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Data Integration Lesson Plan

One of our science units of study in 5th/6th grade is earth's resources and more specifically how fresh water is a limited and important resource. The expectations are that students understand how water is distributed on earth and to identify problems and propose solutions related to water circulation, quality, and distribution, both locally and worldwide. I found a fantastic lesson from NASA that tracks water across the globe using satellite data from space that would be a great hands-on way for students to discover the trends and patterns of water distribution on their own. I plan to use this lesson as a introduction into these curriculum standards. The website for the lesson is here: https://www.jpl.nasa.gov/edu/teach/activity/tracking-water-using-nasa-satellite-data/

Here is the data source link for the data integration lesson that I would use in my 5th/6th grade classroom: GRACE Data Over the United States. NASA's GRACE satellites measured land water storage in the US from 2003-2013. The video shows patterns of water movement and trends in changes of water height in millimeters for the last 10 years.

Whenever I use data in my classroom, it's usually a sure fire winner in my classroom. Some of my more successful lessons are when my students are collecting their own data and actually doing something, as opposed to memorizing something, even if the results are a little messy. Just recently, my students calculated the area of complex shapes on our playground using Google Pro and Google's ruler tool. We wanted to find the answer to the question: How many 5th graders could fit in a play area? We talked about the real world application and compared our work to the capacity signs found in public places. At first we had some debate on what type of measurement to take (inches, feet, or meters?). Then we discussed the accuracy of using online tools like Google ruler vs. a measuring tape on the playground. (We took measurements using both methods.) Then we had to come to consensus on what measurements to use. Plus, we talked through how we could calculate the area of an average 5th grader after much discussion.

Students were engaged, relied on their classmates to refine their data, shared and debated ideas, and had the joy of discovering things on their own. The lesson took longer than expected, they always do, but the students took ownership for their learning and were part of solving a real world problem. Integrating data is also a great way to get students to think about problems with depth and complexity, e.g what are some of the patterns in the data that you notice when calculating the area of complex shapes on the playground? What are some of the important details to consider when analyzing the data we found?

In the lesson "Tracking Water Using NASA Satellite Data" (2018), the embedded data is a source for incorporating several math standards required of 5th/6th grade students. Some of the standards covered: Summarize numerical data sets, analyze statistics, solve real world problems involving measurement and data, understand trends in data and build a graph from a set of data. Another way

to create a connection to other content areas is to include social studies curriculum as well. One of the expectations is that students know the geographic locations and regions of the western hemisphere. I would include a mapping exercise for students. In addition I would ask probing questions like, How has water distribution changed over time across the US and what new information does that give us? What trends or patterns do you notice? I would explore the perspectives of different people and their interest and interactions with the data. What would a scientist do with this data? What would a city planner do with this data? A politician? A farmer? A business owner?

References:

Tracking Water Using NASA Satellite Data Activity | NASA/JPL Edu. (2018, May 18). Retrieved from https://www.jpl.nasa.gov/edu/teach/activity/tracking-water-using-nasa-satellite-data/