Hello Carla,

I am sorry you had trouble loggin back into the zoom. Here is a link to watch the rest of the class. You can just make a doc with your chat responses for the class & put it into the dropbox for credit. Please reach out to Deanna to work on your Math Modeling Project.

https://endeavorstemeducation.zoom.us/rec/share/sflnT5Jzo_y4c5qJcJ__qBxD8EO33u4HeWZTJQy7TQybl74dGC8L7xN09xJFByul.p6l2hhWNBk6DCHrY

Passcode: QcLU!6CJ

**Let me know if you have any questions,**

Lisa

Notes from LIVE Session:
- JPL Resource - so cool! Love this! Thank you for sharing!
- SpaceMath@NASA - I remember learning about this resource in a prior course "Methods of STEM Education." Really cool site!
- Elementary Example from Space Math Examples
  - Chat: You could take this data and have students create a story graph or operations with fractions or positive/negative numbers.
- Algebra Example: Moore's Law
  - Have you seen a graph similar to this? - No, not that graph exactly, but I have seen a line graph before…
  - Oh, Exponential Growth! Cool! Covid Graphs would be a great example to pull into the classroom.
  - Data trends!
  - Love how you said we teach math so they get this concept in science class and also in life!
- Progression of Fractions!!! - I hadn't really thought about it like that.
- https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Fraction-Models/
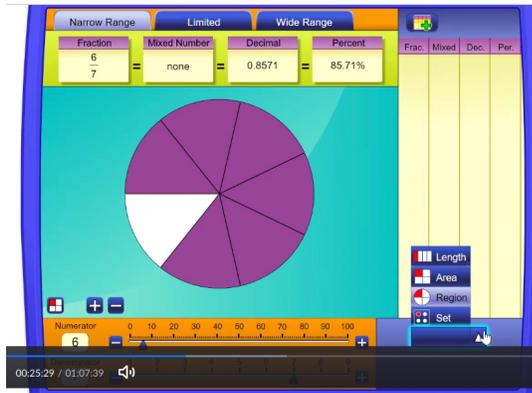
- I had not seen this before, but I think it looks like a fantastic resource!
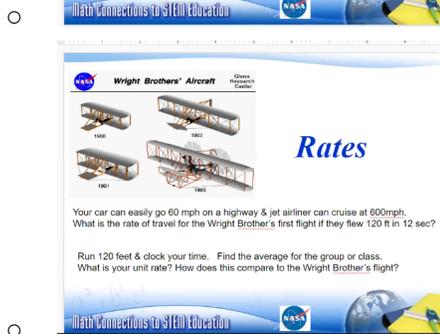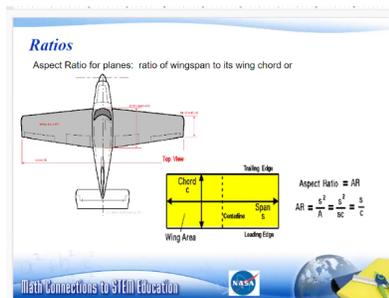
- ○ Authentic Data -
    - ■ How can you find it using technology?
        - ● There are online simulators that can be used for data sets.
    - ■ What sources are reputable?
        - ● I believe that the NASA resources are reputable.
        - ● I have run across https://datanuggets.org/resources/data/ which includes a collection of websites that offer freely available online data.
    - ■ How can you collect your own?
        - ● I have had students create surveys, collect data from their classmates to use for a persuasive writing piece.
        - ● I have also had them to research data from local businesses when working with systems of equations.
        - ● Some idea listed from my classmates in the chat were:
            - ○ Eyes on Earth
            - ○ NASA resources

- USDA
- USGS
- https://www.gapminder.org/data/
- NOAA Meteorologist
- website had to end in .org or .gov to be a reputable source

- https://www.nctm.org/Classroom-Resources/Illuminations/Interactives/Pandemics-How-Are-Viruses-Spread/ - I have not seen this before! That is awesome! Seeing the real-time changes.
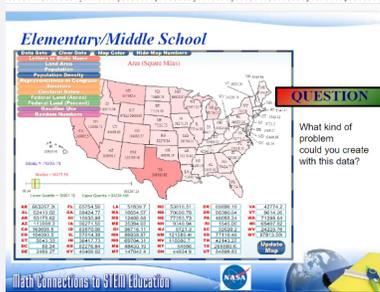
- The possibilities with this data are endless! Cool resource!

Progression of Statistics

CCSS Content Standards Addressed:
GD6 Develop understanding of statistical variability.
* Understand data can be described by its center, spread, and overall shape.
* Display data in plots on a number line, dot plots, histograms, and box plots.

GD7 Use random sampling to draw inferences about a population.
* Measuring difference between centers; expressing as a multiple measure of variability
* Construct & interpret two-way tables; summarizing data on two categorical variables collected from the same subjects
*Express and understand likelihood of an event. Develop probability model to find probabilities of an event. (ie; lists, tables, tree diagrams, simulations)

GD8 Investigate patterns of association in bivariate data.
*Construct and interpret scatter plots to investigate patterns between two quantities.
*Construct best fit lines; interpreting patterns in data such as slope and intercepts

HS ALGEBRA & STATISTICS

NGSS Addressed: Life & Physical Science

Math Connections to STEM Education

Elementary Example

Engage

- How strong are you?

- Do you think this is inherited?
  Can we change your strength aptitude?

- Does this differ for girls & boys? How does this differ in space?

- Click clothes pins and record number in 1 min. - gather data
- Do the same for non-dominant hand
- Do this again over some weeks, hopefully see some growth, building stamina.
- What do you expect to see?

Analyzing your Data

		Trial 1	2	3
Initial Test		82	80	70
Wk 1	M	83	83	75
	W	85	84	75
	F	85	84	77
Wk 2	M	86	85	78
	W	89	86	78
	F	90	88	80

Have the students write to EXPLAIN what happened to their hand strength. Why do you suppose it turned out this way?

Math Connections to STEM Education

- What conclusions can you make?
- Not a linear relationship, increases & decreases.
- Tie this to building muscle mass (muscle stress)
- How does NASA develop astronauts, how to we prepare them for space and how do our bodies respond differently on earth vs. space?

Stress on Your Body

- **ENGAGE** class discussion
  Good stress vs. bad

- NASA Twins research- Kelly brothers
  check out NASA ScienceCasts: Separated at Launch

- Discuss how physical stress
  can have an effect on muscles & bone over time
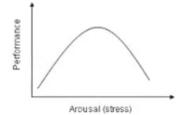
Math Connections to STEM Education

- Challenge kids by asking them to graph the data, without directions of HOW to do it. Allow them time to THINK about the different ways .
- box & whisker plot https://www.geogebra.org/m/p4bdvjdu
- line of best fit http://illuminations.nctm.org/Activity.aspx?id=4186
- stem & leaf plot
  http://www.shodor.org/interactivate/activities/StemAndLeafPlotter/
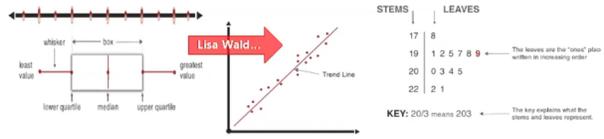
- ■ With my background in what I teach, I am partial to the line of best fit, but I don't think it works as well for the data as the Stem-in-leaf does.

- ■ Geogebra.org

  - ■
- ■ Extension:

- Group Modeling Project: