

REHUMANIZING MATHEMATICS THROUGH COLLECTING AND REPRESENTING DATA

by Amy Vickers

During the winter of 2020-2021, when it became necessary to meet with my students through videoconferencing instead of in-person, I was motivated to try activities that would build community, foster a feeling of belonging, involve creativity, and give students a chance to work with their hands. I had been thinking about [temperature blankets](#)¹ for a few years, and how they might belong in one of my math classes. Though they take many forms, temperature blankets are often a knit or crochet project in which the artist assigns temperature ranges to yarn colors and then knits or crochets one row for each day of the year that corresponds to the temperature for the day, thus producing a beautiful blanket that is also a physical representation of temperature change over the year. I decided that now was the time to do this with my math students, but I wanted to open it up to invite students to track anything that interested them and represent it with any art form that they chose. From here, I wrote the Analyzing Data Creatively activity and incorporated it into my Principles of College Math course. (The Representing Data Creatively Activity follows this article.)

For each project, students collected data from their own lives, organized it, and then shared representations of their data in a creative way of their choice. As the projects started to take form, I discovered an unexpected strength of the project: namely, the time we spent with revisions and reflections. In so many cases, students needed to adjust their projects in some way as their datasets grew. These pivots led to so many interesting conversations. We discussed unexpected ranges of data, we found ways to organize the data so that patterns emerged, and we realized the practical limitations of our original ideas. All of this authentic question asking, problem-solving, revising, and persistence felt so rich in the context of a math course. As you look through the projects that are featured in this article, please note how students chose to organize their data, the varied ways they responded to the unexpected, and the creative ways they chose to represent their data.

Amber Ames represented her caffeine intake and sleep with a paper chain.

COLORS = Caffeine
0-20 oz : Blue
21-40 oz : Purple
41-60 oz : Pink
61-80 : Green
81-100 : Orange
100+ : Yellow

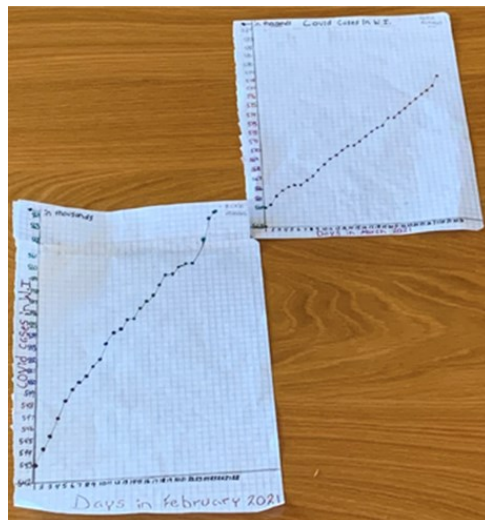
Sleep = # of Circles
Example:
5 Blue Circles =
0-20 oz of Caffeine + 5 hours of sleep.

Midcourse revision: Based on her new understanding of her caffeine intake, Amber decreased her daily caffeine toward the end of the project .



Katie Mathews represented the number of COVID-19 cases in Wisconsin with a line graph.

Monday	Tuesday	Wednesday	Thursday	Friday
543,445	544,260	545,437	546,955	548,221
550,369	551,060	551,871	553,110	554,098
555,708	556,332	556,989	557,722	558,496
559,998	560,564	560,564	562,151	562,807

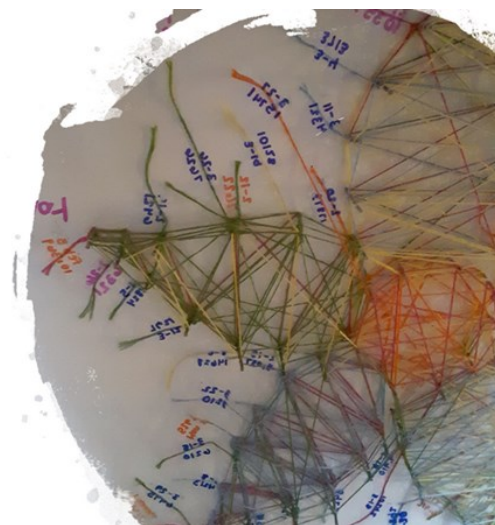


Midcourse revision: Katie had to reorient her graph paper because the cases were climbing so quickly.

Katie Hume made a flower from string art to represent the number of steps that she took each day, organized by the day of the week.

Step / Color key

- Blue – 3,000-6,000 Steps
- Green – 6,001-9,000 steps
- Pink – 9,001-12,000 steps
- Yellow – 12,001-15,000 steps
- Orange – 15,001 – 18,000 steps
- Purple – 18,000+ steps



Midcourse revision: Katie figured out that by using a 5-petaled flower with a center and stem, she would be able to see patterns in her walking by day of the week.

Shanna Hinkle represented high and low daily temperatures with a crocheted blanket.

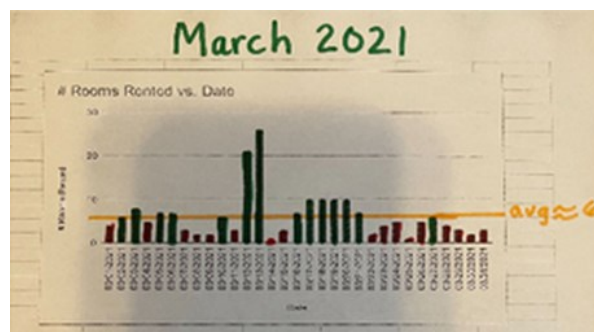
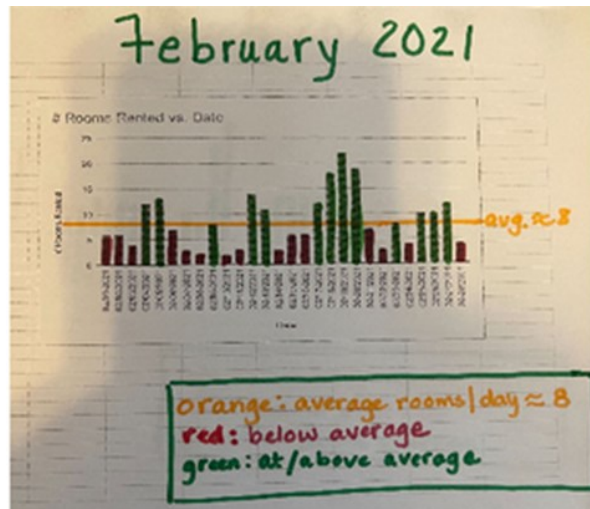
Day Time Highs		Nighttime Lows	
▶ -5 to 9	Light Pink	▶ All -0	Dark Grey
▶ 10 to 25	Medium Pink	▶ 0 to 15	Medium Grey
▶ 26 to 35	Dark Pink	▶ 16 to 24	Light Grey
▶ 36 to 45	Violet	▶ 25 to 32	Sparkle Grey
▶ 46 to 55	Robins Egg Blue	▶ 33 & up	Cream
▶ 56 to 65	Grass Green		



Midcourse revision: Shanna had just recently moved to Wisconsin. She had to adjust her temperature ranges part way through the project because she did not expect such a wide temperature range.

Chelsea Lee made a bar graph to track occupancy rates at the hotel where she worked.

Date	# Rooms Rented
03/01/2021	4
03/02/2021	6
03/03/2021	8
03/04/2021	5
03/05/2021	7
03/06/2021	7
03/07/2021	3
03/08/2021	2
03/09/2021	2
03/10/2021	6
03/11/2021	3
03/12/2021	21
03/13/2021	26
03/14/2021	0
03/15/2021	3
03/16/2021	7
03/17/2021	10
03/18/2021	10
03/19/2021	10
03/20/2021	10
03/21/2021	7
03/22/2021	2
03/23/2021	4



Reflection: “As the manager, I could see that business was slow, but to actually see it on a graph and to see the room charge differences from a good year to our current year was a huge shock.”

As an educator, I expect to keep learning and improving my practice. I hope that this project will continue to evolve from year-to-year as well. Here, though, I share it in its first draft form. It provided what I had hoped—opportunities to find healing through working with our hands, a stronger sense of community, more art and creativity in our lives, and students having the opportunity to bring more of their full selves into the math classroom. I want to thank all of the students in this class, only about half of whose work is shown here. I appreciate your willingness to try such an open-ended project and I recognize your conscientiousness in the way that you fully committed to completing these projects through all of the twists and turns.

Thank you to all of the educators, researchers, and community members who have shared their stories and expertise through webinars, book studies, and research papers during the time of the COVID-19 pandemic. You have helped me see and understand the value of and need for rehumanizing mathematics, which I am trying to do through projects like this one. In particular, I would like to thank the [Nicolet College](#) Many Ways of Knowing project, [TODOS](#), [Disproportionality Technical Assistance Network](#), [Wisconsin DPI American Indian Studies Program](#), ANN’s [Racial Equity in Math Education committee](#), and contributors to the [ANN Social Justice & Math](#) page.

¹A temperature blanket is a blanket that is created with a variety of colors, each color corresponding to a specific temperature range. Every day for a year, a row is knitted or crocheted on the blanket that represents the day’s temperature.