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Stem Leadership SCED 545  
Professional Development Proposal  
M. Holzer, PhD  
02 February 2023

**Title of Project:**

Integrating 5E inquiry science approach lessons into the Science Classrooms

**Why did you select the topic?:**

I chose to design a professional development over using the inquiry science approach of the 5E instructional model. The reason I chose this topic is that many of the teachers that are in my district have never used the 5E approach when designing their lessons.

**NASA or Endeavor content:**

I will use the MY NASA Data site to introduce the teachers to a 5E lesson and other sites to demonstrate and explain how 5E lesson work, such as the NGSS site for 5E Model of Instructions. In addition, I will be using a 5E lesson that I designed to demonstrate to the teachers how to write their own but, more importantly, where to find them already written from their use.

**Propose audience:**

The audience for the professional development will be Sweet Springs R-7 elementary teachers and middle school focusing mainly on science.

**Learning Goals:**

The learning goal for this professional development is to introduce the 5E inquiry science instructional model to the teachers. It includes five phases: Engagement, Exploration, Elaboration, and Evaluation. The purpose of the 5E Model is to place students at the center of learning and help them construct an understanding of science concepts.

**Learning Goals for student Lessons:**

- Analyze changes in glacier coverage over time using satellite images.
- View global climate models to predict future climate changes.
- Interpret and summarize quantitative data,
- Receive real experience with the topic.
- Make observations, record results, and make connections.

**NGSS Standards:**

**Math Standards:**

- NM-ALG.9-12.3 Use Mathematical Models to Represent and Understand Quantitative Relationships

**Science Standards:**

- HS-ESS2-2: Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems
- HS-ESS3-6: Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
- HS-ESS2-4. Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
- HS-ESS2-7. Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.
- HS-ESS3-5: Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

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- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

### **Session Length and audience:**

The length of the professional development will be approximately an hour in length on one of our professional development Mondays. I have asked the elementary principal about hosting the professional development for the elementary teachers, and I asked the junior high science teacher if she would like to participate.

The participants for the professional development will be third through ninth grade science teachers from Sweet Springs R-1 school in Sweet Springs, Missouri. Sweet Springs is a rural school with approximately 400 students from preschool through twelfth grade.

### **Surveys:**

I plan to use pre and post-survey questions and interviews a few weeks after the professional development to see if the teachers are using the material covered or if they have any questions.

### **Pre-Survey Questions:**

How many years have you been teaching science?

Do you have a science background?

How familiar are you with the 5E inquiry approach to teaching science?

Have you ever used any NASA sites in your teaching? If so, which ones?

What are some science topics that you would like to be covered during the PD?

What type of professional development do you prefer? Active or passive?

### **Post-Survey Questions:**

Was the professional development helpful? If so, what aspect of it helped you?

What are some ways professional development could be improved?

Would you be interested in participating in an interview in a few weeks to discuss the information in more detail?

### **Outcomes:**

Outcomes I hope to see from the teachers after the professional development is them using the information about the NASA websites and 5E inquiry learning in their classrooms.

### **Follow-up:**

I plan to follow up with a post-survey questionnaire and an interview with the teachers to see if they have more questions or need more information to use in their classrooms.

### **Data Collection Methods:**

I plan to use Survey Monkey as a data collection tool and conduct personal interviews a few weeks after the professional development.