

Growing in SC: The Future of STEAM is Here

Final Report

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School/Organization: Saint Gregory the Great Catholic School

Grant Title: Heaven Scent: A Luffa Sponge Gourd Soap Project

1. Using the luffa sponge gourd soap project and connecting it to a real-world application of sustaining and expanding our school garden created opportunities for learners to work collaboratively on multiple occasions. From studying what luffas need to grow, designing a trellis system to support the luffas, solving garden problems, creating scents, to designing, marketing and selling, this project gave me a space to make connections between what I teach in language arts to science, technology, religion engineering, art, and math. It also created opportunities to make connections with professionals in STEM careers to interact with the students on a regular basis as they navigated the project.

The students used the close reading of complex texts to dive into articles about luffas to learn about their needs. They in turn used that knowledge to design a trellis system that would support the luffas during their 200-day growing cycle. The students did further research to solve garden problems such as fighting insects while keeping the garden organic and maintaining proper nutrient levels. They also did research to find natural bleaching solutions to lighten and brighten the luffas. They were then able to work in teams to seek solutions and report on their findings. They also worked collaboratively to calculate pricing, making sure that in the end there would be a profit.

We made connections with professionals in STEM careers who were able to give the students an inside look at how what they were learning through the projects connects to possible STEM careers. Dr. Art Martin, a member of our church community, reached out to offer his expertise. Dr. Martin developed an organic, plant-based, anti-pathogen product that is used world-wide to combat pathogens in many animal and plant farming applications. His product has also been helpful in combatting a foot fungus that is problematic in China. Dr. Martin has worked with our students to include Path-Away in their soap product, giving it an edge over other soap products that might be sold in our same market. Dr. Martin visited with the students on a regular basis to give mini lessons that connected the students' luffa project to real world applications. Dr. Martin has shared his eight-year struggle to develop his product, helped the students calculate the pathogens in their classroom, and taught them how to create the 1% Path-Away solution that would be used in their soap product. Dr. Martin brought in local soap makers Michael and Marilyn Keenan to give the students a lesson on the chemistry of creating scents. Michael and

Marilyn shared their knowledge of soapmaking and guided the students through a process to create and test scents. We also had a community member with a degree in marketing teach the students the principles of marketing and guided them through the marketing process. Twenty 6th grade students then went on to create their own products that will be sold at our Church Food Truck Festival. The 6th Grade Marketplace will enable our students to use what they learned through our STEM Grant project to spread their entrepreneurial wings.

2. In the end, the students collaboratively created a luffa soap product that was marketed and sold at our local Bluffton Farmers Market. The students sold out of their first batches of soap and then went on to create and sell additional soap. They have grossed over \$1,300 in sales so far, with more product and a plan to sell. They used research to make sound decisions, they used math to calculate cost and profit. They used language arts skills to market and promote their product in both Spanish and English. This was all possible through collaboration.; collaborating with peers as well as adult professionals in a variety of fields.

3. One big success is that the students learned how to rebound from failure and self-correct. They learned not to get discouraged and continue looking for solutions. They learned to celebrate each other's discoveries. The biggest challenges came from the garden itself. Luffas are difficult to grow. There are many challenges, ants being a huge problem. At the same time, those challenges gave us opportunity to bounce back from failure and move on to "Plan B". If the goal is to have a sustainable school garden, then our sales numbers offer the data needed to support that outcome. Continuing the project for a second year, tracking monthly sales will be a further test to see if it truly sustainable and not just first-time soap sales excitement. We will continue growing luffas and developing our line of soaps. We took notes throughout the growing season. We will use those notes to make changes in how we grow the luffas. We will keep fewer vines to avoid crowding and we will make adjustments to the trellis design to make the vines easier to maintain. It was important that every student in our school have their hands on this project. They each created luffa trellis garden designs, filled the planting beds, planted luffas, peeled harvested luffas, and bagged luffa seeds for future growth. They experimented with creating scents, made soap, and designed packaging. I am confident that our students can use specific language to talk about growing luffas and the melt and pour soap-making process. I am also confident that our older students have a working knowledge of the entrepreneurship component of this project. The proof will be noted in their post 6th Grade Marketplace report which is due after our Food Truck Festival/Business Fair.

4. Lessons learned are shared with colleagues during faculty meetings and PLC meetings. Pictures and activities are posted on our school's social media account. Fellow staff members have been positive and supportive. Our front office staff has even joyfully stepped in to help when students were unable to man the soap sales table in our entry foyer. I sent a survey to the faculty members in February to gather their input as to how each teacher could use the luffa garden and soap project to support their students' learning. A follow-up survey will be completed to make additions for our next school year.

5. When our 6th grade students were asked how collaborating with peers on a real-life project impacted their learning, most responses were about being able to communicate confidently about their product because they created it and having exposure to professionals in STEM careers. They also appreciated being able to sell their product among other business owners. They enjoyed being a part of the Bluffton Farmers Market community. They even made a connection with The Palmetto Ocean Conservancy to collect bottle caps and lids for a community mural being constructed in Bluffton to bring an awareness to keeping plastic out of the ocean. That connection is helping them to research an alternative to the plastic wrap they are now using for their soap product.