The professional development session I am planning will be titled: “Developing cross-curricular lessons in math and science using authentic data and problem-based learning” I chose this topic because, as an elementary division, teachers know our math program lacks meaningful, authentic tasks and we know our students are in great need of them. Our science curriculum is antiquated, lacks authenticity, meaningful connections, and is not aligned with NGSS or our state standards. Additionally my district is at the beginning stages of a major curriculum overhaul with a 21st Century focus driven by Heidi Jacobs’ book, “Bold Moves”. I wanted to design my PD to meet both the needs of the teachers in my building, share the coursework I’ve experienced through the Endeavor program, and to correlate with my district’s curricular focus all in attempt to provide higher-quality instruction and more authentic learning experiences to our students.

My professional development session will provide a wide range of NASA resources for math and science content. Additionally, I will share my 5E lesson plan template, and sample lessons I’ve written throughout my course work highlighting specific elements - phenomenon, meaningful cross-curricular connections, problem-based learning examples, and authentic discovery elements. I will be presenting to half of the upper elementary division at York Suburban School district. The 3rd, 4th, and 5th grade teachers at Indian Rock Elementary School teach all subject areas and typically service between 20 and 24 students each. I’m hoping to also present to our specialists- learning support, reading support, math support, gifted, autistic support, wellness, media literacy, art, music, discovery and design, and my principal.

My resources will primarily focus on the collection, interpretation, and display of data and how science and math instruction meet in this way. Cross-cutting Concepts, Disciplinary Core Ideas, Science and Engineering Practices, and mathematical practices will be shared to show the relevance of this integration. Through the practice of collecting and use of data for interpretation within meaningful science lessons, less time will need to be spent teaching how to display and use data within the math curriculum. A deeper, more authentic understanding of data interpretation will result.
Standards addressed will include:

Mathematical Practices

MP.2 Reason abstractly and quantitatively

MP.4 Model with mathematics

MP.5 Use appropriate tools strategically

MP.6 Attend to Precision

Science and Engineering Practices

Asking Questions and Defining Problems

Planning and Carrying Out Investigations

Analyzing and interpreting data Using Mathematics and Computational Thinking

Obtaining, evaluating, and communicating information

Crosscutting Concepts

1. Patterns.

2. Cause and effect:

3. Scale, proportion, and quantity.

Disciplinary Core ideas

ESS: Earth and Space Science

ESS2: Earth's systems

ESS3: Earth and Human activity

PS: Physical Science

PS1: Matter and Its Interactions

My professional development session will be held in the Indian Rock library using google slides, and google classroom as a sharing platform. The session will be held for one hour on the afternoon of November 11th, on a planned PD inservice day for the elementary division. Teachers will have the opportunity to choose from different PD sessions during that afternoon - mine will be one of the offerings. Teachers will have access to their curriculum materials and their laptops.

In general, my pre-survey and post-survey will ask what the greatest obstacle to teaching cross-curricular problem-based/authentic learning activities is, what benefits teachers see for students with that particular approach, identify teachers' personal feelings about STEM instruction, and their comfortability with implementation. I'm hoping to grow teachers' willingness to explore new resources and teaching styles, and encourage the creation of a high-quality lesson bank for authentic, problem-based, cross-curricular lessons that are both easily adaptable and ready to implement. I plan to follow up with teachers via a google survey, email communications to answer questions, and through comments on our google classroom site for lesson and/or resource sharing.

To analyze the success of my professional development session, I will view our google classroom looking for lesson/idea collection posted by participants and encourage the sharing of lesson feedback. I'm hoping to encourage staff to add favorite resources, grade-level concepts taught that correlate to resources, and recognize time saving activities that accomplish goals across multiple subject areas. Unfortunately, the date my principal offered me to share my PD plan is very late in the semester, so my participants won't have much time to post experiences with the new resources I have to share. I'm hoping to elicit at least two entries from each participant.