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Revised STEM Leadership Proposal Submission

The PD I am offering will focus on science instruction in an elementary school setting in Richmond, California. The title of the professional development will be Mystery Science. It will combine pedagogy from my district's use of Mystery Science curriculum and concepts taught in the Methods of STEM and Mars Exploration courses. It will be for the TK-5 staff in the afternoon on a minimum day during the contracted teaching hours on September 26th. It will be held in the teacher's lounge of the school and teachers will have their own computers. There will also be a projector for my slide presentation and tables for teachers to lesson plan in grade level groups as part of the PD.

The audience will be Downer Elementary School TK-5 teachers. It took me a few weeks to get an appointment with any principal to book this PD. Luckily Downer is interested. There are 22 total teachers, about 3 in each grade level. Several teachers are brand new teachers this school year. They are all multiple subject elementary level teachers. K-3 dismisses earlier and gets daily 20 minute prep whereas upper grades get two fifty minute preps per week. All schools in the district have a minimum day schedule on Wednesdays for teacher collaboration, PLC's, and other PD's.

My current role at West Contra Costa Unified School District is Elementary STEM Coach. This is all K-5 science and K-3 math for 34 elementary schools. I'm the only person in this specific role. There are 3 other math coaches who focus on upper grades, two other science coaches who also focus on upper grades, and three ed tech folks. That's it for an entire district. We're busy to say the least! Schools who receive most of our attention are under performing serving students in low income areas. A district goal from our new superintendent is for 80% of African American students to be proficient in math by 6th grade. For this project I'll work with the district Science Instructional Specialist to present this science training. I originally thought I would have a math training, but based on school needs it will be a specific NGSS curriculum training and I'll get a chance to share some great NASA resources to support this curriculum with the whole school when I review a 5E lesson plan. I'm going to share my final unit from the Exploring Mars class completed in the 5E format. Most activities came from a downloadable packet from JPL. I'll choose a few favorites and show the teachers some examples they can use in their elementary classrooms immediately.

Mars Activities PDF <https://mars.nasa.gov/mer/classroom/pdfs/MSIP-MarsActivities.pdf>
Landforms Unit

<https://docs.google.com/document/d/1UGTAAIjc36BUEC9WVEp2F2dRrcgo0VcjO3-yhdiJweY/e/dit?usp=sharing>

The Mars Exploration course I took through the NASA Endeavor program offered many resources for all grade levels. I plan on showing the staff these resources as a way to make real life connections, solve real world problems, and use real data. There is a wealth of real life applications of science on the course resource page.

Mars Exploration resource page

<http://www.us-satellite.net/nasa/endeavor/resources/marslinks.html>

The most general concept behind Mystery Science curriculum is phenomena-based

instruction. Each lesson begins with an exciting video that inspires curiosity in the students. It is usually dramatic but can also just be interesting. It follows the 5E lesson plan format of engaging the students at the onset of a unit. We use a saying that, “phenomena don’t have to be phenomenal.” The 4th and 5th grades now also have Unit Openers that guide an overarching theme throughout the unit. Another important feature about Mystery Science curriculum are the performance tasks. The “evaluation” or end of the unit is an engineering design project that solves a problem. These core values parallel what we learned in the Methods of STEM course.

Teachers in our district still need basic Next Generation Science Standard training. Although we spend time diving deep into a specific curriculum, I will spend time briefing teachers on the format of the new standards. We review the DCI’s, the SEP’s and CC’s. There are lots of connections with the Science and Engineering Practices in Mystery Science curriculum. The workshop is intended to train teachers on a curriculum, but I intend to bring up the SEP’s when appropriate to connect to NGSS. The SEP’s will also be a handout.

Mystery Science is excellent at incorporating 21st century skills of communication and collaboration, which we learned about in the Methods course. On our district webpage we have educational materials for teachers to learn about such topics if it is new to them. There are also district curriculum guides on the Science Instruction website. I will show the staff how to access the Mystery Science login page and more resources to enrich their Science instruction on the Science Instruction homepage for West Contra Costa. <https://www.wccusd.net/Page/3744>

The outcome I hope to see for the Downer teachers is a change in attitude about teaching science. I’d like to see teachers embrace the concept that they are life-long learners too. They might not necessarily be an expert on a subject, but that doesn’t make it off limits to teach. Talking about the Science and Engineering Practices and making an example of revising ideas will hopefully normalize everyone’s place in their development in the classroom. I expect the educators will mirror a typical classroom and have similar dynamics in group work.

For follow up, I will attend several teacher’s science classes to see these concepts in action and help model demonstration lessons for any teachers who would appreciate that kind of support. There may be a group of teachers that decide to focus on Next Generation Science Standards more than others, and I will coach those interested teachers throughout the school year. Additional resources can be emailed to the staff so they have a digital copy of the information and helpful links they can access when they’re ready. Participants in the workshop will be asked to complete a Google Form survey for me to analyze the workshop’s effectiveness. From the results, I can tailor a follow up workshop and/or alter the existing format to be better for the next school to which I offer the same PD. For the group of teachers I end up working most closely with, I will ask more questions in person to get more feedback.

The success of the PD will be evident in the quality of discussions we have during open planning time and in what we observe in the classrooms afterward. I will have Science and Engineering Practice posters printed to give out to the staff to post in their classrooms. Success would look like teachers referencing the posters on their own and encouraging a growth mindset in their students. Interviewing a few students would be another great way to measure the success of the workshop.