

Writing from Data: a NASA resource PD

The title of my STEM professional development is: Writing from Data. I selected this topic to address gaps in performance in writing and data analysis on my current campus. Across the grade levels, the students' areas of low performance on reading and understanding graphs and tables is evident on classroom as well as state assessments. In addition, writing is a weak area on the state assessment and our students struggle to write cohesive, coherent, longer pieces. In order to bridge both of these gaps, I plan to use some of the NASA resources for data I learned through Endeavor as well as using writing stems from the book Writing in Science, to focus on writing from the data.

This PD integrates NASA resources that support many of the state standards taught K-5. First, using information from the Tracking Marine Mammals course, using ACES to track marine mammals and examine data on sea surface temperature, animal migration, and sea floor depth. The PD will also use resources gained from the Astronomy and Space Science course such as NASA Earth Observatory data, and the NASA Space Place webpage. The PD will include how to find lesson plans from NASA JPL and interact with data from that NASA base. Articles shared from the Endeavor M in STEM course about the importance of the use of authentic data will also be included, and using authentic data will be a key point of this PD, focused on data from NASA that connects to learning standards. All of the data pulled from these sites will be used to show teachers how to model writing from data and use transition words to strengthen their writing skills as they see how to teach students how to talk about the data collected.

The proposed audience is teachers from my campus, which serves students in grades K-5. The activities and resources can be scaffolded to any grade level, and to fit standards for multiple grades. For example, the ACES site can be used with the youngest learners to look at weather and animal habitats before increasing the rigor to looking at structure and function that helps animals survive certain sea surface temperatures. In the older grades, they can also explore changing weather patterns and the effects of the sun on temperature and animal migration patterns. The NASA Space Place site as well as Earth Observatory have a plethora of information that can be used across the grade levels, as well. Showing how to incorporate these resources into the lessons and standards through writing will be applicable to all grade levels. There are approximately 65 classroom teachers on campus, who teach a student body of around 850 students. The teachers are blocked and teach either math and science, or the English language arts, but this PD would be aimed at all subject areas and integrating NASA data and resources through writing about the data.

This PD and resources would address NGSS standards as well as the Texas standards since Texas does not employ the use of Common Core. The use of authentic NASA data can replace made up data and create real-world connections for the students, thereby making it more meaningful. The NGSS standards addressed would include:

The initial session will last one hour for the initial occurrence, with follow-up sessions to come later as follow-up and lasting 30-45 minutes. The audience will be recruited via e-mails and flyers within the school message board in faculty rooms and staff areas. There will also be social media posts on a staff-only group to invite those who are currently working off campus due to Corona virus.

In order to understand what knowledge teachers already have about the topic, the survey before the PD will use a number scale for teachers to self-assess their level of comfort with using data in the classroom, writing about data, and their knowledge of NASA resources available. It will also include open short answer questions regarding what teachers hope to improve on after the PD, as well as how they currently use data in the classroom. In addition, it will list some of the NASA resources available to educators and ask teachers to indicate the ones they are familiar with. At the end of the PD, the teachers will be given the same numbered scale to self-assess their comfort with using data in the classroom, writing about data, and their knowledge of NASA resources available. There will be open-ended questions allowing them to indicate what they learned as well as how they will implement the learning going forward, and asking what support they need to implement it in their classroom.

Outcomes for this PD include teachers gaining knowledge of how to find authentic data from NASA sites and resources to incorporate into their lessons. In doing so, they will understand how to increase real-world connections and making data meaningful to students, while using it to help solidify concepts being learned in classes they teach. Through this PD, I hope to help educators grow more comfortable teaching students how to analyze graphs, tables, and charts and incorporate them into daily lessons more often. This will have an effect not only on teacher confidence, but on helping students be more comfortable seeing and interpreting data in many forms, all while connecting to the concepts being taught and engaging students with real-time and real-world information. Through showing how to take this data and giving educators attending the PD a simple to implement strategy of using sentence stems, I hope to help teachers understand the ease with which they can bring NASA resources and data into the classroom and heighten student engagement and understandings. I would hope the involved participants would leave the PD ready to incorporate NASA resources into their lessons and be better able to understand how to make analyzing data meaningful to their students- instead of looking at made up information, they will walk away with ways to find tables and graphs that correlate to the state standards taught in math and science, but be able to also incorporate writing to build student skills in multiple academic areas of concern. Teachers will see how to facilitate deeper discussions of data and how to easily transition from oral discussions to written in any grade level using sentence stems to help students analyze the engaging data from NASA.

Follow-up with teachers in attendance will take the form of a survey sent out 2-3 weeks after the PD to enquire about what they have incorporated into the classroom since the PD, and what further training they would need to continue their growth. Individual conversations and interviews will also be conducted with those willing to do so either face to face or over a virtual meeting on Microsoft Teams, and with the 3rd grade team specifically as we plan together. There will also be an opportunity for follow-up sessions for support and new learning to look deeper into the NASA resources available and how to incorporate them in specific grades or classes. Attendees will also be encouraged to e-mail me with any questions or for help finding data to incorporate into their specific lessons and content.

The pre- and post-PD surveys will be used to analyze the success of the event, as well as verbal feedback in the form of individual or small group interviews with participants. In addition, an online form will be given to teachers to fill out regarding how implementing the NASA resources and data went in their classrooms. Looking at historical data on assessments that include analyzing data and comparing them to those given after these changes are implemented will also be used to see how this PD affects the efficacy of lessons.