

STEM Professional Development Proposal: Endeavor Leadership Spring 2020

Sarah Woodward

• What is the title of your STEM professional development?

Using the 5E Lesson Plan Model to Engage Learners

• Why did you select the topic?

After mentioning the 5E lesson plan model to my principal during a post-observation meeting earlier this school year, she said she had never heard of it. I have used the model on and off during my undergrad classes, but more consistently during my Endeavor courses. As I used it more, I was able to get myself and my students into more of a routine with our lesson format that went beyond direct instruction. This sense of routine paired with my students' engagement was noticeable to my principal during my observation, and was highlighted as a strength. After explaining the model to my principal, she mentioned how it would be a great model for some of my peers, and that she'd love to have me help get more people on board with using it.

• How does your PD integrate NASA assets and/or content from the Endeavor courses?

Before beginning the meat of the PD presentation, I plan on giving a quick overview of my experience with the Endeavor program along with some of my personal highlights from the courses I've taken. This will serve to establish myself as a STEM leader while also mentioning some incredible resources available to educators, such as the Signals of Spring ACES program, to get them engaged. I plan on modelling my own process using the 5E lesson model by using an activity I gathered from the JPL resource page: "Planetary (Egg) Wobble and Newton's First Law" (<https://www.jpl.nasa.gov/edu/teach/activity/planetary-egg-wobble-and-newtons-first-law/>)

I will have my coworkers work through an expedited version of this lesson to experience it firsthand. After they experience a 5E lesson, I will show them other examples of model lessons that I've written for my Endeavor courses that span multiple days instead of just one, and one of my 5E unit plans all of which used NASA resources.

• Who is your proposed audience (minimum 12)? Which teachers will you serve with your PD and activities? What grades, subjects, and how many students do they teach?

My PD will replace our March staff meeting, so my school's entire teaching staff will be in attendance. This will likely include all 19 teachers of our 308 preK-8th graders, so elementary classroom teachers as well as content-specific middle school teachers in all subjects. Our principal, and three learning resource staff members will most likely also be present.

• What STEM concepts or learning goals will you and your materials address which can potentially replace other classroom activities?

The JPL Activity specifically addresses Newton's 1st Law, and the following NGSS standards: MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

3.PS2.1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

In a more broad sense, using the 5E lesson plan model also addresses the following NOS themes:

- Science investigations begin with a question. (K-2nd grade)
- Scientists search for cause and effect relationships to explain natural events. (3-5th grade)
- Science explanations describe the mechanisms for natural events. (Middle School)

• **How and where do you intend to carry out your PD? How long will the session be? When will it be held? Will teachers have access to computers?**

This will be held after school on the first Monday of March in my classroom for approximately an hour. I expect that the actual presentation will be an hour, but I will make myself available afterwards to help guide interested teachers through some of the specific NASA resources mentioned. Staff will be encouraged to bring their computers to complete the post-PD survey as well as to explore the NASA resources with me after the presentation is officially completed.

• **What, in general, will your pre-survey and post-survey ask?**

Pre Survey questions (to be sent and completed a week in advance of the PD to allow for me to adjust based on responses)

- Have you ever heard of the 5E lesson plan model?
- What does your lesson planning routine look like currently?
- Have you ever used a phenomenon to engage students at the start of a lesson?
- What are some hallmarks of some of your most successful lessons to date?

Post-Survey questions:

- How likely are you to use pieces from the 5E model moving forward?
- How likely are you to use phenomena-based hooks to your lessons in the future?
- How likely are you to investigate NASA resources for use in future lessons?
- What was your biggest take-away from this PD?

• **What outcomes or expectations do you hope to see for your educators?**

I hope that teachers will leave my PD feeling more empowered in their ability to better engage their students through the use of real-world phenomena, current events, and high-interest topics such as NASA missions. I also hope that teachers can apply the 5E model to at least one lesson or unit plan in the near future.

• **How will you follow up with the teachers in attendance?**

A week or two after the PD, I plan on emailing the staff who attended to see whether anyone has actually written a lesson plan or unit plan with the 5E model, or if anyone has used a NASA resources that was mentioned during the PD. I will also offer up the ability to set up 1-on-1 meetings with me to co-plan lessons (likely with my middle school co workers in the other content areas) or to support elementary teachers in planning their next science lessons or units.

• **What data collection methods (e.g. surveys, interviews) will you use to analyze the PD's success?**

I plan on using pre and post surveys, as well as having teachers provide me with artifacts such as lesson plans or pre/post assessments completed by students in response to a lesson planned using the 5E model.