Engaging Context Data Integration: Landforms

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Standard: New York State K-12 Social Studies Standards

Third Grade Geographic Reasoning

- Ask geographic questions about where places are located and why they are located there, using location terms and geographic representations, such as maps, photographs, satellite images, and models. Describe where places are in relation to each other and describe connections between places.

- Describe how human activities affect the environment of a world community; describe how the environment of a specific world community affects the human activities in that community

Data Source: The Significant Volcanic Eruption Database
https://www.ngdc.noaa.gov/nndc/servlet/ShowDatasets?dataset=102557&search_look=50&display_look=50

Lesson Enhancement:

In my classroom, we are currently working through our Landform Unit, where the third grade teachers base our lessons on a unit created by Sam Brian from Bank Street College of Education in 1994. The unit uses a terrain model and mapmaking projects to teach students about geography and maps. The unit uses lots of experiential learning in teaching geography and map reading.

Historically, my students are drawn to the lessons on volcanoes. Using this observation, I've been working through expanding the curriculum related to volcanoes, as we traditionally spend very little time discussing volcanoes and their impacts. By utilizing and analyzing data, students will have a stronger understanding of why volcanoes have developed in particular geographical locations and how living near volcanoes can affect human activity in those communities. This is a standard that, I feel, we as a grade did not put enough emphasis on in the past. After students have researched and analyzed their data, they will make a claim with supporting evidence to answer the following question: *Is there a correlation between Tectonic Plate Boundaries and Volcanoes?* Researching active volcanoes, such as Kilauea Volcano which erupted this year, also allows students to understand that volcanoes are still erupting and active throughout the world.

Lesson Development explaining Lesson Enhancement:

This lesson and data source will come after students have been taught about the different types of plate tectonics and movements as well as different types of volcanoes (Shield, Cinder Cone, Composite Volcano). A video will be shown to pique student interest and engage them in the lesson. I will use the following video clip of Kilauea volcano footage taken between July 24 and July 31, 2016 from the United States Geological Survey Website. https://www.usgs.gov/media/videos/k-lauea-volcano-halema-uma-u-crater-summit-vent-lava-lake-4k

Next, in partner pairs, students will be given a research sheet where they will need to find data on at least ten active volcanoes in the world. They will record the name, elevation, location (latitude and longitude), and last eruption date for each volcano. They will use the following website to collect their data: https://www.ngdc.noaa.gov/nndc/servlet/ShowDatasets?dataset=102557&search_look=50&display_look=50. Next, students will plot their data on a longitude and latitude map that has plate tectonics already drawn on it. Based on their work, students will analyze the data and hypothesize the correlation between tectonic plate boundaries and volcano locations. Students will also have access to the following link: https://cptv.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.tectonic/tectonic-plates-earthquakes-and-volcanoes/ to extend their research. We will also have a few subsequent lessons, where students will study how human activity has been affected in certain areas with volcanic activity as well as advancements that NASA has created to collect data on volcanoes.

Using Data:

I believe that using data in the classroom enhances instruction, if it is used purposefully and appropriately based on the age of the learners. It allows students to see real world application of what they are learning. It also prepares them for many jobs in the future, as many jobs require constructing and interpreting data regularly. Learning how to interpret graphs allows students to bring outside information into their world view. By using data, we are teaching students how to look for patterns and relationships and then interpreting what these patterns might mean and their implications. This is very important to develop mathematical reasoning, as well as build evidence to support claims in science.

We often construct and interpret data in teaching as well. As a team, we meet to discuss formative and summative assessments of our student populations and how we can adapt lessons to reach their needs.

Interdisciplinary STEM and Rationale for Visual Presentation

Although I previously cited the Social Studies standards that this lesson will be supporting, this data source can also be also be used to support STEM content areas. I will be using this lesson primarily to enhance my social studies unit, but it also correlates with what my

students will be learning in their science class. One of the core ideas for the third grade standards of Weather and Climate is "ESS3.B: Natural Hazards. A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1)." By first being able to understand how volcanoes are created, students will then be looking at how humans have been affected by volcanoes. This lesson directly supports this core idea as well as the cross-cutting concepts connected to this standard. Students will observe the cause-and-effect relationship between plate tectonics and volcanoes.

This lesson also supports the cross-cutting concept that science affects our everyday lives and is a human endeavor with a goal to learn as much as possible about volcano activity, in order to help predict future eruptions and hopefully save future lives. This lesson also supports many of the science practices. Students will be evaluating and communicating information obtained from their new knowledge based on their analysis of the data, as well as forming an argument with evidence to answer the guiding question. This lesson also hits upon many mathematical practices including using appropriate tools strategically, as well as reinforcing skill development such as constructing viable arguments and critiquing the reasoning of others.

References

Stroker, K. (2011, May 02). NOAA/NESDIS/NCEI -Significant Volcanic Eruptions. Retrieved from https://www.ngdc.noaa.gov/nndc/servlet/ShowDatasets?dataset=102557&search_look=50&display_look=50

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WGBH. (Ed.). (2018). Tectonic Plates, Earthquakes, and Volcanoes. Retrieved October, 2018, from https://cptv.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.tectonic/tectonic-plates-earthquakes-and-volcanoes/