

PD Proposal - Jesiah Jeffers
Spring Semester 2020 - Endeavor Program

Title: Using STEM to Collaborate

• Why did you select the topic?

Our building struggles with collaboration. I want to take this PD opportunity to explore how to use STEM ideas and lessons to collaborate. I want to demonstrate collaboration lessons within the same department and cross-curricular. This will also be a great opportunity for teachers to acquire valuable STEM resources and get a chance to explore a couple of those resources for themselves.

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

I will use the E in STEM as a focal point for the examples of lessons. For my Engineering Endeavor course, I designed a Geometry Lesson that incorporates technology, science, and art. I will show them this lesson and show how the NASA Engineering Design Process can be used to structure STEM lessons from different fields of study.

• 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 audience will be our teaching staff at the high school. This includes 20 teachers of our electives, language arts, math, science, and social studies departments. We have about 280 students in our high school with an average of 20 students or so per class.

• What STEM concepts or learning goals will you and your materials address which can potentially replace other classroom activities? List NGSS and CCSS or your state standards.

I will be using NASA's BEST engineering design process:

- **ASK:** Students identify the problem, requirements that must be met, and constraints that must be considered.
- **IMAGINE:** Students brainstorm solutions and research ideas. They also identify what others have done.
- **PLAN:** Students choose two to three of the best ideas from their brainstormed list and sketch possible designs, ultimately choosing a single design to prototype.
- **CREATE:** Students build a working model, or prototype, that aligns with design requirements and that is within design constraints.
- **TEST:** Students evaluate the solution through testing; they collect and analyze data; they summarize strengths and weaknesses of their design that were revealed during testing.
- **IMPROVE:** Based on the results of their tests, students make improvements on their design. They also identify changes they will make and justify their revisions.

CO Math Standards:

G-SRT.B.5 - Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

G-CO.D.12 - Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.)

Common Core State Standards Connections:

ELA/Literacy -

RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. (HS-ETS1-1),(HS-ETS1-3)

RST.11-12.9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible. (HS-ETS1-1),(HS-ETS1-3)

Mathematics -

MP.2 Reason abstractly and quantitatively. (HS-ETS1-1),(HS-ETS1-3),(HS-ETS1-4)

MP.4 Model with mathematics. (HS-ETS1-1),(HS-ETS1-2),(HS-ETS1-3),(HS-ETS1-4)

- **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?**

We have a teacher in-service day on Friday, March 13th. I intend to do the PD at the beginning of the day for our staff and I believe it will take somewhere between 1 and 2 hours. It will be done in the computer lab where all teachers will have access to a computer.

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

I will ask some diagnostic questions about STEM in general as well as the engineering design process. I will also ask some questions about the level of collaboration between teachers.

- **What outcomes or expectation do you hope to see for your educators?**

I would like our educators to leave with a demonstration and chance to collaborate among themselves using STEM resources that I provide with a backdrop of the engineering design process.

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

I will do a follow up survey at the end of the year to see if they used the lesson that they designed during my PD and if so some follow up questions of how it went.

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

I will be using a pre and post PD survey to analyze the success of the PD.