Engaging Contexts Data Integration:

Local Weather Forecasts

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Endeavor – Methods of STEM Education - Elementary

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Lesson Title: Weekly Local Weather Forecasts versus Actual

Data Source

https://forecast.weather.gov/MapClick.php?x=110&y=132&site=okx&zmx=&zmy=&map_x=109&map_y=131#.W7LnCWhKhEY

Lesson Enhancement

In our second-grade classroom, we currently have a "weather reporter" every day at the morning meeting who reports the weather based on their visual observation of the outdoors. Tally marks are kept for each day that is sunny, rainy, partly cloudy, cloudy and snowy, and as the year progresses, the students take note of which type of weather is seen most and least. This is a very brief, but fun, activity for the children to participate in every day, but using data can really bring this to life. Using the local weather forecast, from the link above, to show students the forecast for the following week would allow the students to tap into another level of thinking about weather and prediction models. New objectives could be added with the goal of students understanding the basic weather prediction models in place, weather patterns, and observation comparisons. A thermometer can be installed on the outside of the classroom window and, alongside the NOAA forecasted temperatures and weather, students can document the daily temperature based on the outside thermometer and their visual weather observations. Adding this data element, along with the students' own recorded temperatures and data, would greatly increase student engagement and learning and allow the teacher to deepen their instruction, based on the big idea and deeper essential questions being added.

Using Data

Data brings the material into a real-world application for the students and allows them to see and understand the “why” and “how” questions of science, whether the data is from an official source or is student collected. For example, in this weather unit, students can use the data to begin seeing patterns in the weather through the seasons and dig deeper into big questions such as, “Why does the weather change in this way?”, or “How are these weather services able to give us these forecasts in advance?” I can see infinite opportunities for using data in science lessons and beyond. Learning in theory can only go so deep. The NGSS wants students to feel and see a connection not only between disciplines, but between their classroom learnings and the outside world. I strongly believe this will expand the students’ curiosities about the world around them and they will independently seek out and pay attention to data all around them, if taught how and why to do so.

Interdisciplinary context

Using this data will greatly increase the opportunity to integrate the lesson across multiple content areas, including STEM areas and ELA. In this weather example, the science discussions will encompass a wider range of topics, including seasons, weather patterns, the Earth’s movement around the sun, and more. In addition, technology can be implemented by allowing the students to use computers to search out weather forecasts, simulations of Earth’s orbit and any other related topic that comes up within the essential questions of the unit. Technology and engineering can also be implemented by allowing students to engineer, plan and build a device that relates to weather or weather observing or forecasting. For example, students can try to build their own wind device to mimic what may capture the wind for measurement

purposes. It is up to the teacher to determine how student led the unit can and should be, based on the make-up of the class. Math is naturally integrated into weather units, as students are not only working with numbers through the data, but they are also comparing the differences in temperatures between the forecasted and actual temperatures and between seasons. ELA can be integrated through the incorporation of nonfiction books on these science topics, as well as through journaling and writing about their predictions, reasons and ideas on the subject. Overall, using data in a science lesson engages the students, allows a deeper level of thinking and real-world application, and assists with the integration of multiple content areas.