Data Integration Assignment

Title: Connecting Data, Graphs and their Equations
NASA Data Source: https://www.nasa.gov/multimedia/imagegallery/image_feature_734.html

Lesson Enhancement:
Student Resource: https://spacemath.gsfc.nasa.gov/algebra2/CH2v3.pdf

I have been exploring this particular unit over graphs and their equations. What I like about this unit is how it connects concepts in a way that flows like a story. The first lesson within this unit explores simply graphing data points. This seems like a very simple concept, but students are able to see how data points can show a pattern or relationship. The data source through NASA allows students to see the example from the unit, but also let's them explore other data sources. After students work through the original lessons, students are then able to work with other data sources to promote students to ask the "why" questions we seek from them. Students are able to wonder why some data may result in a particular pattern while other data results in a different pattern, or no pattern at all. Using data from real-life scenarios opens the opportunity for these questions rather than just giving them canned data and expecting students to just accept things the way they appear. Data integration changes the teaching environment from having teachers lead the lesson and discussions, to having students pose questions and lead their own learning. As a teacher I can now act as a guide rather leading them through their every thought.

Using Data:
I love the idea of students using data to guide their thinking. I believe it allows students to wonder why things happen the way they do, how things could be changed, and how they could affect or be affected by things in this world. I also believe, having students explore pre collected data could be a fantastic way to use phenomena as a base for learning, but having students collect their own data could be even better. Students being able to actually use their own personal observations as a way to learn a new concept may help them learn the concepts even better. Students will be able to take more pride in being able to develop their own learning and accomplish things independently. Whether it be student-observed data or data from other sources, this can provide a great learning experience for student-driven questions and learning.

Rationale:
My rationale behind using this data source was for students to think about more than just the example from the student resource. The first example in the student resource appears to be a positive linear relationship. The data source allows students to explore other resources and ask questions like:

"Why is this data source linear too"
"This resource has no pattern. Why?"
"This resource seems similar to our first one but it's a negative linear relationship. Why"

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This is the goal behind using the data source. It deepens the learning of the standard being taught and allows for students to see connections between standards in other content areas. Students will see relationships between scientific concepts that impact why a certain data set appeared linear, or why it might have been better represented as an inequality. While the goal of all of the lessons was to teach a particular concept about

equations and their graphs, they were all based on a scientific concept. This exposed students to material and learning about other concepts besides just math. It also used technology to enhance the lesson other than just the examples on paper. Using data is an easy way to naturally bring in questions about other factors beyond our own content areas.

Interdisciplinary STEM:

This student resource is intertwined with science throughout the entire unit. The data integrated within it allows students to question things beyond our own content areas and helps connect teachers of various content areas as well. I think this will change current STEM pedagogy. This particular lesson, for example, would not only be a great opportunity, but also most effectively taught with collaboration between a math and science teacher. This could be taught in a way that students work through the mathematical concepts and pose questions. These questions could then be worked on by transitioning to the science standards and finishing the lesson with the science teacher. It allows students to learn the math and science standards while seeing the connections between the two. I feel like data integration in general allows for this cross curricular engagement among students.