

Budding space farmers at Aspen Community School

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Savannah Baca, 12, a seventh grade student at Aspen Community School, earlier this month visits the school's greenhouse, where some iceberg lettuce seedlings planted by Aspen Community School's Garden Club are sprouting. Savannah and other students will begin work on the Growing Beyond Earth project this week.

Luis Sánchez Saturno/The New Mexican

Science teacher Micah Daboub was searching for something outside the same-old, same-old to engage his seventh and eighth grade students at Aspen Community School.

The tried-and-true practice of designing science fair projects wasn't going to cut it, Daboub said, especially in the throes of a pandemic. Instead, Daboub went deep into a teacher's bag of tricks — developing instructions for a laser-pointed “blow gun,” turning quizzes into video games and conducting an online dissection of a sheep's heart to keep students riveted to their computer screens.

“I can't get them excited about building another volcano, a potato battery or some science experiment that isn't going to get them a token, objective award,” Daboub said.

So Daboub found a “citizen science” program that could have more meaning for his students beyond the classroom. He signed up Aspen for the Growing Beyond Earth project, in which middle and high school students assist NASA in conducting science experiments on growing crops in space that might be suitable for long-term missions.

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Growing Beyond Earth is a partnership between Fairchild Tropical Botanic Garden in Coral Gables, Fla., and NASA's Exploration Research and Technology Programs. Amy Padolf, the director of education for Fairchild, said NASA funds the program, while her organization provides equipment, resources and training to schools free of charge.

Padolf said the program is a great way of improving science, technology, engineering and mathematics instruction — commonly referred to as STEM — for middle and high school students.

"Students have become more knowledgeable about STEM topics, more confident when participating in STEM activities and more interested in STEM careers," Padolf said. "They are also learning about the dietary importance of fresh vegetables for maintaining health."

Now in its sixth year, the program initially involved schools in Florida but expanded nationwide. Padolf said 250 schools in 32 states have made contributions toward helping NASA identify plants and crops that can be grown in space. Santa Fe Public Schools announced in January that Aspen joined the program.

The school begins its project Tuesday, Daboub said, and it is split into two 28-day growth cycles. In the first cycle, students will monitor the effects of fertilizer on the growth rates of mizuna, a leafy green commonly grown in Japan during winter.

Students will choose what to grow for the second cycle, though Daboub said the item has not been selected. His four middle school science classes will collaborate on the project, but the eighth graders will take the lead. He said about 90 students could be involved, although that number will likely shrink as the project moves forward.

"It's not an easy project," Daboub said. "There are spreadsheets, some things you have to keep up with. By the end of it, I might have 25 kids or so that are still actively engaged, but everybody has a part in it now — that's if they want to."

Santa Fe's 7,000-foot altitude may provide some unique findings for NASA, Daboub said, and that was a contributing factor in the school's selection. He said Mizuna was picked by NASA for its ability to withstand cold temperatures and regrow, as well as the amount of nutrients it releases into the soil.

Aspen Principal Tina Morris said Daboub's actions may help students develop a deeper learning about science by doing it in a creative way that goes beyond the classroom.

"It just opens a whole world of ponderings and musing for these kids," Morris said.

The students' classroom for the project will be Aspen's greenhouse, but the immediate problem is the remote-learning model due to the coronavirus pandemic. Daboub said the initial plan is for him to handle the fertilization and watering, and he will use cameras that students can view to chart the mizuna's growth.

The students will relay their information to NASA via social media; Daboub said they will have to create a Twitter profile to do that.

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“All of the schools around the country are running the same experiment,” Daboub said. “So, they can see our data in real time, and we can see theirs, which is pretty cool.”

Morris said there is a possibility students can monitor the project in person once the district moves to hybrid learning Monday. Under the model, students will have two days of in-person instruction to go with three days of weekly virtual learning.

The school has allowed small groups into the greenhouse for its garden growers club, Morris said, but no more than three students at a time.

“That greenhouse is a large structure, and we want to bring kids back,” Morris said. “We will follow all the [state] Department of Health guidelines, as far as wearing masks and social distancing. So, we can’t have a large number in there at a time.”

Morris said Aspen will remain in the program next year to ensure students can get the full, in-person experience this year’s group will miss. Padolf said schools can participate as long as they want, and Fairchild provides new experiments that build on the results of the previous year.

Daboub said that will make for an interesting experiment itself, because he has noted some students have performed better overall online than they did in the classroom and vice versa.

What matters to Daboub, though, is keeping his students engaged and learning during one of the more difficult times they have encountered. He said he has poured his heart into his profession this year more than ever.

“I would say I’m on my fourth or fifth wind,” Daboub said. “I’m trying everything I possibly can.”