

Las Cruces High School
Las Cruces, New Mexico
David T. Million, Teacher
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“Puzzling Pathways: Exploring new Approached to Teaching the Scientific Method,” \$730

1. Project Description

With the PNM Classroom Innovation Grant, freshman students in the Las Cruces High School Success Academy will be introduced to the scientific method through the use of puzzles. On the first day of this project, various wooden and wire puzzles will be set about the classroom. As students begin to explore various pathways to solving the puzzles in their respective learning circles, comparisons will be drawn between how the students approach the puzzles and how scientists explore various problems. As the project evolves, students will be introduced to the stages and terminology of the scientific method such as observation, prediction, hypothesis, variable, etc. through their hands on manipulation of the puzzles. When students' comfort level with the puzzles and approaches increase, the learning circles will begin to utilize a science journal to record inquiry methods as they look for patterns, develop models, utilize constants and variables, analyze their results, draw conclusions and try, try again to solve the increasing complexity of the puzzles. They will then use the knowledge they have constructed about the scientific method to explore other scientific "puzzles."

It is my hope that *Puzzling Pathways* stimulates my students' desire to know -- to be curious about the world around them. I also hope that students begin to recognize that their own unique perspectives and learning styles are assets in the world of science. These students who attend the Success Academy, a self-contained school within the larger Las Cruces High School, are students who generally have not met with much "success" in their previous educational experience. It is through these non-traditional educational approaches that utilize students' ability to construct knowledge through hands-on experiences that I hope to reach my students and develop their innate curiosity.

2. Project Objective

This project will:

- Introduce students to the scientific method and its corresponding terminology in a non-threatening environment.
- Encourage the use of alternative pathways and creative approaches to problem solving.
- Enable students to recognize their innate curiosity.
- Motivate students to become resilient and determined problem solvers.

3. **Project Evaluation**

The project will be evaluated in two ways. The first form of evaluation will be based on the students' work. Using a teacher-student generated rubric, I will evaluate my students' journal entries based on the use of the scientific method to solve the puzzle problem. Although the solution to the puzzle will be a small aspect of the evaluation, the primary emphasis will be on testing and retesting the hypothesis and the students' self-reflection that goes into that process. The second form of project evaluation will be my own self-evaluation. I will be observing my students' use of the scientific method as we move into other areas of science. I will view the project as a success if my students continue their process of inquiry into new areas of study.

4. **Community Awareness**

A newsletter describing the *Puzzling Pathways* project will be sent home. In that newsletter the PNM Foundation will be recognized as the sponsor for the project. At the end of the project, learning circles will prepare a "lesson" in the scientific method using the puzzles. The students will then share their lesson with local elementary students. At this time information regarding the PNM Foundation will be shared with the cooperating classrooms teachers, parents and students.

5. **Project Budget**

Wooden Puzzles (Levels 1-8)	275.00
Wire Puzzles (Levels 1-8)	185.00
Puzzle Manipulative (ex. Tangrams)	130.00
Puzzle Books	95.00
<u>Professional Books on Student Inquiry</u>	<u>50.00</u>

TOTAL \$735.00

No other funding sources are available for this project.