10,000 Years of Volcanoes

Google Earth Expedition Link:

https://earth.google.com/web/@8.53506365,-2.91420484,-23163.58453822a,31750925.23306856d,35y,0h,0t,0r/data=Ci4SLBIgZmU2MjU5Y2E0Y2FiMTFlODgxOGM3MTM3ODRlMDYzMjMiCGxheWVyc18w

Smithsonian Link:

https://volcano.si.edu/gvp_currenteruptions.cfm

I feel that authentic data integrated into my science classroom is extremely beneficial to my middle-school students. For instance, I believe that it helps learners connect to the content by seeing relevant data that is real-world and not just teacher-made for the classroom. Taking data that is real, and can be manipulated by students is so much more exciting for them and me, as we explore science in context to the world they live in now. I have used some in the past, for mapping geological features like earthquakes for my seventh grade science class, or to interpret sea-surface temperatures when learning about El Nino in my AP Environmental Science course, but did not realize until this STEM course through Endeavor, just how important and meaningful it could make the learning experience for my students. It is not just fake or playing pretend scientist, it is authentic! Additionally, I believe that by exposing learners to this type of data, they will improve their analyzing skills, as they use the data to find patterns and trends, to think as a true scientist would, to further enhance the lesson to include scientific practices as well. This is a lesson learned that I whole-heartedly plan to further integrate into my current class for the year, and for the new STEM curriculum for K-5 that I'll be teaching next year.

The links above are a great start to help me achieve this goal in my science classroom. But, how can I use this data to create interdisciplinary lessons that connect to multiple disciplines, like engineering, mathematics, language arts, or even social studies? If I plan to be a great STEM teacher one day, I realize this will be an integral part of my job. As Barakos, etc. (2012) point out, to prepare students for a 21st century workforce, a STEM program is an integration of subjects into curriculum, and should not be divided, but "treated as one dynamic, fluid study." For the particular lesson above, which focuses on physical properties of volcanoes and their connection to plate tectonics, I can achieve the integration of subjects with some thought. I will attach the lesson below for more context to my writing. First, I can make a connection to technology by integrating data from sources like Google Earth Expeditions that require students to utilize their Chromebooks to complete a hyperdoc I created, which includes authentic data links for their reference. Secondly, Geography/Social Studies is integrated by including the use of two different types of maps, Google Earth pins, and world tectonic plates, where students must identify locations and physical features on the world maps, as well as the history of the volcanoes. Third, I can integrate mathematics, by having students analyze the data to find patterns in volcano locations in conjunction with plate tectonic theory, and also by calculating the duration of the eruptions using the Smithsonian link. Finally, the connection to Science is using data from the Google Earth Expedition to identify the physical properties of each volcano they choose to explore (identifying the type of volcano it is classified as, the viscosity of the magma and how this determines the shape of the volcano and how it erupts). I plan to use this particular hyperdoc at the conclusion of the volcano portion of the unit, as it encompasses several cross-cutting concepts I have already taught; forces

inside earth, tectonic plate theory, heat transfers, density, viscosity, and land features.

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