Authentic Data Integration

The integration of authentic data into a lesson is a very powerful approach to providing students with an opportunity to engage in information and tasks beyond traditional textbooks. In an ever changing world with unlimited access to resources beyond the classroom, integrating real-life data into our classrooms is more feasible now than ever.

Data Source

This assignment has be inspired by 2 different resources:

1. The Launch of LADEE to the Moon - https://spacemath.gsfc.nasa.gov/weekly/10Page66.pd, from **Space Math @NASA, https://spacemath.gsfc.nasa.gov/**

2. Replay: New Shepard Mission NS-18 Webcast @ https://youtu.be/uEhdIlor-do

Lesson Enhancement

In my 8th grade math classroom, we learn about slope of lines and rate of change. The Space Math @ NASA assignment, The Launch of LADEE to the Moon, is a great example of how to bring in real launch data for students to graph, analyze, and see first hand real-world applications of these concepts. This resource provides students with real data from theLunar Atmosphere and Dust Environment Explorer (LADEE) to the moon in September of 2013. According to the resources, this was a very interesting launch as it was visible in many states due to the launch occurring at night the blast lighting up the night sky. The activity provides students with a launch data set including time, altitude, range, and speed. Students are given the tasks to create various graphs from the data, calculate the slope, and interpret the data and share what it represents (vertical speed of the rocket, horizontal speed of the rocket, and average acceleration of the rocket). Also, students can use the newly calculated horizontal and vertical speeds along with their knowledge of the Pythagorean Theorem to find the total speed of the rocket.

The format of the LADEE assignment was very user-friendly and would be easy to modify for use with any rocket launch and complete the same tasks. Recently, on Wednesday, October 13, 2021 Blue Origin launched the New Shepard Mission into space, and I watched it LIVE with my students via https://youtu.be/uEhdIlor-do. It was really fascinating to be able to share this real time experience with my students and have discussions about how far space

travel has advanced as this rocket can now be used for space tourism. It would be very easy to take the format of the LADEE assignment and complete the same tasks with the authentic data from the New Shard launch! This would be more meaningful for students since they witness the rocket launch in real time during class. I would ask students to collect their own data from the video as the LIVE stream link shared real time data of velocity & altitude. By having them gather their own data from observing the launch, we are taking the process a step further.

Interdisciplinary Context

Using authentic data from actual launches, provides the opportunity for many interdisciplinary connections. The following are a few examples of how those connections to other content areas could be made:

- Science - Space launch data (speed/velocity, altitude, range), discussion of launch process, space exploration, astronaut training, Karman Line, Newton's laws.
- Engineering - engineering careers (mechanical, aerospace, chemical, materials engineers). Compare data from rocket launches of different designs.
- Math - graphing, analysing, and interpreting data from rocket launch.
- Social Studies - The evolution and history behind rocket developement & design as described in A Pictorial History of Rockets at https://www.nasa.gov/sites/default/files/atoms/files/rockets-guide-20-history.pdf

References

Blue Origin. (2021, October 13). *Replay: New Shepard Mission NS-18 Webcast*. Youtube.

Retrieved October 13, 2021, from https://youtu.be/uEhdIIor-do

A Pictorial History of Rockets (NASA, Compiler). (2020). NASA.

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https://spacemath.gsfc.nasa.gov/weekly/10Page66.pdf