Data Integration
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Data site: NOAA Coral Reef Watch
https://coralreefwatch.noaa.gov/satellite/vs/index.php

This website shows real time data for coral reefs around the world. The data indicates if the reef is in danger of a bleaching event. This will be integrated in a lesson about coral bleaching and reef ecology. Past data for each reef can also be seen in order to establish normal cycles and levels. The website changes daily so having the students looking at past trends is essential, especially for my class when not all students are doing lessons on the same day. Adding this site to my lesson also bring in Math concepts to my Marine Biology topic of coral reefs. It also makes the lesson more student driven and creates an opportunity for critical thinking.

My goal this year is to integrate more data into as many lessons as I can. I do believe that real data makes lessons more relevant to students even if it is not normally a part of their lives. Students are more likely to engage in the material if they see evidence of it happening and are more likely to remember the affect if they collect data themselves. Data can be more meaningful when created and collected by the students themselves but this can often be difficult without using "cookie cutter" labs. I often run into the problem where students will conduct a lab that they design themselves but the data they collect leads them to incorrect conclusions. It is then difficult to get past the misconceptions they created. It can also be meaningful to use reliable existing data, such as from NASA or NOAA. There is so much data on many topics available to the public. That being said, it is often raw data that is difficult to interpret and very time consuming to create lessons plans around. Students must have the background knowledge necessary to understand what the data means without giving away the expectations. Being able to interpret data and evaluate the validity of data is a necessary part of being a productive citizen.

Another benefit of data based lessons is the fact that it is a part of all STEM lessons. In fact, data could arguably be the main factor that ties all of the parts together. Analyzing the data is a great way to bring Math into a science lesson, or vice versa. Especially when creating/evaluating graphs or using formulas to interpret data. The above website mainly uses graphs to express the information. Students must be able to read the graphs, use the keys, and have the background knowledge to know what they are looking at. Appropriate technology must be used, or understood, when collecting data. And data collection is non-stop during engineering creation in order for students to test and redesign. Students must be able to evaluate a prototype and make data-driven decisions when designing an engineering project.
Data-driven arguments bring in literacy and writing skills which brings in cross-curricular topics.