Space Camp: From the Makerspace to the Edge of Space

Teen engineers send their high-altitude balloons 22 miles above earth's surface

"I'm going to space!" exclaimed Grissy Trejo, as she watched her mentors fill the huge high-altitude balloon that would soon be soaring 103,400 feet above the ground - three times higher than airplanes.

Trejo may not have been going up with the balloon herself, but the light reflector the high school sophomore built certainly was -- and she couldn't be prouder.

Trejo was one of 11 teen engineers that participated in Space Camp, a weeklong camp in June hosted by BLDG 61 (the makerspace) at the Boulder Public Library. The group included a mix of middle and high school students in Science, Technology, Engineering and Math (STEM) fields, including many from TRIO Programs (first-in-family college-bound) and the I Have a Dream Foundation.

Students spent the week designing, coding, laser-cutting and preparing for liftoff. The camp concluded with the launch of three high-altitude balloons during Space Camp and one balloon and the public launch on July 6.

"Space Camp was an absolutely amazing week, possibly resulting in the most engaged and activated group of environmentally-minded teens I have ever worked with," said Janet Hollingsworth, a BLDG 61 staff member who helped facilitate the camp and mentor the students.

Environmental sensors and tracking devices designed and built by the students were used in the public launch. Attendees were able to watch the live-streamed GoPro footage of the launch in real time as well as the footage from the students' launch at Space Camp.

"We built our own capsules and light reflectors and did the whole launch," Trejo said. "Now I'm back because I want to watch it again. It's a great experience."

The high-altitude balloon carried a sensor package that logged GPS location, altitude, humidity and temperature as the balloon rose 22 miles above the earth's surface. The data collected will go to studying emergent trends in the environment to better understand the world around us.

"It was a true citizen science project in every sense, exposing students who might not typically associate themselves with an aspirational project like this to doing real-world, meaningful work," Hollingsworth said. "Real-

world engineering and environmental design are for everyone to experience."

Space Camp was Trejo's first experience with the Boulder Public Library's makerspace, a community that provides maker education and technology to the public.

"Some people don't have the opportunity to go (to college), so doing this here is great," Trejo said.

Makerspace staff members, including Hollingsworth, hold free workshops, classes and trainings throughout the week for people of all ages.

"I would like to keep exploring this career path because these have been great mentors," Trejo said. "There's not many females in STEM, but I met Janet and she's such an inspiration."

Trejo's Space Camp experience encouraged her to further explore STEM fields -- and she isn't waiting. She is participating in another one-week camp this summer.

"'l'll be at CU (Boulder) for a cyber-encrypting class," Trejo said, "because this is just so fun!"

Visit bldg61.org to learn more about Space Camp and the makerspace.