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Methods of STEM Education – Elementary

Nature of Science & Math: Analyzing the Presence in Everyday Communication

The article (The conversation, 2017) on solar flares and sunbursts engages my interest, as the sun is the earth's life source. Our recent course discussions have been to scrutinize the authenticity of how media portrays the Nature of science (NOS) subject matter. How well this article measures up to the NGSS tenets (NGSS, 2013.) and the Common Core State Standards (CCSS) of Math will be analyzed.

As the three-dimensional NOS intersects with crosscutting concepts, disciplinary core ideas and science and engineering practices (NGSS, 2013.), the article attends to the following three tenets: scientific knowledge is based on empirical evidence; science addresses questions about the natural and material world; and scientific knowledge is open to revision in light of new evidence.

The article poses its title as, "Massive sunspots and huge solar flares mean unexpected space weather for Earth" (The Conversation, 2017.) Unexpected, new, strong flare eruptions occurred during a normally low impact patterned period for this kind of large scale burst activity. The article does not minimize the effect that space radiation has upon its ability to disarm satellites and GPS technology reach even on the grounds of our earth. As the sun is being recorded for this data constantly, and this is an anomaly, it will bring new evidence into view that contradicts the previous 11-year solar flare pattern. "Active space weather, may wind up on the larger end of the scale, and will be the subject of lots of analysis and research." This meets the NGSS tenet of scientific knowledge is open to revision in light of new evidence and science addresses questions about the natural and material world. It also attends to a third tenet of scientific knowledge is based on empirical evidence by displaying and using empirical data of activity of solar flares, size, events and geographical data. The displays are engaging and informative.

As the CCSS Math standards reach to "encourage students to solve real-world problems", (CCSS, 2018) this article does address a real world problem that the sun's unexpected activity and questions what this new data means for our earth and technology out in space. Being able to decipher and analyze this data will have a great impact on how to discern flares before they happen on a possible catastrophic event in the future. This meets the CCSS Math standards tenet of: modeling with mathematics. The data relayed via satellites also follows the tenet of: reason

abstractly and quantitatively, by applying the data and searching for reasons for the anomalies through uses of measurements of activity levels. As the article posits the sun's possible future threat to more geomagnetic storms, it is vital that we pursue this line of inquiry quantitatively and elicit reasons behind the data.

In conclusion, the article summons future scientists by enlisting and encouraging you to become a citizen scientist by submitting data you observe caused by the sun's activity. During the solar maximum period, the sun causes an increase in the Northern Lights appearances geographically and can affect power grids, health of astronauts in space and the polar ice caps. The article has at least matched the methodology of 6 tenets of the NGSS NOS and the CCSS Math Standards and would be some excellent phenomena to propose to students.

References

<http://www.nextgenscience.org/sites/default/files/Appendix%20H%20-%20The%20Nature%20of%20Science%20in%20the%20Next%20Generation%20Science%20Standards%204.15.13.pdf>

<http://www.corestandards.org/Math/>

<https://theconversation.com/massive-sunspots-and-huge-solar-flares-mean-unexpected-space-weather-for-earth-83677>