

How to Incorporate Agriculture into Family STEM Night

Senior Project by Hannah Kondratko
California Polytechnic University San Luis Obispo

Introduction

Family STEM Night is an evening for students and their families to come together and complete hands-on science, math, and engineering activities. This event will usually include a variety of interactive projects in different topics and connections to STEM careers. Incorporating agriculture science is a beneficial and productive way to connect people in the community to agriculture. The author will research the importance of agriculture in STEM, create and implement an agriculture-based STEM project to present at Monarch Grove Elementary School's STEM night in San Luis Obispo, California.

Background

The need for agriculture in STEM education is prevalent. When asking a child the question, "What is a farmer?" The clipart image of a man in overalls holding a pitchfork with a smile on his face is what often is described. Introducing children to the idea farmers not only grow food but do so by being engineers, mathematicians, and scientists may open the door into an interest in a field to which they had no prior knowledge.

Connecting content knowledge, STEM knowledge, real-world issues, and problem-solving skills are all interchangeable factors that play a role in both, (Stubbs & Meyers, 2015) Twenty-seven percent of the careers in agriculture, food, and natural resources are STEM (Soergel, 2015). Children are natural learners as they are inquisitive and eager to connect what they are taught to the world around them. Learning by doing comes effortlessly, especially in educational settings where they are given the opportunity to do so. All students have the opportunity to benefit from STEM programs. It allows them to explore greater depths of all subjects while it also encourages teamwork, knowledge application, tech use, problem-solving, and adaption, (Lynch, 2019).

Methodology

Monarch Grove Elementary school had a STEM night on February 21, 2020. After reaching out to Cal Poly faculty Dr. Delay, a student representative (author) was chosen to participate in the event connecting agriculture to STEM. The author then researched recommendations for choosing activities for a successful STEM night. Recommendations for stations included; quick and hands-on, under 10 min, accessible to all ages, shortlist of readily available materials, tri-fold for each station with additional information. The author will be making butter with students and their families. Participants will explore what happens to cream when it is shaken. The author then had to go out and gather supplies for this project. Supplies were gathered for both the butter making and tri-fold board. The author also typed and printed on what would be on the board. The research included the science behind making butter as well as supplies. The author also included farm facts relevant to dairies to help make the agriculture connection to families. It was written in simple terms so that any grade would be able to understand. On the day of the author arrived at 5:45 to prepare for the event that began at 6. The author set up tri-fold, the crackers, prepared cups with heavy whipping cream. During the event the author engaged with families, answered questions, and took photos of children participating in butter science.



Results

The butter science booth was a heavy traffic area as families navigated STEM night. Students were excited about being able to create and taste science. The sample cup was helpful for children to have a reference of when their own butter will be done. Students read the tri-fold board while shaking their butter and were able to understand the science behind it as well as make the farm to table connection from the Farm Facts section. Many teachers came up to compliment the project on its popularity and the author was asked to return next year.

Moving Forward

As successful as this project was, there were areas of it that could be improved. It is recommended to reach out for a proper estimate of how many families the school expects to participate in. Only about 50 people participated, so half of the supplies were needed. It is also recommended to have more than one representative go to the STEM night. It would be helpful as many children needed initials for their worksheets, help with the butter, or assistance with spreading it onto a cracker. To do all these things along with answering questions and explain the process would run much smoother with more than one representative. Lastly, the butter-making process itself took longer than most students wanted to stand there for. Next time this is done it could be helpful to bring an electric hand mixer, or having students pair up to make the process go faster. For data purposes, it would be helpful to have someone record the number of participants.

References:

- American Dairy Association (2018). 35 Undeniably Fun Facts About Dairy
- Elliot, K. (n.d). Is Ag the Answer to STEM? American Farm Bureau Foundation for Agriculture
- Fiorello, P. (n.d) Understanding the Basics of Stem Education
- Lynch, M. (2019). 7 Benefits of Stem Education
- Persaud, N. Boosting K-12 Agriculture Education & Its Relation to STEM
- Science Buddies (2013) Scrumptious Science: Shaking Up Butter
- Swafford, M (2018) The State of the Profession: STEM in Agricultural Education Journal of Agricultural Education 315 Volume 59, Issue 4, 2018
- Soergel, A (2015) STEM Skills a Necessity for 27 Percent of New Agriculture Jobs
- Stubbs & Myers (2015) Multiple Case Study of STEM in School-based Agricultural Education Journal of Agricultural Education 189 Volume 56, Issue 2, 2015
- STEM (n.d) Family Night Planning Guide