

1. Mini Professional Development Project Title

The title of my mini professional development presentation is “Understanding the Relationship between the Seasons and the Sun.”

2. Justification. (Why did you select the topic?)

I selected this topic because when teaching Earth Science, an essential component is that students understand how the apparent path of the sun changes on a yearly basis, what impacts we see on Earth because of the changing position of the sun striking the surface, and how studying the sun in the past has influenced people, cultures, and entire civilizations. The NASA lesson asset that I selected to help teach this concept was chosen because it highlights the connections between math and science and the cross-curricular content that students learn in both courses to help build their STEM foundation. Generating lessons that have students make these connections across disciplines is an important step to making students STEM literate and was also a main focus for us to incorporate into our teaching practices that I learned in my methods of STEM education class. By using this lesson that incorporates both math and science to explain the positions of the sun and celestial observations, I am going to show my students how math and science are connected together to understand such basic principles like observations of the sun on a yearly path. Another reason why I selected this NASA asset is because it will be an essential component of the Explore phase of the 5E lesson plan model which was something I also learned in my methods of STEM education course and have started implementing into my classroom teaching practices. The 5E lesson plan model helps students build the connections and interact hands on with phenomena to help them explain the natural world around them. This NASA asset has students explore angles and angular relationships to help generate connections between celestial observations, the apparent path of the sun, and what we see on earth because of these apparent celestial changes. Another reason why I selected this topic because I think it will be useful and applicable for teachers who teach Physics and physical science because they also make connections between math and science, and this NASA asset and lesson plan helps engage students in exploring that relationship while also learning about an interesting topic that ancient astronomers and mathematicians were studying hundreds of years ago. Additionally, connections could be made to social studies content areas when students are learning about ancient civilizations and how they survived, thrived, and prospered utilizing these celestial observations.

3. School Name(s), Number of Educators, Grade Level(s)

This mini professional development will be presented to members of the Rye High School and Rye Middle School science department. There are 24 members of the science department covering grades 6-12. The department offers courses in: 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grade science as well as Living Environment, Earth Science, Chemistry, Physics, Science Research, Engineering Courses, Forensics and a variety of AP Courses.

4. Brief Summary of Project (What did you do with teachers?). Include how the project indicates the integration of NASA assets and STEM content and pedagogy learned through Endeavor.

When I am giving the mini professional development I plan to take some time explaining the NASA asset, its connections to the Earth Science curriculum, as well as prior knowledge and content in mathematics the students will need to be successful. For younger grade levels/different mathematical ability levels I will also explain some modifications that can be done to adapt the lesson for the various types of learners in the classroom. Next I will explain the importance of helping students build STEM connections across different content areas and that it is an important role of the teacher to help facilitate students in making these connections. I will share some resources from my methods of STEM education class to show teachers how to make these connections and the benefits of making them to enhance student learning. In addition I will explain the 5E lesson plan model and how it should be incorporated to allow students the opportunity to explore phenomena and make their own connections to their learning and the content. I will share examples of 5E lesson plans I have made and work through the process of how 5E style lessons lead to enhanced student engagement as well as increased student participation, focus, and learning. The methods of STEM education class provided me with great examples and resources for how to generate engaging lessons that would better my teaching practices and I am going to share that with my colleagues as well. Lastly, I will share the NASA website and other NASA assets that are related to Earth Science and provide those resources to my colleagues as well.

5. Reflection (How did teachers respond to your PD? What feedback did they give you on the content and pedagogy?)
6. Include name, title, and contact information of two educators who attended the PD.

Resources:

NASA lesson titled “Ancient Observatories: Timeless Knowledge Activities” found here: [https://sunearthday.gsfc.nasa.gov/2005/educators/AOTK\\_lessons.pdf](https://sunearthday.gsfc.nasa.gov/2005/educators/AOTK_lessons.pdf)