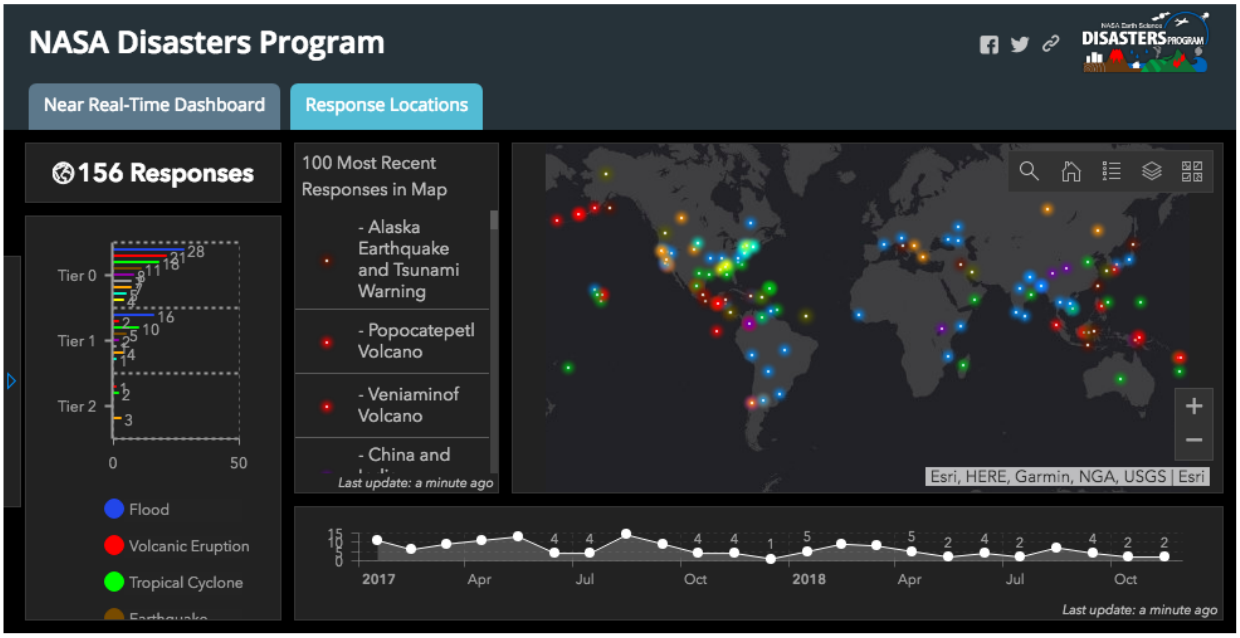
Elizabeth Allen
Mandatory 3: Data...and Math Are Everywhere

1. The data source chosen is from the NASA Earth Science Disasters Program (https://maps.disasters.nasa.gov/).



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2. This data source was chosen for seventh grade students as an engaging source for a variety of reasons. This content aligns well with the middle school Next Generation Science Standards for Earth and Space Sciences in the area of Earth's Systems. The visual presentation is clearly labeled and color coded for navigation purposes and the location of specific data points. Patterns and trends can also be determined from the graph and associated map of locations.
It will serve as an engaging context for math students studying percents and proportions because disastrous events are often a point of interest due to the magnitude with which they effect a community. The content aligns directly with the students' studies in science and how many of these events occur in Earth's Systems.
3. & 4. I would anticipate the lesson being taught over the course of a three or four day period, depending on how much time is allotted for math. The objectives can be broken up across the days, with a mini-lesson taught at the beginning for the skills involved in that part of the lesson.
Small groups of students can also be taught the skills that they are less secure in.

Common Core State Standards -Mathematics:

7.RP.A.2: Recognize and represent proportional relationships between quantities.

a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

7.NS.A.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

7.SP.B.3: Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.

Next Generation Science Standards:

MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

Cross-Cutting Concepts: Graphs, charts and images can be used to identify patterns in data.

Standard	Objective ("WALT" = "We are learning to…")	Depth of Knowledge	Assessment
7.RP.A.2	WALT calculate ratios ---------- WALT compare ratios to determine if the most frequent hazardous events are proportional to each other in various parts of the world.	1: Calculate the ratio of each of the following events based on the total number of responses: -floods -volcanic eruptions -tropical cyclones -earthquakes -landslides -wildfires -severe weather -winter weather -industrial accidents ---------- 2: Categorize the events that occur most frequently in the U.S./N. America with another continent that	The student will accurately calculate the ratio of events based on the data collected from the data source ---------- The student will categorize the three most frequent events in the U.S./N.America and then calculate the ratios for those events on a second continent of their choice to determine if the relationships are proportional.

		the student has selected	
7.NS.A.1	WALT compare the average number of Tier 0, Tier 1 and Tier 2 events by creating a number line diagram for 2017, 2018, and 2019.	3: Graph numerical data 3: Draw a conclusion as to why there is a variation in the differences of tiered hazardous events.	The student will create three line graphs for years 2017, 2018 and 2019, where each hazardous event type is represented.
7.SP.B.3	WALT analyze proportions to determine which part of the world is susceptible to hazardous events.	4: Form small groups representative of each continent and analyze the proportions of each of the top three hazardous events	The student will complete a table with the three most hazardous events and compare their ratios from around the world to determine if the events occur proportionally
MS-ESS3-2	WALT identify hazardous events around the world and define what they are. --- WALT use data as evidence to draw conclusions.	1: List events from the data source and define what the events are --- 3. Draw conclusions	The student will create a list of nine hazardous events from the data source and define what they are using given resources --- The student will use their data and calculations to draw conclusions about which part of the world is most susceptible to hazardous events

5. Methods of Collecting Student Data:
(Students respond via a Google Form)

Survey Questions “Pre-” Data and Math are Everywhere Activity (Students will rank their thoughts as “Strongly Disagree, Somewhat Disagree, Agree, or Strongly Agree)

- I usually see how the math I learn is relevant in the real world.
- I am interested in what happens in other parts of the country or around the world.
- I enjoy learning about other subjects in math, and vice versa.
- I find data, charts, and graphs interesting to read.
- I find data, charts and graphs interesting to collect and create.
- I can understand math better when I’m not just following a procedure.

Survey Questions “Post-” Data and Math are Everywhere Activity (Students will rank their thoughts as “Strongly Disagree, Somewhat Disagree, Agree, or Strongly Agree)

- From this activity I can see how the math I learn is relevant in the real world.
- I am interested in what happens in other parts of the country or around the world.
- I enjoy learning about other subjects in math, and vice versa.
- I find data, charts, and graphs interesting to read.
- I find data, charts and graphs interesting to collect and create.
- I can understand math better when I’m not just following a procedure.

Anticipated Survey Results:

For seventh grade students I would anticipate that their “Pre-Activity” survey results would largely show that they disagree with the first statement that they see how math is relevant in the real world. About half and half would show an interest in what happens in other parts of the country or world. I would anticipate that most would disagree that they like learning about other subjects in math (they seem to want to compartmentalize everything--especially if they prefer certain teachers over others.) Most would agree that they find data, charts interesting to read, and maybe interesting to collect. I think most would agree that they understand math better when they are not just following a procedure, however some would strongly disagree with that if they have had success with straight procedural learning in the past.

I would anticipate in the “Post-Activity” survey that the areas they initially disagreed with would make some movement to the more positive agreement statements.