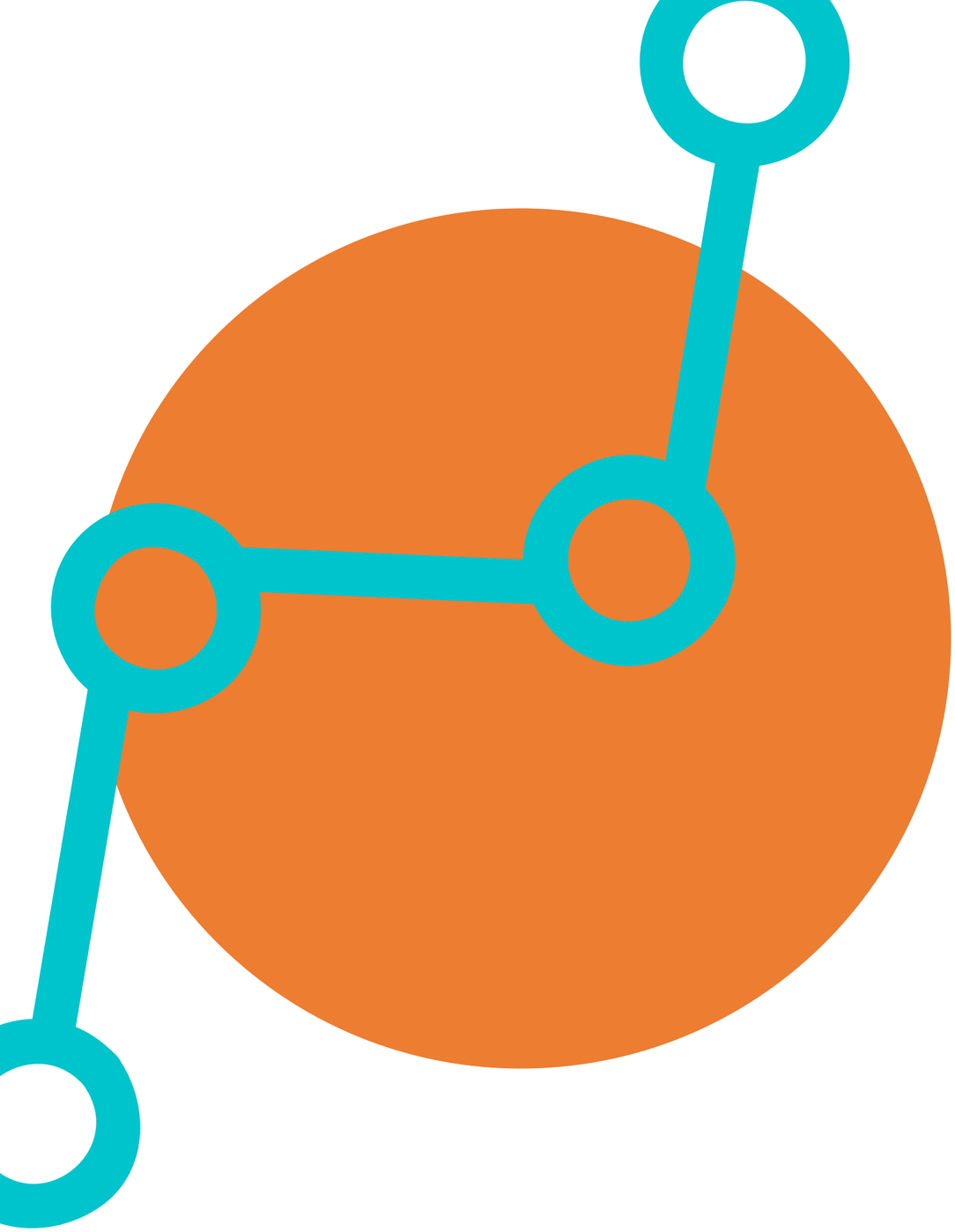
Ice Breaker: Data Detective

Reflect on a recent personal experience where you encountered data in your daily life.

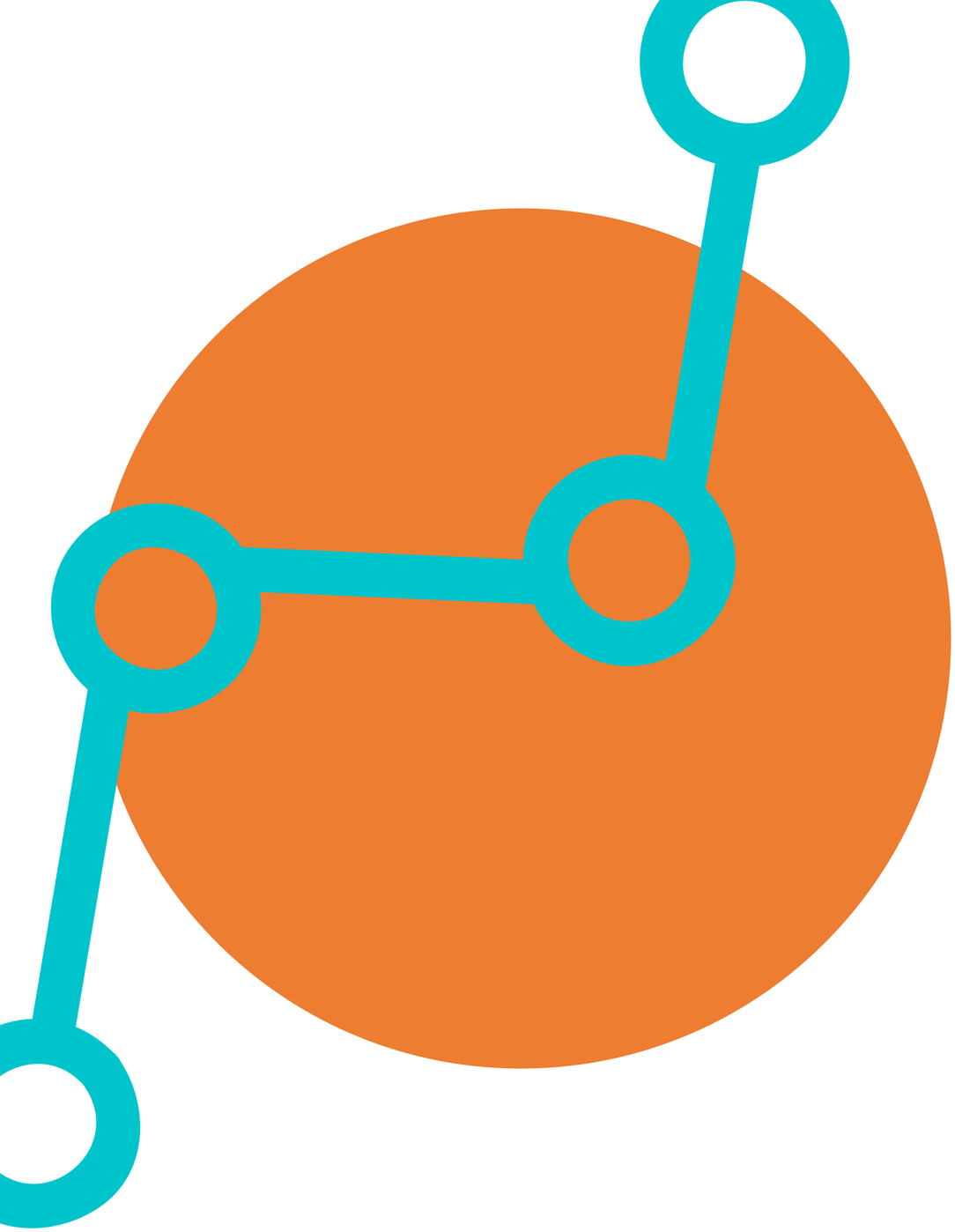
This experience could be something simple in your personal or professional life. Write a brief description of this experience on a sticky note.

Briefly share your experiences with a partner.

Discuss why you found this data relevant or interesting.



Who would like to share their experiences with the whole group?



What can we say about data here?

Just as you've encountered data in your everyday lives, you will explore how to engage elementary students with data in the classroom during the session.

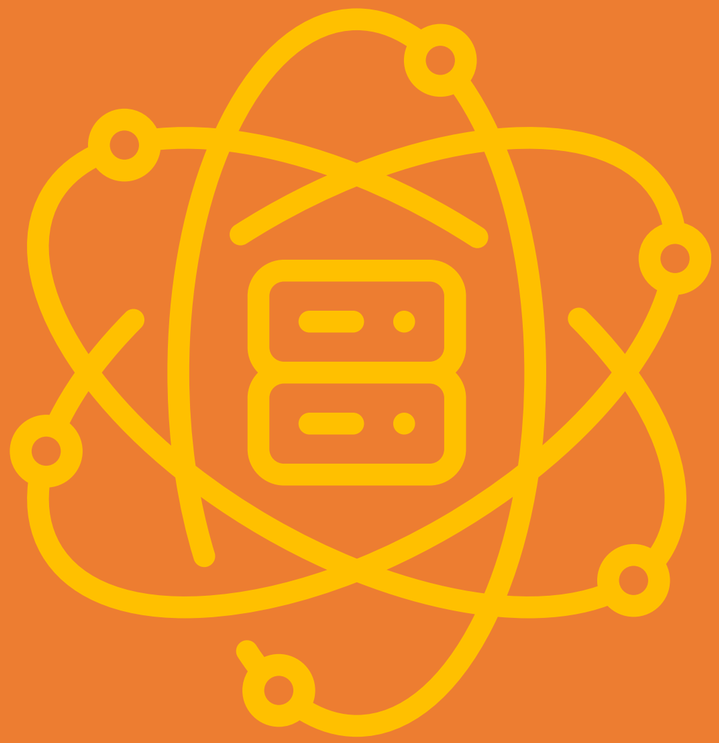

42
26
BINGO
15
83
4

What is Data Science?

Using what you know, at your table, come to a consensus of what you think data science is. Create an agreed upon definition.

What is Data Science?

Data science is the study of collecting, analyzing, and interpreting large sets of data to uncover insights, patterns, and trends. The goal of data science is to make better choices by using data to analyze a situation.



What is Data Science?

Data Literacy (CA Math Framework, 2023):
the ability to ask and answer real-world questions from large and small data sets through an inquiry process, with consideration of ethical use of data. It is based on core practical and creative skills, with the ability to extend knowledge of specialist data handling skills according to goals. These include the abilities to select, clean, analyze, visualize, critique, and interpret data, as well as to communicate stories from data and use data as part of a design process.

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Why Data Science?

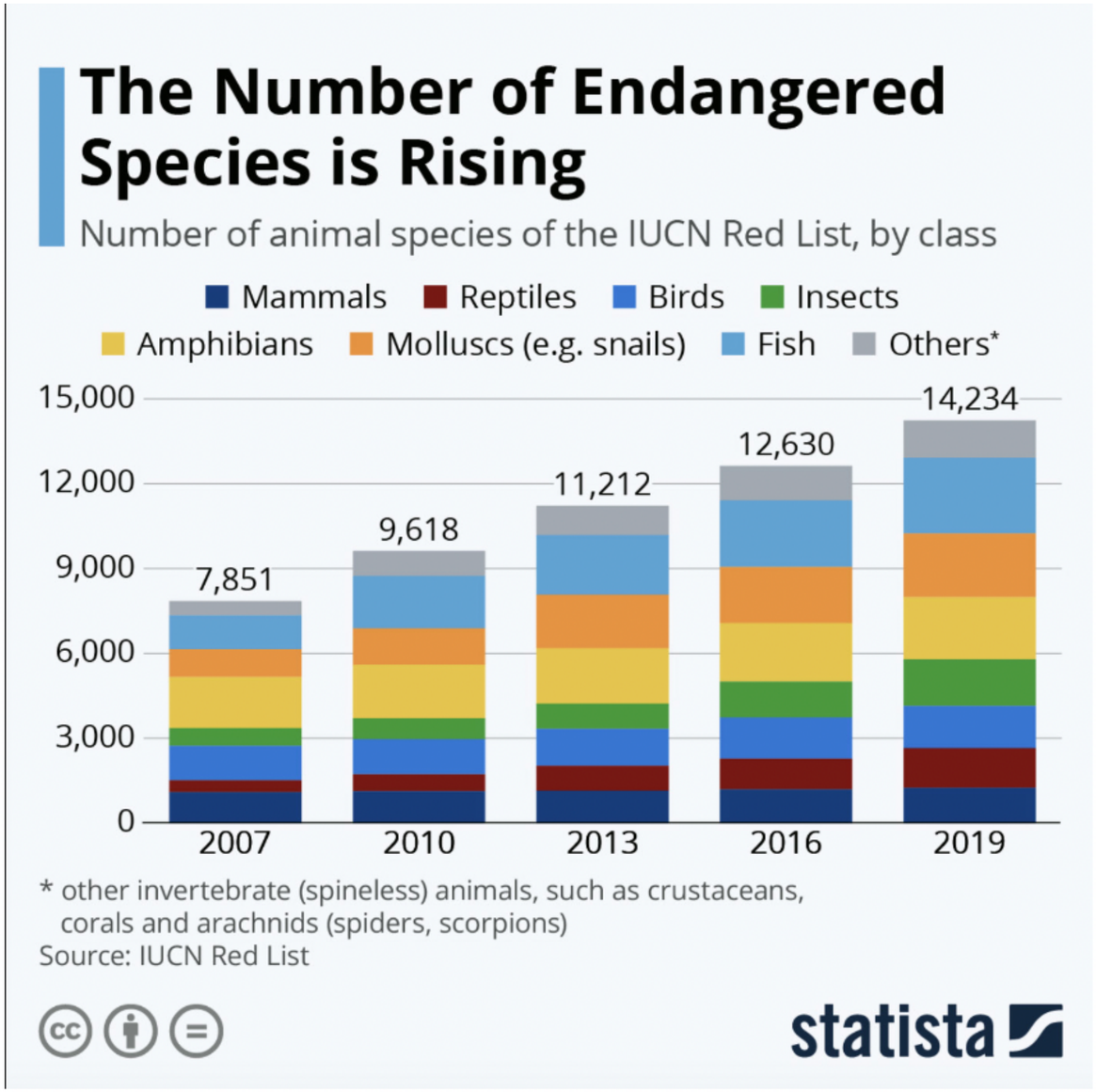
Students should have equitable access to data literacy and introductory data science at the K–12 level to facilitate equitable participation in a data-driven world as adults.

Why Data Science?

Because we want to facilitate equitable participation in a data-driven world as adults, students should have equitable access to data literacy and introductory data science at the K–12 level

Data investigation can support teachers as they seek to create climates of belonging for students, inviting them to investigate real data that is likely relevant to their lives. This meaningful engagement can create opportunities for students to develop self-confidence and self-efficacy with mathematics.

Uncovering Patterns
Making Predictions
Solving Complex Problems



https://www.statista.com/chart/17122/number-of-threatened-species-red-list/

What is a Data Talk?

Please feel free to share out:

- Have you ever done a data talk?
- What was your experience like?
- What did the students do?
- How was it useful?
- Where did you find the data visualization that you used?

What is a Data Talk?

About three years ago, YouCubed came up with the brilliant idea of **DATA TALKS**!

Data talks are classroom discussions lasting approximately 5 to 10 minutes, aimed at fostering students' data literacy. This educational approach closely resembles the structure of number talks but centers on data visuals instead of numerical figures. During a data talk, students are presented with a data visualization and are encouraged to share their points of interest and curiosity.

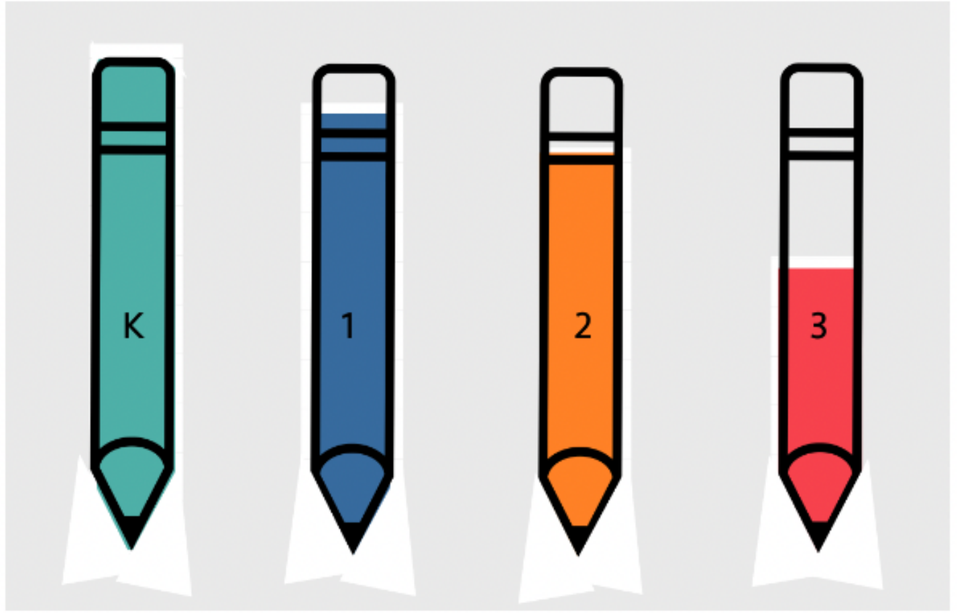
What is a Data Talk?

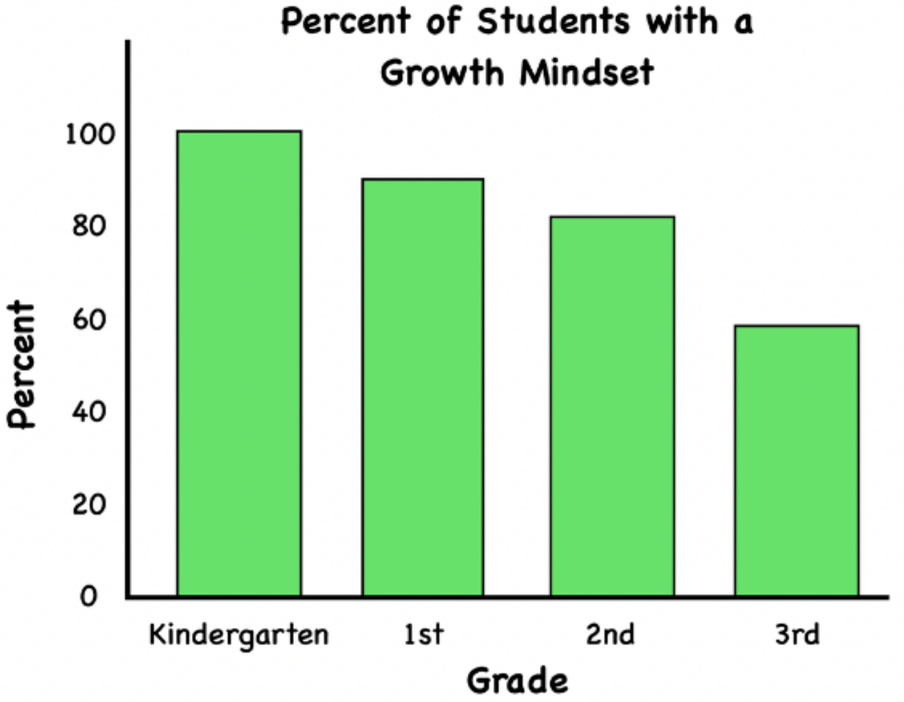
youcubed®

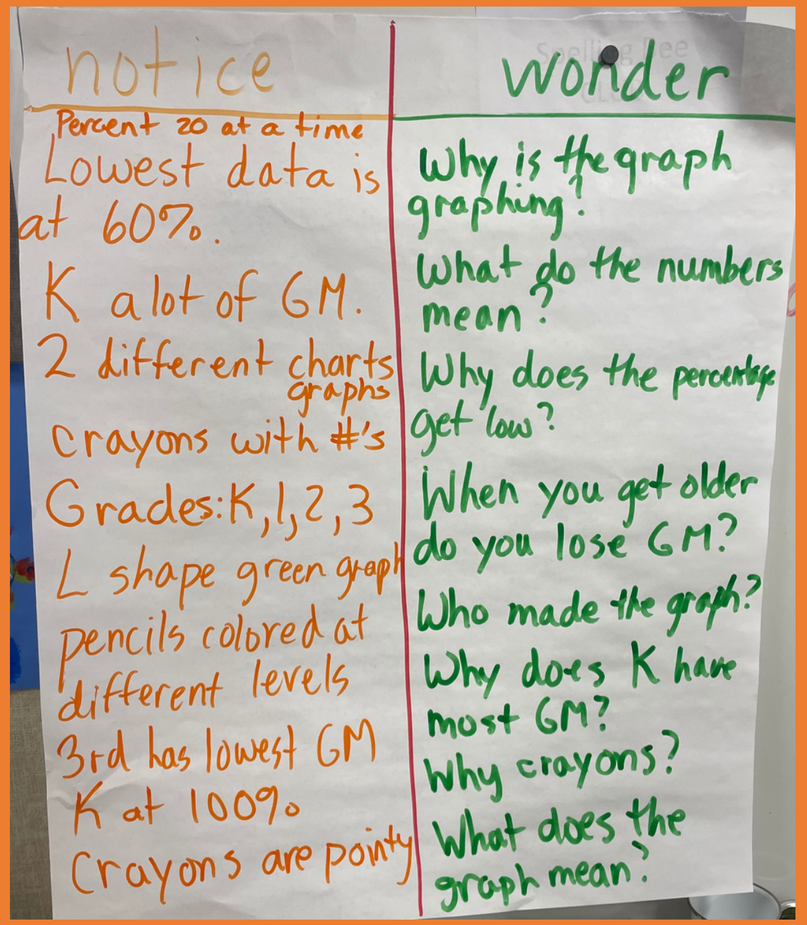
The primary objective of data talks is to **ignite students' curiosity**, prompt them to **ask questions**, and equip them with the skills to **comprehend and interpret** the data-rich environment that surrounds them in their daily lives.

Youcubed Data Talk
Growth Mindset

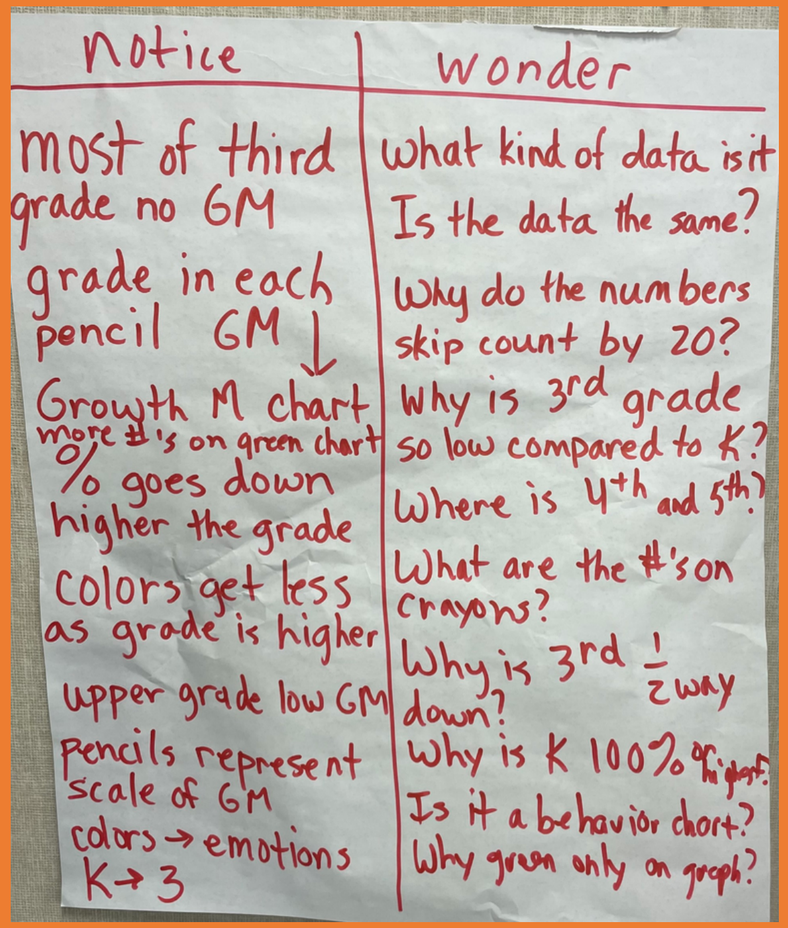
What do you notice?
What do you wonder?
What is going on in this data visualization?



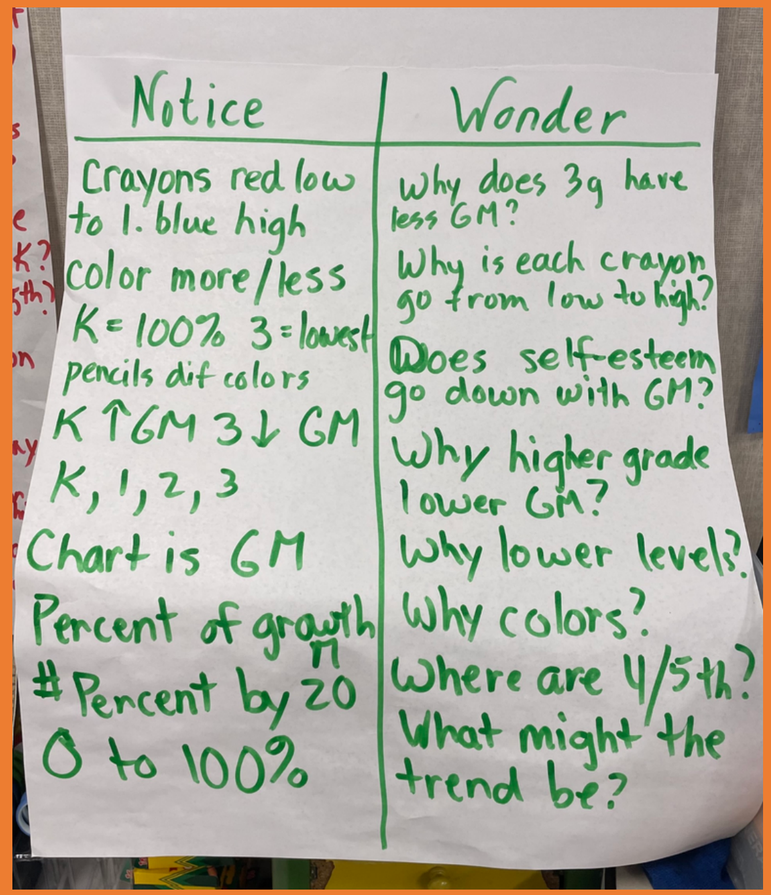




notice	wonder
Percent 20 at a time Lowest data is at 60%. K a lot of GM. 2 different charts graphs Crayons with #'s Grades: K, 1, 2, 3 L shape green graph pencils colored at different levels 3rd has lowest GM K at 100% Crayons are pointy	Why is the graph graphing? What do the numbers mean? Why does the percentage get low? When you get older do you lose GM? Who made the graph? Why does K have most GM? Why crayons? What does the graph mean?



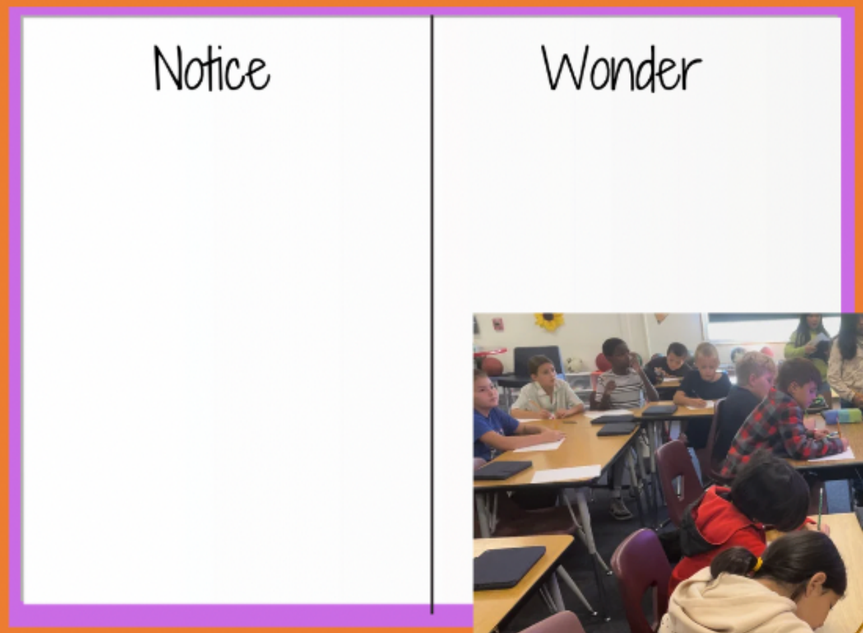
notice	wonder
most of third grade no GM grade in each pencil GM ↓ Growth M chart more #'s on green chart % goes down higher the grade colors get less as grade is higher upper grade low GM pencils represent scale of GM colors → emotions K → 3	What kind of data is it Is the data the same? Why do the numbers skip count by 20? Why is 3rd grade so low compared to K? Where is 4th and 5th? What are the #'s on crayons? Why is 3rd ↓ 2 way down? Why is K 100% of highest? Is it a behavior chart? Why green only on graph?

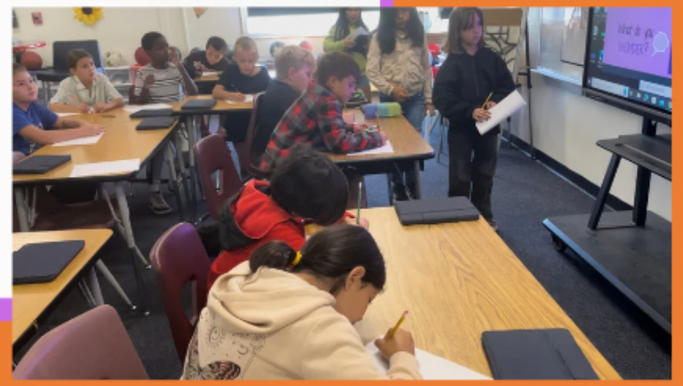


Notice	Wonder
Crayons red low to 1. blue high color more/less K = 100% 3 = lowest pencils dif colors K ↑ GM 3 ↓ GM K, 1, 2, 3 Chart is GM Percent of growth M # Percent by 20 0 to 100%	Why does 3g have less GM? Why is each crayon go from low to high? Does self-esteem go down with GM? Why higher grade lower GM? Why lower levels? Why colors? Where are 4/5th? What might the trend be?

Two Options:

Think/Write/Pair/Share





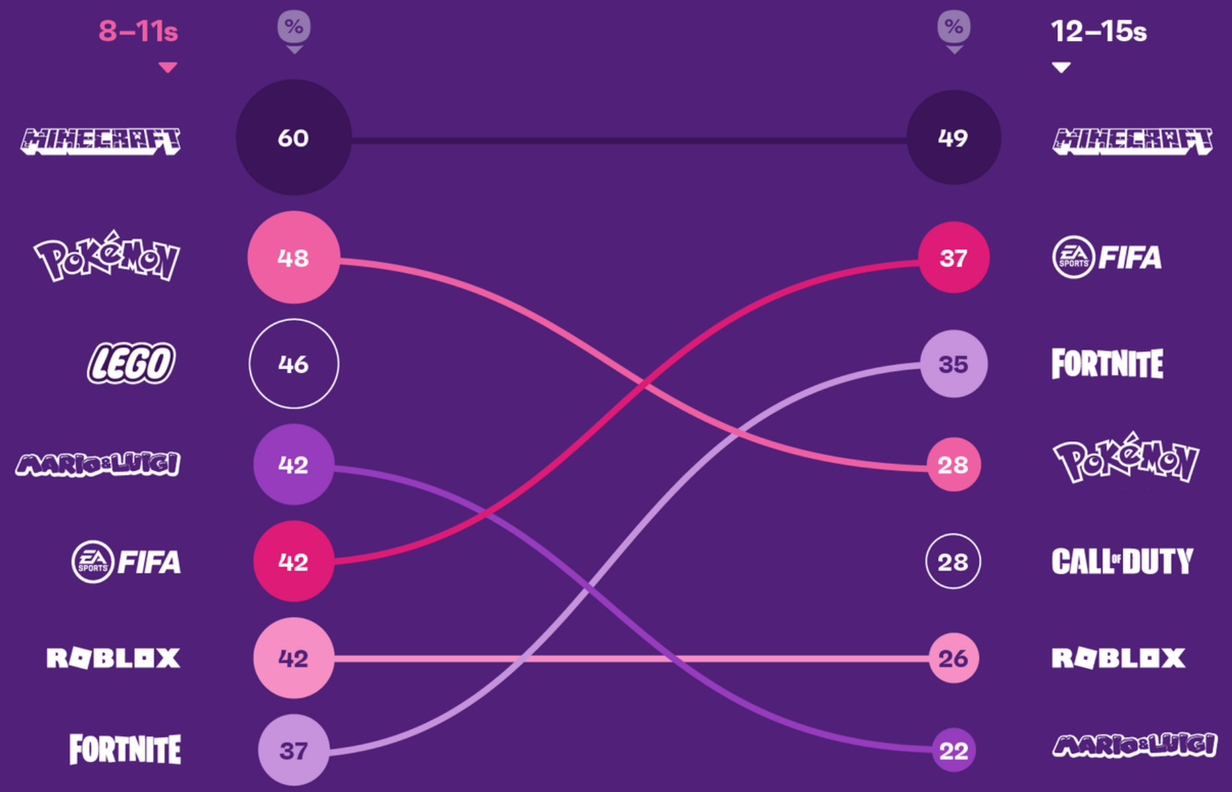
- Takes a little longer
- Good to use when establishing the routine

Think/Pair/Share

- Routine can be finished in 5-10 minutes

Top games titles: building, creating, connecting

% of gamers who play these games/have played these in the last month



? Have you ever played these games? (8–11 Only) /
Have you played any of the games listed below in the last month? (12–15 Only)

GWI Kids Q1 2021 13,114 kids who play video games aged 8–15

Aleenah

wonder

- I wonder why MineCraft is still on top for 12-15 year Olds
- I wonder when this was madr because the list might of changed to something differe.nt
- I wonder why Mario and Luigi got down low.

notice

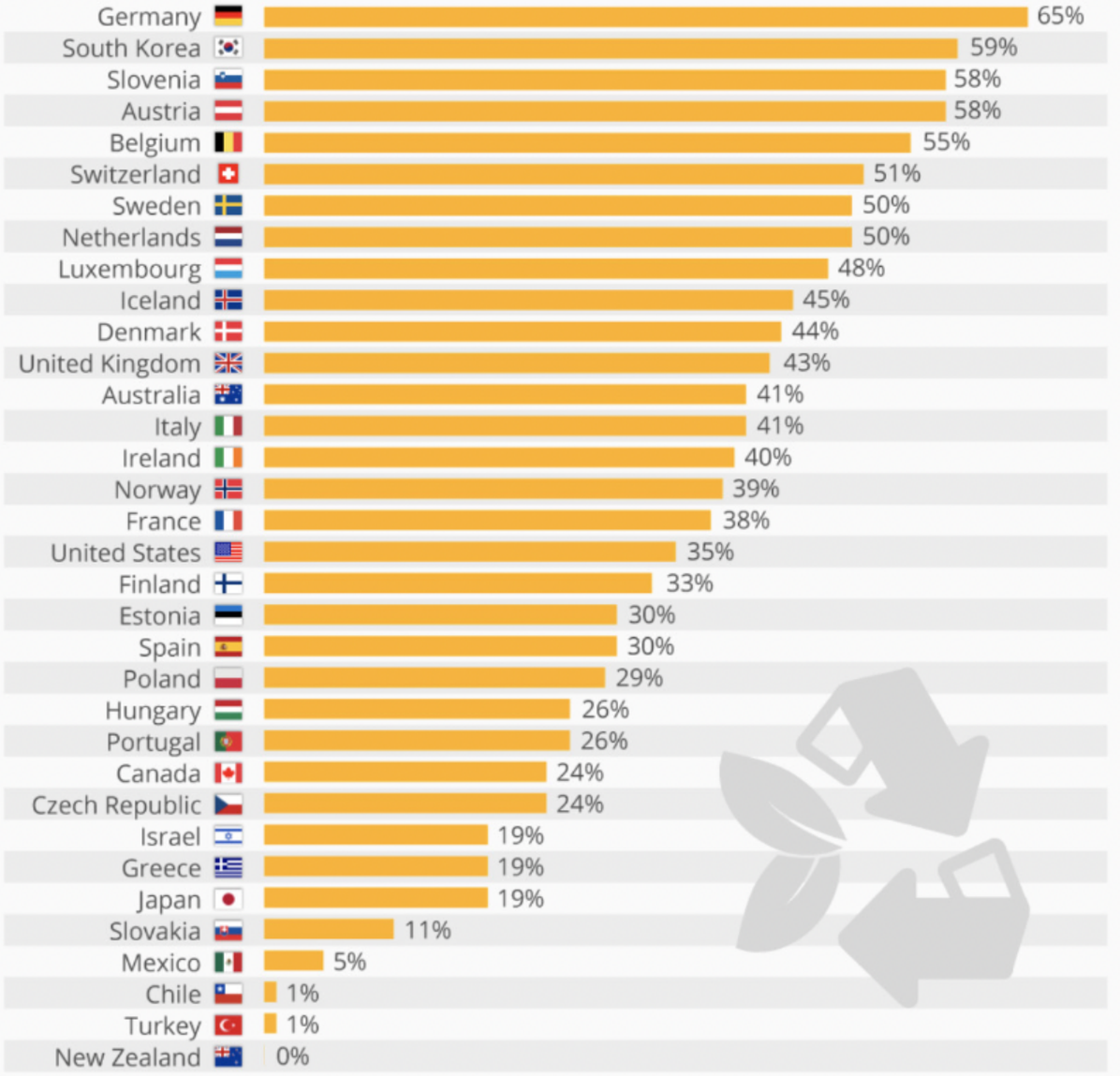
- different shades of purple and pink.
- video games; lines going up and down.
- the sizes of the circles are different.

Notice

The bigger numbers have bigger circles. Like (22) (60) see how 22s circle is small. And 60's is bigger. cause its a bigger number.

The Countries Winning The Recycling Race

Recycled & composted waste as a share of total municipal waste in OECD countries (2013)



Notice

- flags.
- numbers.
- colors.
- 35 flags.
- letters.
- words.
- Germany is the best at recycling.
- The chart was made in 2013.
- The chart is about countries recycling.

Wonder

- why is Germany so huge on the list?
- why is New Zealand on the botom of the list?
- why did they do a recycling race?
- why was this made
- I wonder what OECD mean.
- why did they choses these countries?
- what is statista

Data Tells a Story

Data Storytelling Challenge

Challenge Instructions:

1. Each table has number. Scan the QR code with your number.
2. Examine and analyze the data.
3. Create a compelling story or narrative using the provided data.
4. Prepare to share your data story within 5-8 minutes.

1

2

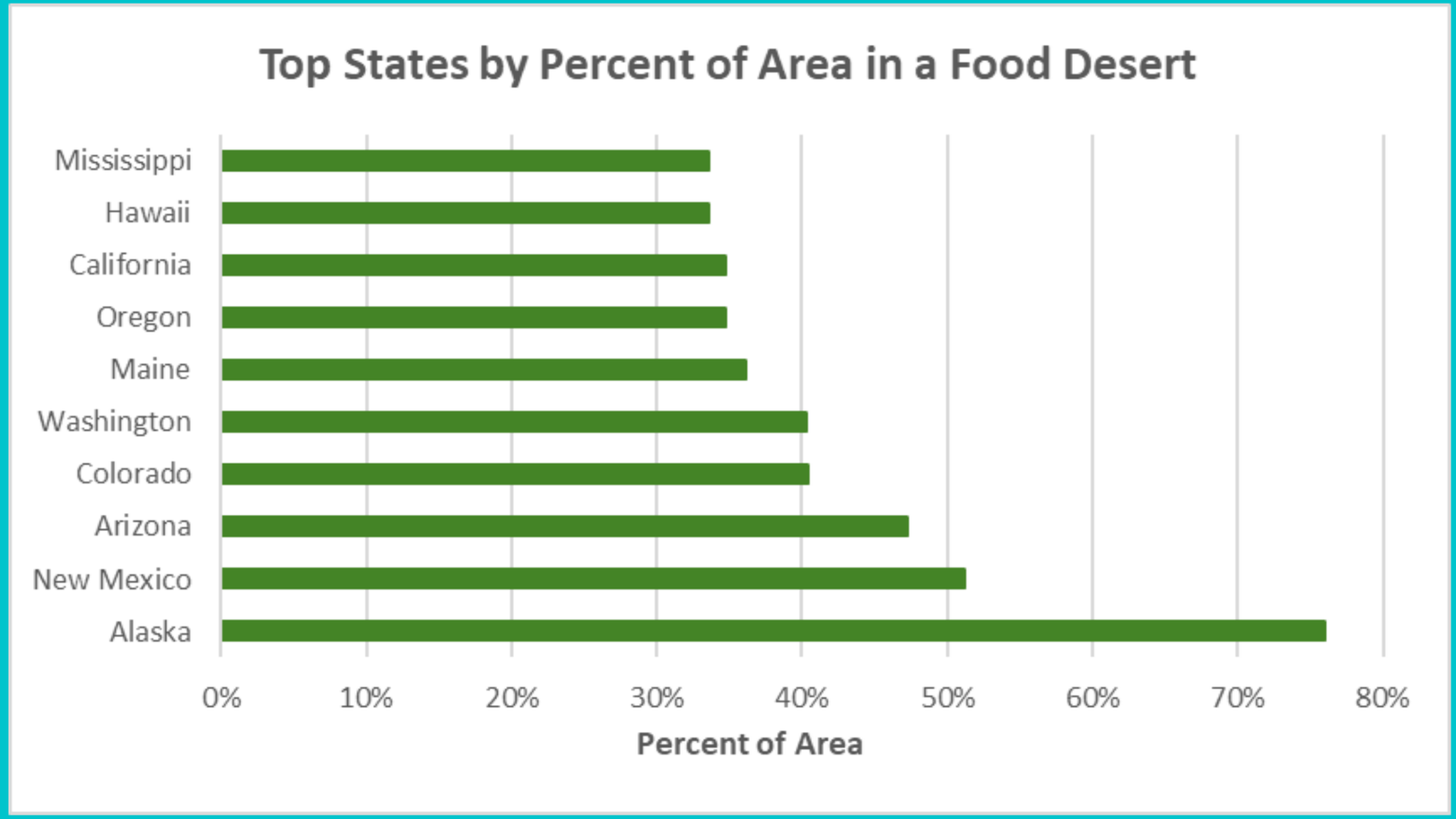
3

4

5

Say, Mean, Matter

- What does this say?
- What does it mean?
- Why does this matter?
- What story is being told?
- What learning might occur here?



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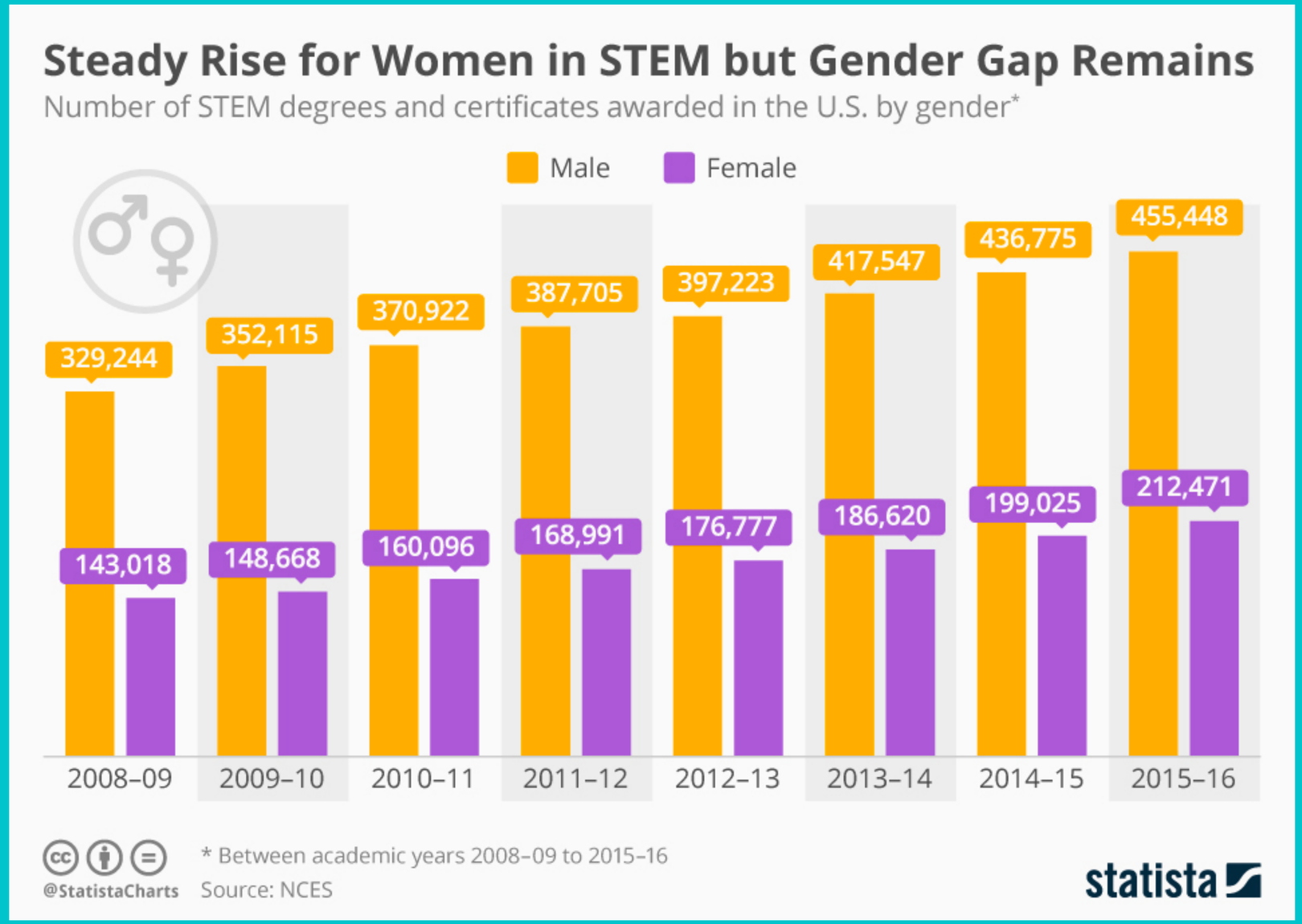

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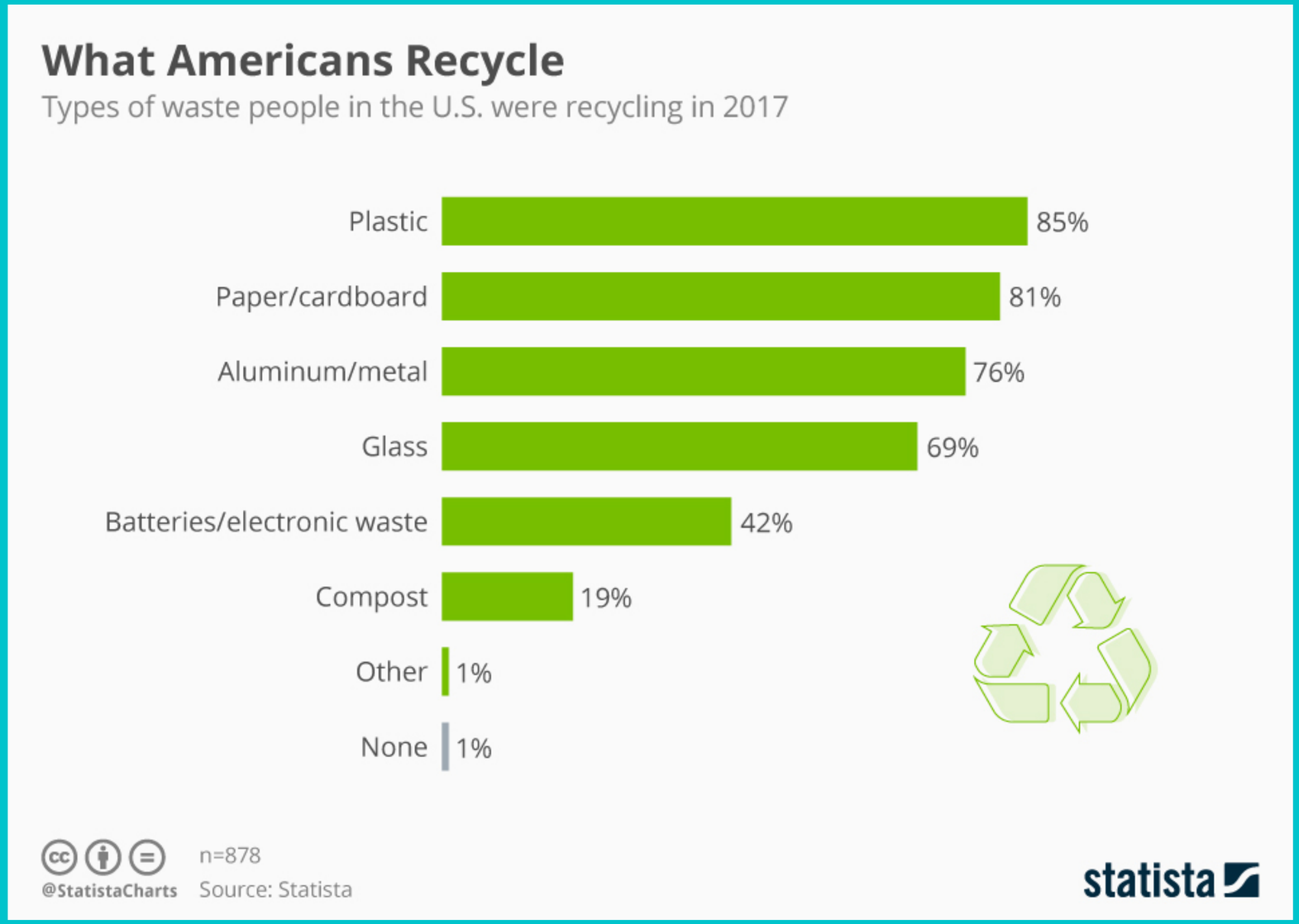

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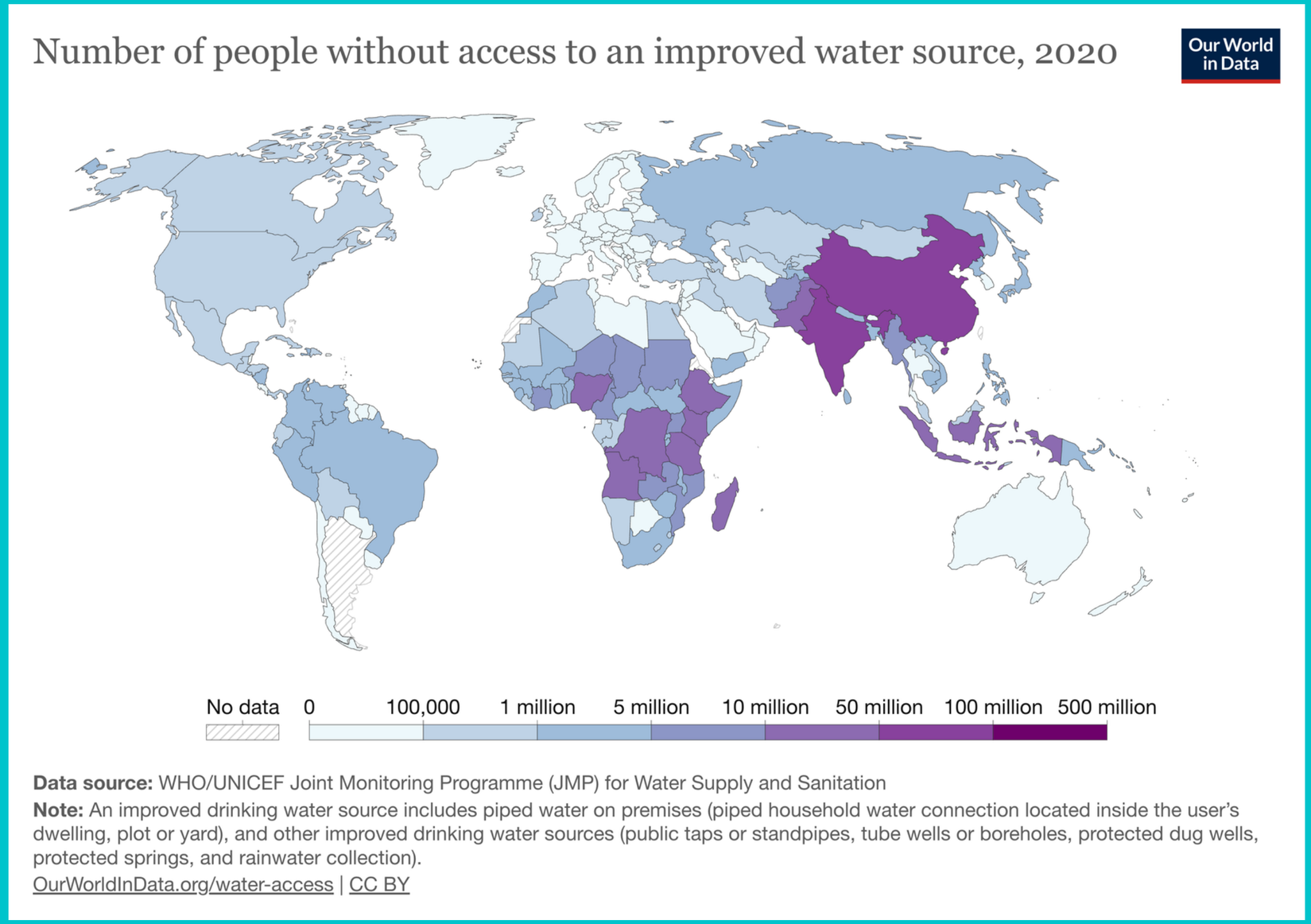

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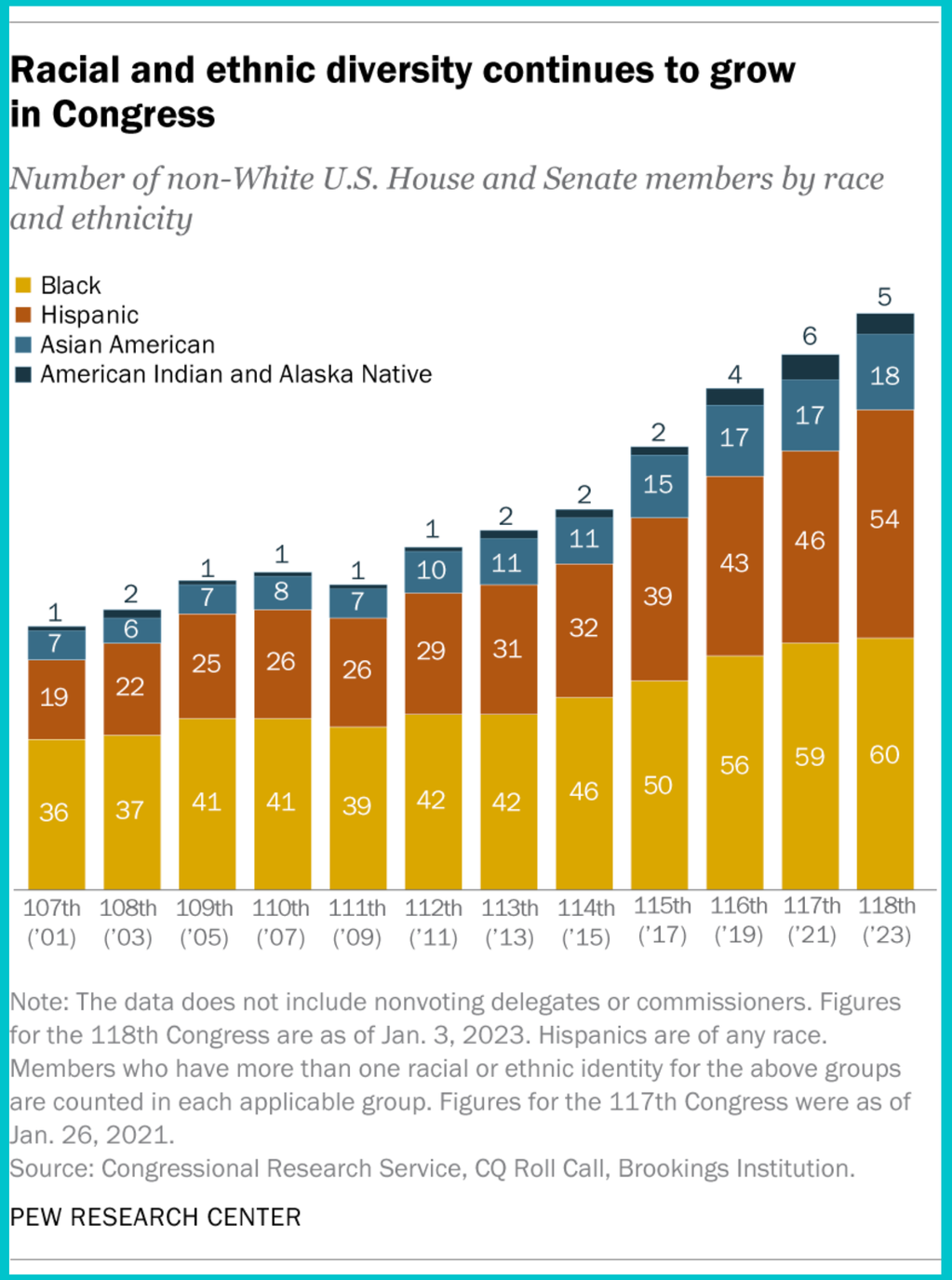
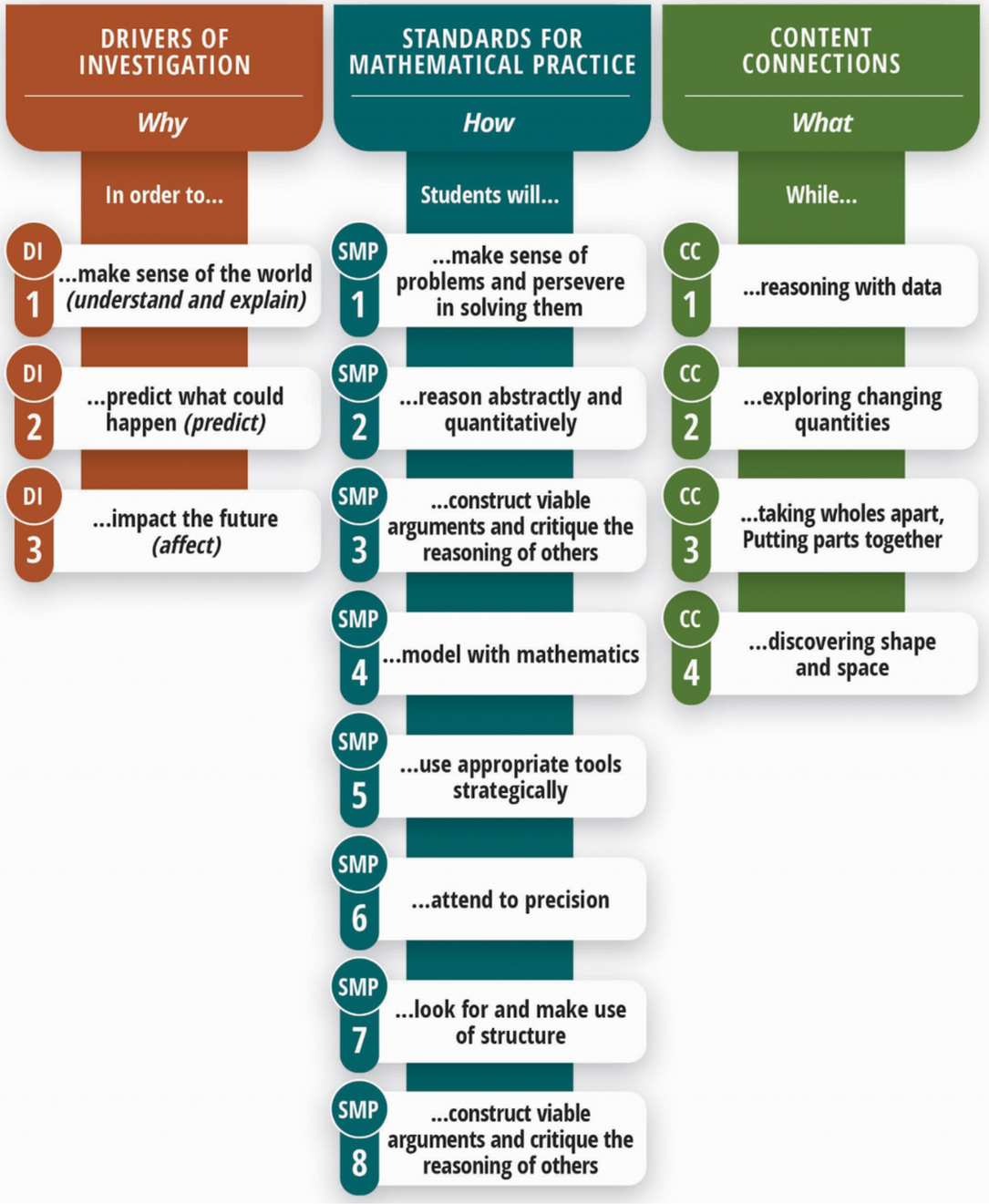


Framework for Creating Tasks: DI's, CC's and SMP's

In addition to the Standard for Mathematical Practice, the newly adopted CA Math Framework adds new components that are useful for planning tasks:

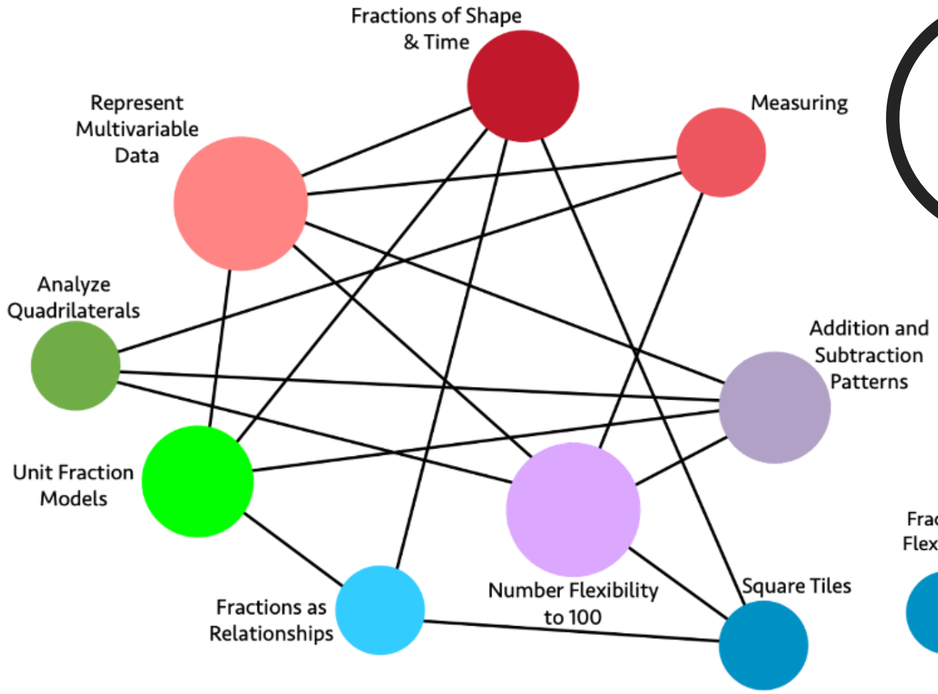
- Drivers of Investigation (the ***WHY***)
- Content Connections (the ***WHAT***)

This can be used as a framework to plan and create tasks.

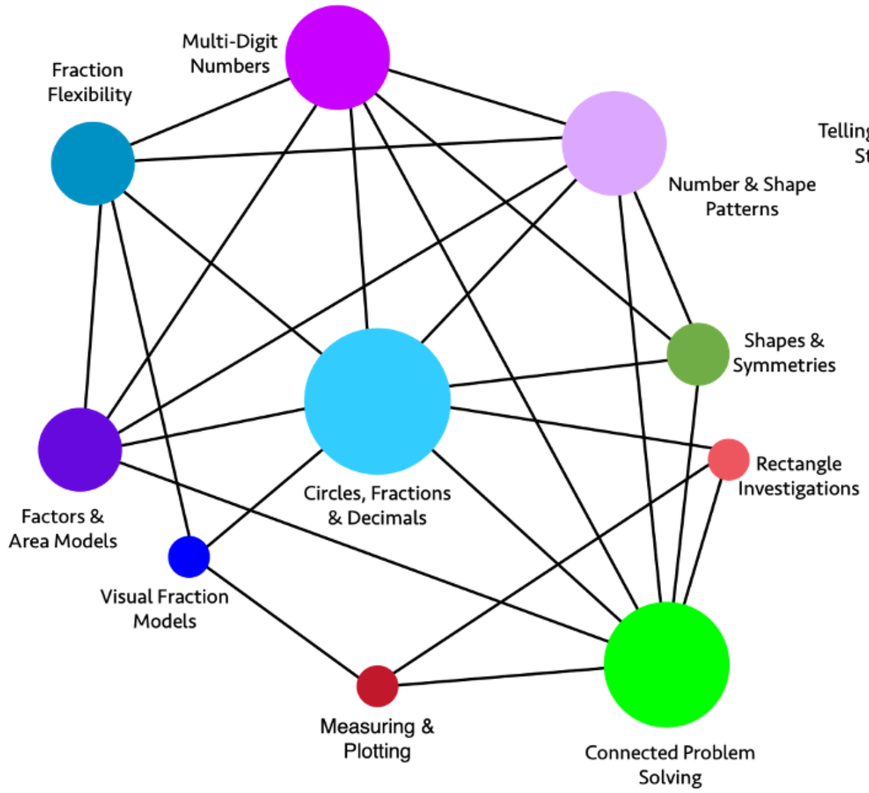


Big Ideas

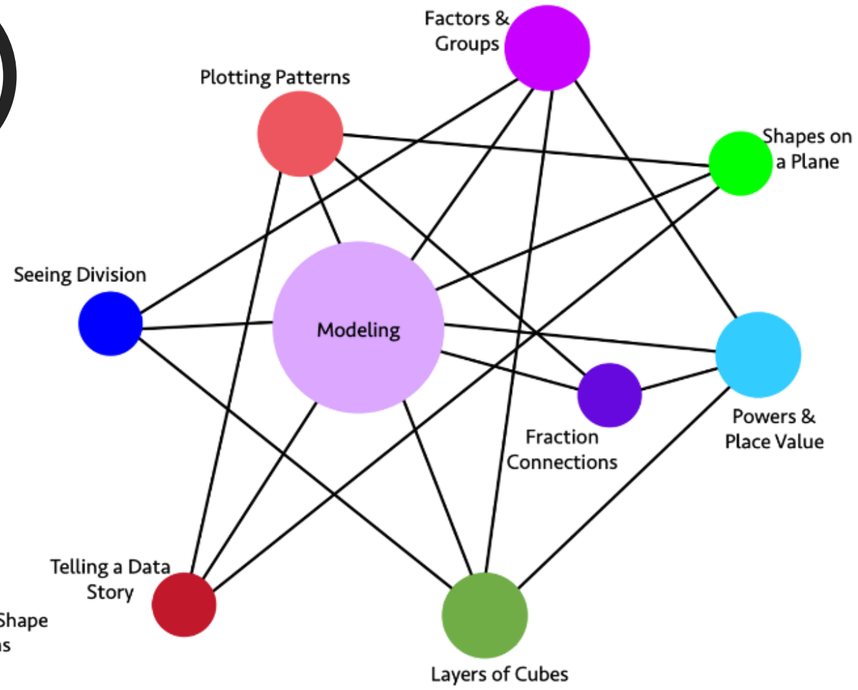
3rd Grade



4th Grade



5th Grade



Statistical Problem-Solving Process

.Formulate Statistical Investigative Questions

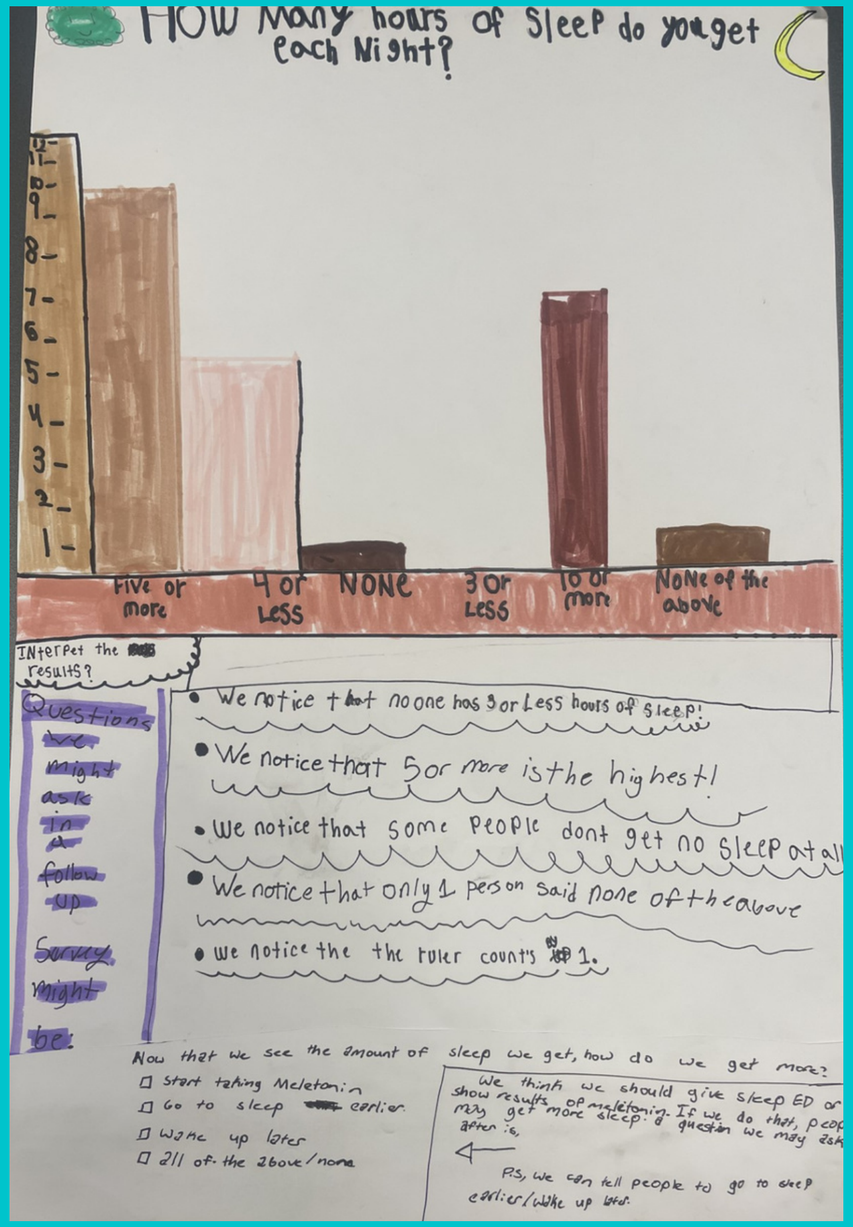
Collect/Consider the Data

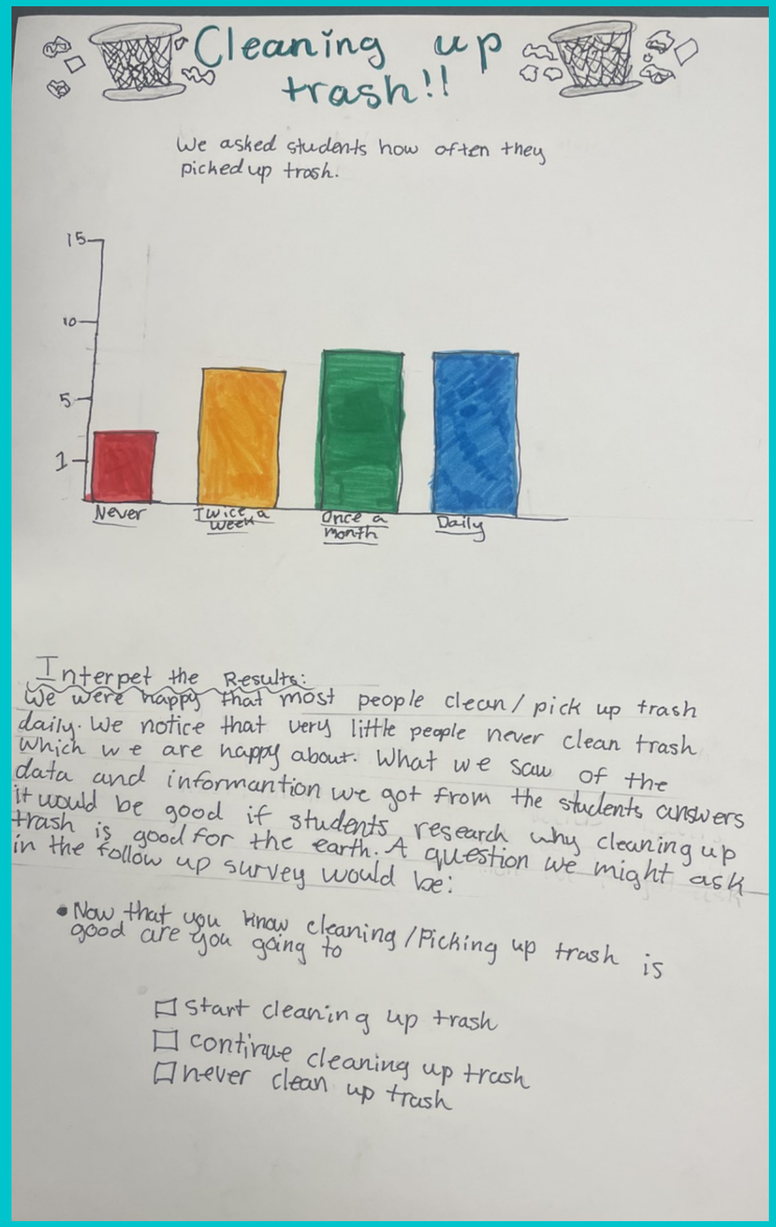
Analyze the Data

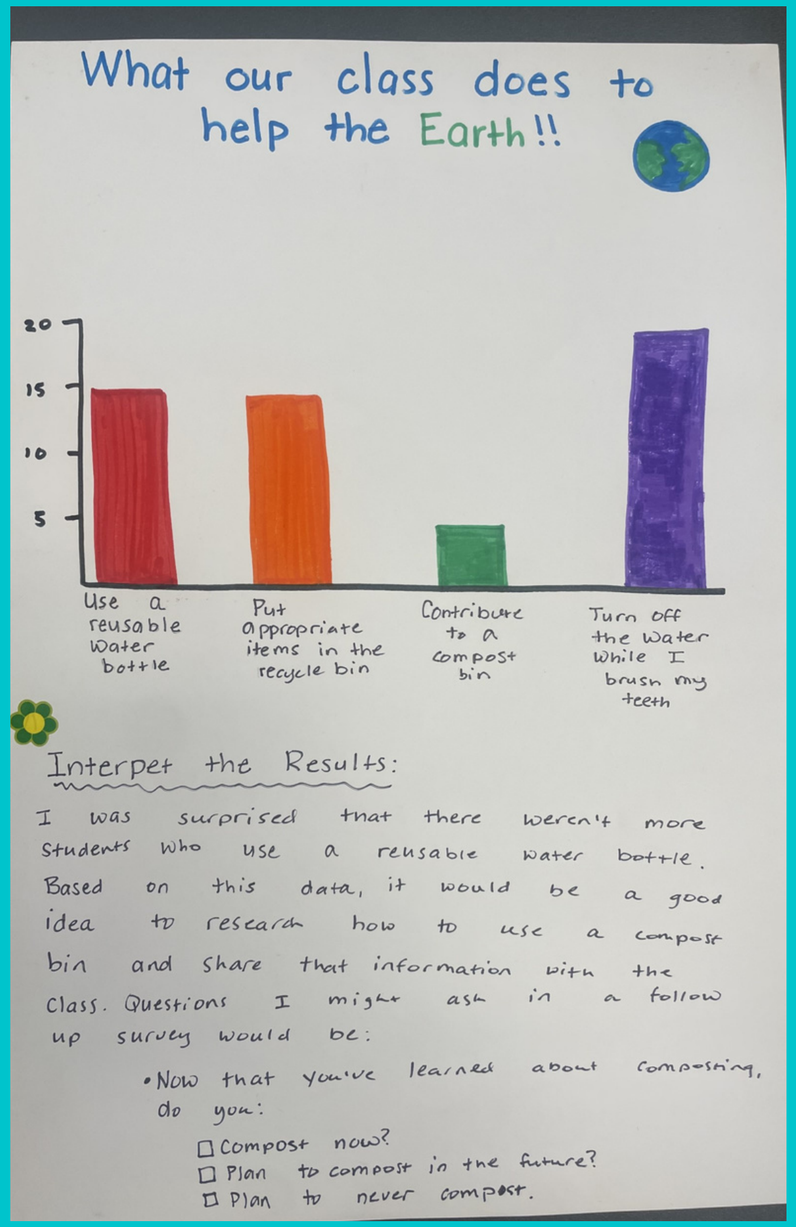
Interpret the Results

Source: Pre-K–12 Guidelines for Assessment and Instruction in Statistics Education II (GAISE II)
A Framework for Statistics and Data Science Education

Student Work Samples







Creating Data-Centered Tasks

Using the statistical problem solving process, team up or work on your own to create a data centered task that you can use once you return to your school sites or classrooms.

Consider using:

- The Drivers of Investigation *(WHY)*
- Standard of Mathematical Practice *(HOW)*
- Content Connections *(WHAT)*

as a framework to create your task.

Consider using the idea of ***"expanding the narrative of who belongs"*** to drive your planning .

Planning Considerations

- The Statistical Problem Solving Process
- The Drivers of Investigation, SMP's and Content Connections
- Expanding the narrative of who belongs
- If your students are collecting data, how might they collect it? Will they have choices?
- What guidelines will you provide for students to analyze the data and interpret the results?

Resources

Planning Template

SCAN ME

Big Ideas

SCAN ME

Share Out!

Conclusion

What potential barriers exist that would prevent you or your teachers from implementing more data centered tasks in your classroom?

How can we overcome those barriers?

What support do you need?

After all of that, which David Rose are you right now and why?

Contact Me!

Instagram: @collaborativemathcoach

Twitter: @mrs_sdholloway

stephanie.holloway@leusd.k12.ca.us

Resources:

CA Math Framework: Ch.5

YouCubed Data Talks

Planning Template