Engaging Contexts Data Integration

Ashley Nicol

Endeavor Methods of STEM Education--Elementary

a) Data Source:

National Hurricane Center Past Seasonal Tracking Data:

https://www.nhc.noaa.gov/data/tracks/tracks-at-2018.png

https://www.nhc.noaa.gov/tracking_charts.shtml

b) Lesson Enhancement:

I currently teach a unit on how Earth's systems interact. Throughout the course of the unit, the class looks at a variety of interactions, including the water cycle, erosion, food webs, and gas cycles. By adding this new data set, the class can now take a deeper dive into hurricanes particularly to really study the nuances of a huge interaction of Earth's systems. Depending on when the unit it taught, it may not be hurricane season, so having access to past tracking data through the National Hurricane Center will allow the class to work with real data anyway. Using blank tracking forms provided through the National Oceanic and Atmospheric Administration will also allow students to become actively engaged in collecting and marking the data, allowing them to see patterns and analyze as they work.

Personally, I think it is of great importance to include data while teaching science. Students spend a significant amount of time collecting their own data within the context of the classroom. Presenting data from other scientists sends an important message that this is not just something children do as part of class, it is a vital part of scientific study. By using real data within the classroom, students also gain insights on the importance of specific and carefully collected information, and can greatly enhance their learning through sources that would be impossible to replicate at school. Most importantly, I do not see how Next Generation Science Standards can be taught properly without the

incorporation of data. For example, while practices such as analyzing and interpreting data can be done with what is collected in class, it is unlikely that all the types of data needed to understand all the core ideas of a grade level can be gathered at school. Likewise, many of the crosscutting concepts such as patterns, scale and quantity, energy and matter flows, and stability and change would require long-term investigations that could not feasibly be completed within a unit or school year.

c) Interdisciplinary Context:

By adding this data and thus the surrounding lessons about hurricanes, the current unit on system interactions will become much more interdisciplinary. One of the students' reading units is on severe weather, which includes hurricanes. By completing the lessons and discussions with their reading teacher, students will have much more background knowledge for the science unit. This will allow the class to spend more time on higher level scientific exploration instead of reading about and building basic information. Since hurricanes have such an impact on humans, adding data where storms reach inhabited places also allows the class to study additional standards about human interactions with the environment. Students can discuss what humans can do to protect themselves from the effects of hurricanes and what measures can be taken to protect fragile resources. Engineering could be tied in as students design solutions to protect the environment or personal property. Finally, in graphing the storms, students will work with coordinate planes, a mathematics standard for fifth grade that often gets left off until the end of the year due to time constraints. Now, the topic can be taught in a real-world context.