

Data Integration

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Data Integration Assignment

Methods of STEM Education

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Earthquake and Volcanic Activity Data:

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[Using Earthquakes with a magnitude of 5 or greater](#) and [Volcanic Eruptions of VEI 1+](#)

In the lesson, students are being asked to analyze data of past earthquake and volcanic events to see how some areas along boundaries and fault lines are more likely to experience earthquakes and volcanic eruptions. Using the data provided, students will use map skills (previously learned in social studies), to plot the locations of the volcanic eruptions and earthquakes. This data will be used to interpret the map and determine where most earthquakes and volcanic eruptions occur. Students will use the data, and prior knowledge of boundaries and faults to effectively communicate and answer the lesson essential question: How can people predict and plan for volcanic eruptions and earthquakes? By using data in this lesson students are able to model the location of earthquakes and volcanoes in order to get a better understanding of where these phenomena occur and why they occur only in these places. Without the data, students would be able to understand the why, but not be able to make that personal connection to the information. Making a personal connection helps students learn, retain the information and continue to stay engaged in learning.

Personally, using data in the classroom is beneficial to students. Data can be used in many ways, across all content areas. By using data in the science classroom, students can see the connections between those content areas and being put to use in real life situations. Another reason that I believe using data in the classroom is beneficial is to allow students the opportunity to think critically. “While analyzing data strengthens critical thinking, critical thinking in turn helps data analysis.” (Reding et al. 2017) Critical thinking skills are critical in the understanding of how the world works and the phenomena behind those workings. Lastly, data in the classroom can be most beneficial when students are the ones collecting the data. As previously stated,

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students retain information and stay more engaged in learning when they are able to connect information to real life situations. When students conduct and investigate themselves and collect data from something that they did, the higher of a chance that learning is taking place.

I chose to use the data source because I believe that it is relevant data for students to actively be interested in and it connects to a key standard in my curriculum. In sixth grade science students must be proficient in the standard 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. By using this data and mapping the locations, students will be able to clearly identify the locations of earthquakes and volcanoes and predict where another earthquake or eruption can take place based on their findings on the map.

The data used in this lesson crosses over three different content areas. Students use scientific data to read and interpret to create a map, which connects students to social studies and geography standards. This allows students to see how science and social studies can go hand-in-hand when it comes to the history of the Earth. Mathematical practices are also used in this lesson. In the mathematical tenets, one of them is Data Analysis and Probability. “It emphasizes learning appropriate statistical methods to analyze data, making inferences and predictions based on data, and understanding and using the basic concepts of

probability.”(National Council of Teachers of Mathematics , n.d.) In science, mathematical standards coincide with each other in certain topics, students will be able to see this and get a greater understanding of the purpose of analyzing data.

### References:

Reding, Kurt F., et al. “Improving Critical Thinking Through Data Analysis.” *Strategic Finance*, 2017,

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<https://sfmagazine.com/post-entry/june-2017-improving-critical-thinking-through-data-analysis/#:~:text=ANALYZING%20DATA%20HELPS%20CRITICAL%20THINKING&text=The%20relationship%20also%20is%20reciprocal,in%20turn%20helps%20data%20analysis.&text=Data%20analysis%20requires%20you%20to,disparate%20facts%2C%20synthesizing%2C%20etc.>

National Council of Teachers of Mathematics . (n.d.). Principles and Standards - National Council of Teachers of Mathematics. Retrieved from <https://www.nctm.org/Standards-and-Positions/Principles-and-Standards/>

Lesson adapted from Teach TCI, Program Bring Science Alive! Planet Earth, Unit Earth's Natural Hazards, Lesson Volcanic Eruptions and Earthquakes, Investigation Investigation 1: Locations of Earthquakes and Volcanoes around the world.

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