

STEM Leadership Seminar

Fall 2019

STEM Leadership PD Proposal

- I. The Creative Touch
- II. This past summer I attended a week-long Professional Development on infusing Arts into Judaic Studies. I was a part of this PD to enhance another project that I am a part of in my school. The learning model they used during this week was called Synectics. Synectics is an efficient group creative problem-solving process. There are 7-8 steps in this process always ending in an actual design implementation. At the beginning of the week, I had a lot of difficulty using my creative brain as I am more of a concrete thinker. As the week progressed, I was able to use the Synectics process to change my way of looking at different problems. As I was working on another project, I thought to myself that this creative thinking process lends itself to STEM. Whenever I do any STEM projects in my class the students have a very hard time being creative while trying to solve a specific problem. The more academic students have an especially difficult time. Giving time to the creative process will allow students to delve deeper into their imagination, thus creating more interesting and challenging projects. I would like to share those methods with my fellow colleagues who will in turn use it with their students.
- III. My PD will integrate the NASA Engineering Design Process. My main focus would be using the Synectics in conjunction with the EDP in order to give time to the creative process before they begin their STEM projects. This will allow the students to dig a little deeper into their creative psyche. All my Endeavor courses challenged my creativity.

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Engineering and design in STEM is something that has always been difficult for me. All the courses that I was a part of incorporated engineering and the creative process.

- IV. My proposed audience will be my science and STEM colleagues, however, since there are not that many science teachers in my school, I will offer the PD to any teacher that would like to participate. I work in a large Modern Orthodox Day School. My building is Pre K- 8. The Lower School science teachers instruct multiple grade a few times a week and the Middle School teachers instruct at least 80 students. Potentially, I may be able to have teachers of all subjects in the PD. After participating in this PD for an unrelated subject, I feel that all teachers from any discipline can benefit from this.
- V. My PD will use the creative thinking process to problem solve. They will use their ideas to complete an engineering project. Eventually, I would hope that this process can be used efficiently when students are working on a real-world issue in science. During the PD, I will demonstrate the process with a real-world problem. I will go through the steps with my colleagues, so they get a better understanding about how it works. Our school is trying to try out interdisciplinary lessons. Some topics may stand alone while others can be incorporated into the curriculum. My school has been successful in training a few teachers in STEM. It has been easier for the newer/younger teachers to incorporate this way of thinking into their lessons. Some of my science colleagues who are very set in their ways have been a little hesitant to incorporate STEM into their lessons. Because of the constraints of time and covering content, I find that teachers do not give students enough time to be creative. Often creativity needs to be thought about and not the first idea that pops into the head.

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The NGSS Standards that will be covered in this PD are:

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible

solutions **MS-ETS1-4.** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

VI. My PD would be about an hour in a teachers collaborative room or a classroom. It is difficult to find a time where I can invite all teachers to attend. I need to work it out with the principals if it can be done during lunch or at an after school staff meeting. The teachers will have access to Chromebooks if need be.

VII. I will administer a pre and post survey that will help with determining the level of knowledge my colleagues have on creativity.

Pre survey Questions:

1. What does creativity mean to you?
2. Do you think you are a creative person?
3. Is creativity inherited or learned?
4. Have you ever heard about the creative-thinking process?
5. If so? Do you know the steps?
6. Do you ever have any “aha” moments? And if so when and where do they usually happen?

Post Survey Questions

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7. Is creativity inherited or learned?
 8. Are you comfortable using the Creative-Thinking Process with your students?
 9. Is there a real world problem in your class that you can use the Creative Thinking Process?
 10. Are you able to combine the Creative Thinking Process with the Engineering Design Process in your classroom?
 11. Is there any topic or question that your students can utilize to begin the steps of the Creative Thinking Process?
 12. What do think will be the most difficult step of the process to complete?
 13. Which step will be the easiest?
 14. What outcomes or expectations do you hope to see for your educators
- VIII. I would hope that teachers would use the steps of creative thinking process in their long term projects. In the beginning, I would expect the teachers to do a large scale Synectics with their class. This would require them to have an idea or problem already somewhat set in their minds. They can go then through the steps as a whole class using a small group of students.
- IX. I would follow up with them by having teachers provide me with a brief summary of how they incorporated this into their classroom. If they need extra training on the steps prior to implementing I may meet with them privately. I will explain to the teachers that they can start slow with the steps of the Creative Thinking Process.
- X. I would provide teachers with a Google Forms to collect the pre and post data. I would like to compare their pre and post survey answers to guide them and see if there are areas they can use these Creative-Thinking Processes in their classroom. I would also have the

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teachers keep a log of their students' ideas and their steps in the creativity process. I will follow up by sending a detailed Google form to fill out that will have the teachers log the Synectics steps they used in their classroom.