

Charlene Parsons  
Leadership Proposal

## **Leadership PD Proposal**

### **What is the title of your STEM professional development?**

On the Moon

### **How did you select the topic?**

I teach at a STEM charter school on the campus of a local Museum of archaeology and paleontology. We have a fairly small middle school and high school with about 120 students per grade level. I feel like we have so many options available to engage students in real-world opportunities and community connections, but we sometimes get stuck in the monotony of living up to our reputation of high API scores. Our middle school schedule consists of 4 honors-level core classes before lunch- Math, Science, English and Social Studies, and a “Lab” class after lunch. We have 4 core teachers for each grade level, and therefore 4 different “Labs” that students rotate through in 9 week increments. The lab period is customized entirely by the teachers, we’re allowed to choose what we want to teach. On the 6th grade level we typically offer Robotics, Archaeology, Coding and Engineering/Art. In the 5 years I have been teaching at this school, I am one of only two middle school teachers who have ever changed up our labs. I alternate between Forensics, Engineering, and Art (which consist of knitting in morse code, and sewing LEDs and circuits into quilting projects). The other ten middle school teachers have been teaching the same curriculum for years. On the 6th grade level, some of the teachers get so bored themselves, they spend at least one lab period a week watching Expedition Unknown videos, and another as a study hall.

Some of my favorite NASA resources are the NASA/Design Squad Engineering Challenges. I had my lab complete the entire On the Moon challenge one year. My goal with this PD is to convince other middle teachers that it would be easy and fun to incorporate a NASA/Design Squad Engineering Challenge into their Lab curriculum once a week. I tend to be overly ambitious, so it’s my hope that once we’re back on campus we can turn it into a middle-school wide Friday challenge where we gather all of the middle schoolers into the Piazza (our courtyard-like area on campus) to compete together. Additionally, our Museum offers these activities called Science Saturdays once a month to bring local children on campus to engage in hands-on science and engineering activities. I’d like to maybe collaborate with the Museum to have some of our middle schoolers, maybe the winners of the school challenges, lead the Engineering Challenges on Science Saturdays.

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

I plan to use the NASA/Design Squad On the Moon Engineering Challenges. Specifically Touchdown because I feel like I may be able to draw in some willing participants with the bribe of Marshmallow Astronauts.

### **Who is your proposed audience? Which teachers will you serve with your PD and activities? What grades, subjects, and how many students do they teach?**

My proposed audience are all of our school's middle school teachers. So, grades 6-8, English, Science, Math and Social Studies teachers. Each grade level has about 120 students.

**What STEM concepts or learning goals will you and your materials address which can potentially replace other classroom activities? (list NGSS, CCSS or state standards)**

My hope is that, even if teachers decide they don't want to do a school-wide challenge every Friday, they will at least consider offering a NASA/Design Squad Challenge to their Labs on a day they may feel tempted to put on a video or offer a study hall period. The challenges will be a great way for our school to show how we are incorporating engineering into our middle school curriculum.

These are the standards specifically for **Touchdown NGSS**

- MS-PS2: Motion and Stability: Forces and Interactions
- MS-PS3: Energy
- MS-ETS1: Engineering Design

CCSS Standards for Mathematical Practice

- MP1: Make sense of problems and persevere in solving them.
- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.

International Technology Education Association Content Standards (Grades 3–8)

Design

- Standard 2: Students will develop an understanding of the core concepts of technology.
- Standard 8: Students will develop an understanding of the attributes of design.
- Standard 9: Students will develop an understanding of engineering design.
- Standard 10: Students will develop an understanding of the role of troubleshooting, research and development, invention and innovation, and experimentation in problem solving.

Abilities for a Technological World

- Standard 11: Students will develop abilities to apply the design process.
- Standard 12: Students will develop abilities to use and maintain technological products and systems.

The Designed World

- Standard 16: Students will develop an understanding of and be able to select and use energy and power technologies.

**How long will the session be? How will you recruit your audience? Where will you advertise your PD session?**

Good question. School-wide we're having some teacher motivation issues right now when it comes to doing the "extras". I plan to mention it at our staff meeting and send a follow up email. I'm hoping if I offer to porch drop supplies they'll be willing to participate. Especially if

those supplies include some sort of “extra” motivation. If absolutely necessary, I am willing to use guilt and persuasion. I’m thinking the best I’m going to be able to get is a single one hour Zoom meeting for the challenge and one pre and post survey for each participant. I’m hoping I can also get a post interview from the other 3 6th grade teachers. If I can’t get enough teachers from my own school, I will persuade teacher friends from other schools.

**To demonstrate something new, you will generate a pre-and post survey. What in general will your pre-survey and post-survey ask?**

In my pre-survey I plan to ask questions revolving around how and why teachers chose the subject of the Lab they currently teach, how they design their curriculum, where they found their curriculum resources, and how long they’ve been teaching that subject. I plan to ask them how they integrate STEM concepts to make it a true STEM lab. I also want to ask them what they feel the true intention of the lab period is, and their feelings on the lab period in general. I want to nicely ask if they feel like they are teaching their lab class successfully, or if they are bored and feel like there is something else they can be doing to make it a better use of their time.

In my post-survey I plan to ask a lot of questions about how they felt about the experience, how they can see these activities benefiting their lab classes, and what opinions they have on doing them school-wide. I feel like if I’m willing to plan the school-wide challenges, they’ll be willing to engage in them.

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

Actually, now that we’ve spent almost a full year teaching virtually, I’m thinking my middle school coworkers will be more willing to participate in weekly school-wide challenges once we are back on campus because it will allow for some socialization and collaboration that we’ve severely missed this year. Maybe it’ll help redevelop a sense of school community, especially with our current sixth graders that we’ve never even met in person.

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

Email. Maybe I’ll also be able to follow up in one of our staff meetings.

**What data collection methods (surveys, interviews, etc.) will you use to analyze the PD’s success?**

I’d like to use a combination of surveys and interviews. I like the idea of making a Google Classroom where I can ask participants to post photos and/or videos of the process since I won’t physically be in the room with them.