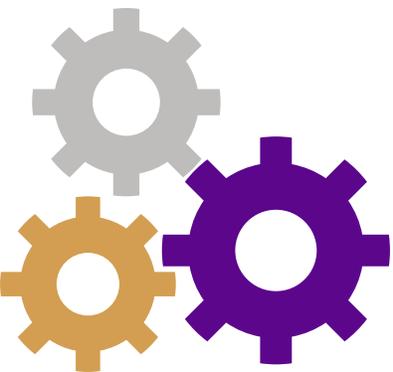


# Annual Report 2020-2021

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## Executive Summary

The ongoing COVID-19 pandemic caused many challenges for STEM Santa Fe from July 2020-June 2021, as it did for everyone else. Despite the difficulties of the new world of online learning, STEM Santa Fe continued to mentor and inspire students with virtual programs throughout the summer and the school year. We even handed out 300 customized “I love STEM” masks!

We were so lucky to have a community of practice who stepped up to provide quality virtual hands-on STEM programming to students who were powering through almost a full school year of online learning. Thanks to our instructors, volunteers and collaborators, we were able to continue to support students with project-based, hands-on virtual learning. Engaging students with this kind of learning became more important than ever in order to keep them excited about their education as many became burnt out on screens and disengaged. Students in the underrepresented groups in STEM that we especially wish to serve were some of those most adversely affected by the harm caused by the pandemic. We persevered with virtual programming, all hands-on with materials given out prior to each program. We even provided technology assistance and loaned laptops out in order for our participants to get the best experience no matter what their socioeconomic status is. With the pandemic highlighting so many educational inequities, we continued to strive towards our goals of increasing diversity, equity and inclusion in STEM education.

### Our Diversity, Equity and Inclusion Statement:

As STEM advocates strive to understand and creatively solve current and future problems in our world, it is crucial that the voices of all people are represented in all the fields STEM encompasses. Race, ethnicity, culture, nation of origin, languages spoken, gender identity and expression, color, religion, disability, and sexual orientation are all vital aspects of peoples’ voices. We strive to make STEM Santa Fe a safe and welcoming space for students from under-represented communities in STEM. Our focus on equity-based practices throughout our programming helps us recruit, engage, and support any and all students who benefit from hands-on, relevant STEM education. By leveraging our community of practice to create a more diverse, equitable, and inclusive environment for STEM education, we hope to create a foundation for a world filled with analytical citizens exploring complex issues for the betterment of society.

During the year 2020-2021, STEM Santa Fe:

- **Served 586 students from 5<sup>th</sup>-12<sup>th</sup> grade**, for a total of 4481 contact hours of direct services, with 66% of students served being female.
- Engaged 162 8th grade students from Carlos F. Vigil Middle School in Española in fun and thought-provoking math activities through a Julia Robinson Math Festival.
- Mentored 172 7<sup>th</sup>-12<sup>th</sup> grade students at Capitol High School, Española Valley High School, and Milagro Middle School through our STEM Scaffold Santa Fe in-school program.
- Provided 88 students with virtual STEM camps to keep them engaged in learning over spring and summer breaks.
- Continued to advocate for STEM education through virtual events and in-person appearances at the Southside library.



## STEM Pathways for Girls

### Virtual Conference

We held our annual conference in a virtual format in 2020 due to the COVID-19 pandemic. 98 girls in 5<sup>th</sup>-8<sup>th</sup> grade from 7 counties across Northern New Mexico participated. We distributed customized kits with workshop materials to the girls so that they were able to have a hands-on learning experience despite the virtual nature of the conference. 12 women in STEM careers led online workshops with the kits provided beforehand.

*"I love STEM. Thank you for providing opportunity for girls to explore STEM Pathways."*

- Student



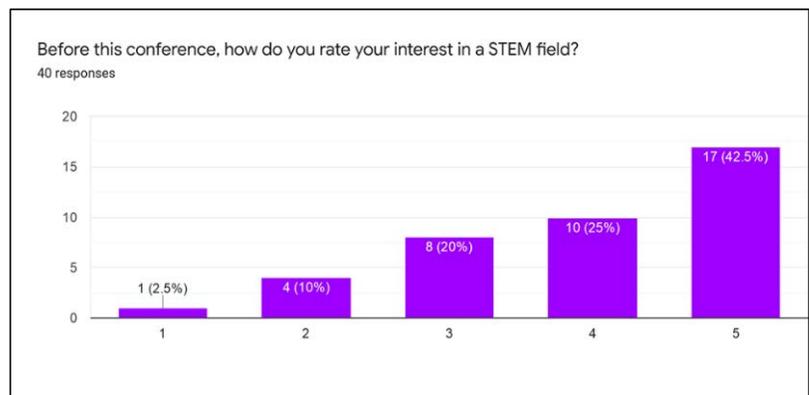
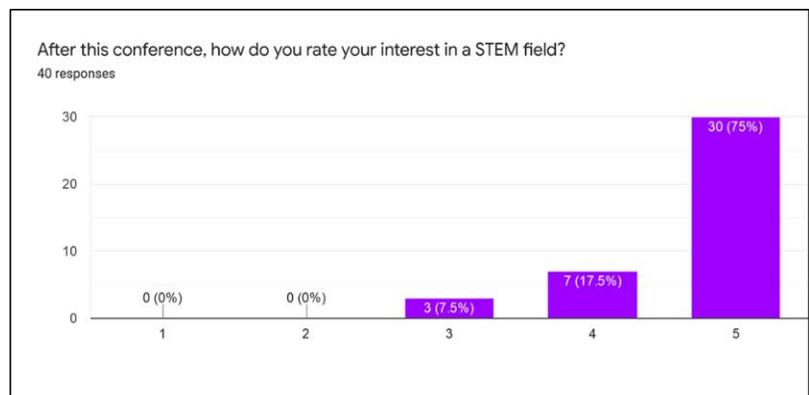
Going online for the conference was in some ways a blessing in disguise because it allowed us to recruit speakers and workshop presenters from all over the country and even Canada! The students who attended were also more spread out across the counties of Northern New Mexico than ever before.

To follow up the conference, five monthly workshops were offered for girls only again virtually January - May 2021.



*"It was amazing to see so many great ideas and scientific observations. Learning about science was a fun learning experience."*

- Student



# Julia Robinson Mathematics Festival

A Julia Robinson Mathematics Festival (JRMF) is intended to hook students of all ability levels on math by offering them fun and thought-provoking math activities in a social and cooperative environment. Students explore games and puzzles together in groups, and are motivated by the social atmosphere rather than a grade or a prize.

In May 2021, STEM Santa Fe held a virtual Julia Robinson Mathematics Festival exclusively for 8th grade students at Carlos F. Vigil Middle School in Española. The event was organized by Lina Germann of STEM Santa Fe, Simón Miera, GEAR UP District Director Española Public Schools, and Janelle Vigil-Maestas, LANL Community Partnerships Office. 162 students participated in the 2-hour event, each choosing two of the ten possible activities.

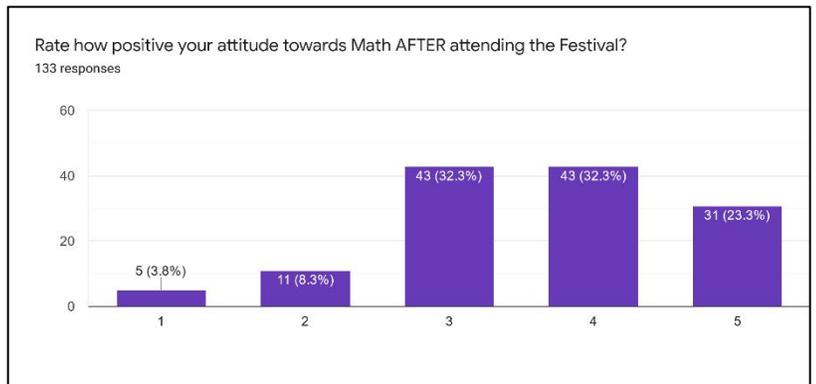
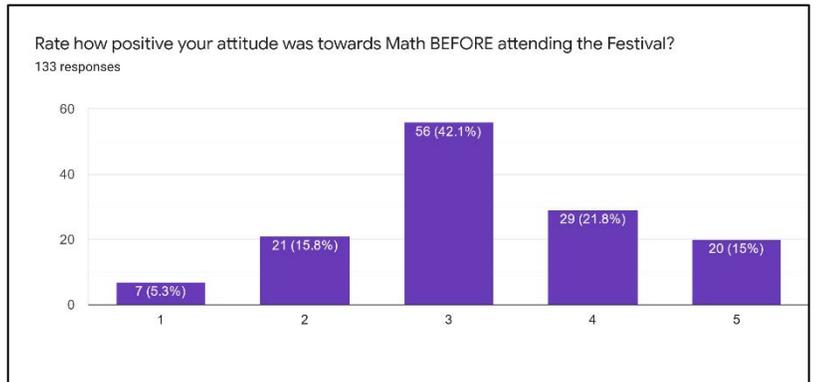
*"This was a very well organized activity, I thought it went really well! Like I said, not all kids actively participated, but I think that it might be unrealistic to expect all of them to be active. The kids that were active were very engaged and curious, it was awesome!"*

- JRMF Facilitator

20 facilitators guided students through online activities over Zoom. Every activity had an online app to help students engage and problem solve.

Activities:

- Juice Jumble
- Chocolate Fix
- Colored Loops
- Königsberg
- Chameleon Island
- Gerrymandering
- Squareland
- Ladybugs
- Penguin Island
- Trail Mix



*"I liked the way they explained step by step, then let us try it by ourself."*

- Student

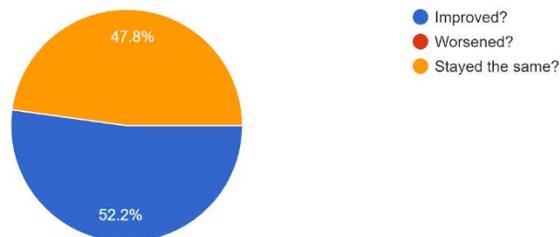
## STEM Scaffold Santa Fe

STEM Santa Fe adapted to the needs of our community this school year by continuing to serve Capitol High School and adding 4 new schools to our program: Española Valley High School (EVHS), Milagro Middle School (MMS), El Camino Real Academy (ECRA), and Desert Sage Academy (DSA). We offered a series of virtual Career Fairs to AVID juniors and seniors at Capitol High School. EVHS and MMS received kits and support from our college student mentors to guide students through an 8-week building/Arduino-based coding project: Smart on-lane bridge. We provided kits to ECRA and DSA as well and Professor Steve Cox of Northern New Mexico College provided training to teachers to help students complete the projects.

In addition, our mentors worked on expanding the projects' curriculum to include not only the Laser Harps, Solar Sun-trackers and Smart Greenhouses from previous years, but also an Arduino-controlled Smart One-Lane Bridge and Arduino-controlled Hand-Heart Drum. Instructional videos were constructed for the Smart One-Lane Bridge project and a prototype for the Hand-Heart Drum was created.

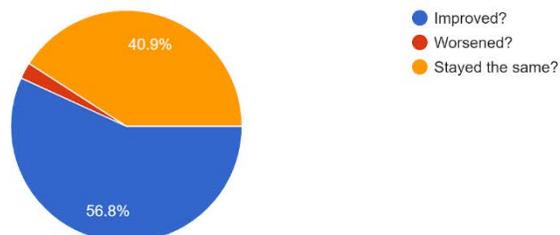
This program impacted a total of 172 students from 7<sup>th</sup>-12<sup>th</sup> grade and 10 teachers across 2 school districts, providing 1-1.5 hours of weekly mentoring for 8 weeks for a total of 1,726 contact hours.

Compared to the start of this project and now, has your opinion of STEM:  
23 responses



### SURVEY RESULTS FROM ECRA

Compared to the start of this mentorship program, has your opinion of STEM:  
44 responses



### SURVEY RESULTS FROM EVHS

*"I think it's important because it's very different from online or learning from videos because you do more critical thinking. You really work on your team collaboration skills because you can decide who's going to do what and do your part and focus on what you're doing."*

- Espanola Valley High School Student

*"I am scared about going into college but then seeing the panelists and seeing how they have a career that they enjoy motivated me into facing up the challenges that I will face in the future."*

- Capitol High Senior

*"The panels allowed me to realize that I can do a lot more than I was told I could."*

- Capitol High Junior

## Virtual STEM Camps

We offered 5 virtual summer camps for students from 5<sup>th</sup>-12<sup>th</sup> grade in the summer of 2020, all project-based and hands-on. We distributed project kits to all participants and facilitated the camps over Zoom. 66 students from 5 counties participated, for a total of 1,646 contact hours across all 5 camps.



*"...in these times of being at home, your attention and quality courses have been a joy for my daughter since she was restless, bored. I congratulate and thank you very much for your activities."*

- Parent

### 3D Design

A two-week camp introducing students to 3D design and printing. Students made personalized designs in Tinkercad with the help of live instructors. Designs were then printed out for them and made available to be picked up in person.

### Engineering

A two-week camp where students were challenged to build a tabletop Solar Sun Tracker controlled by an Arduino microcontroller. This device had sensors to track the sun and move its solar panel in two dimensions in order to produce power more efficiently.

### App Development

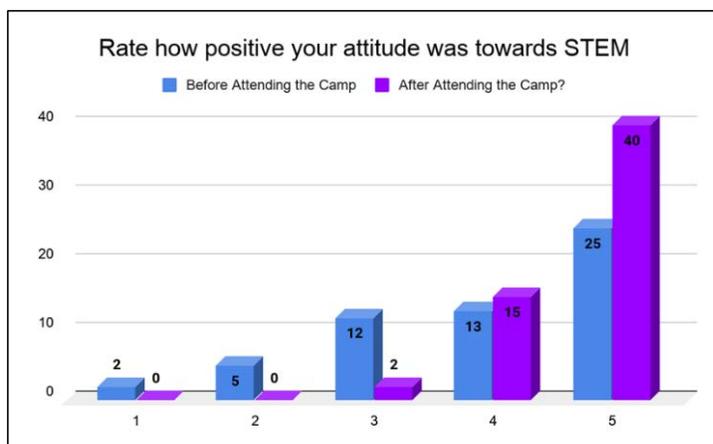
This two-week camp was designed to engage students in computer science by building an app around a topic they cared about and to walk them through submitting their apps to the Congressional App Challenge.

### Virtual Puzzle Solvers

This one-week camp was filled with thought-provoking games and puzzles with mathematical themes derived from our partner, the Julia Robinson Mathematics Festival organization.

### DNA Detectives

This two-week camp educated students on the real-world uses of biology and genetics. Students worked through projects on case studies in the fields of epidemiology, dendrology, and zoology.



### Making Friends with the M in STEM

We also offered a Spring Camp to 22 students for the first time in March of 2021. This one-week virtual camp was a collaboration with MathHappens Foundation. Students explored math topics with different instructors each day Monday-Thursday and then they enjoyed a musical performance by Matheatre on Friday.

## Outreach and Advocacy

Although the COVID-19 pandemic made public appearances and outreach difficult this year, STEM Santa Fe was involved in several virtual outreach events and even some in person when it became safe to do so!

*July 11, 2020: **Los Alamos ScienceFest 20/20: Eyes on the Future** - Students and instructors presented a sample of what they are learning virtually at our summer camps*

*November 22, 2020: **Fall into Place 2020 Conference** - New Mexico Out-of-School Time Network Virtual conference. Presentation by Dr. Lina Germann titled: Virtual Puzzle Solvers.*

*February 6, 2021, **5th Anniversary Celebration 2021** - Eat, Play Learn featuring Chef Fernando Ruiz, Cookbook Author Cheryl Jamison, Chef Andy Barnes*

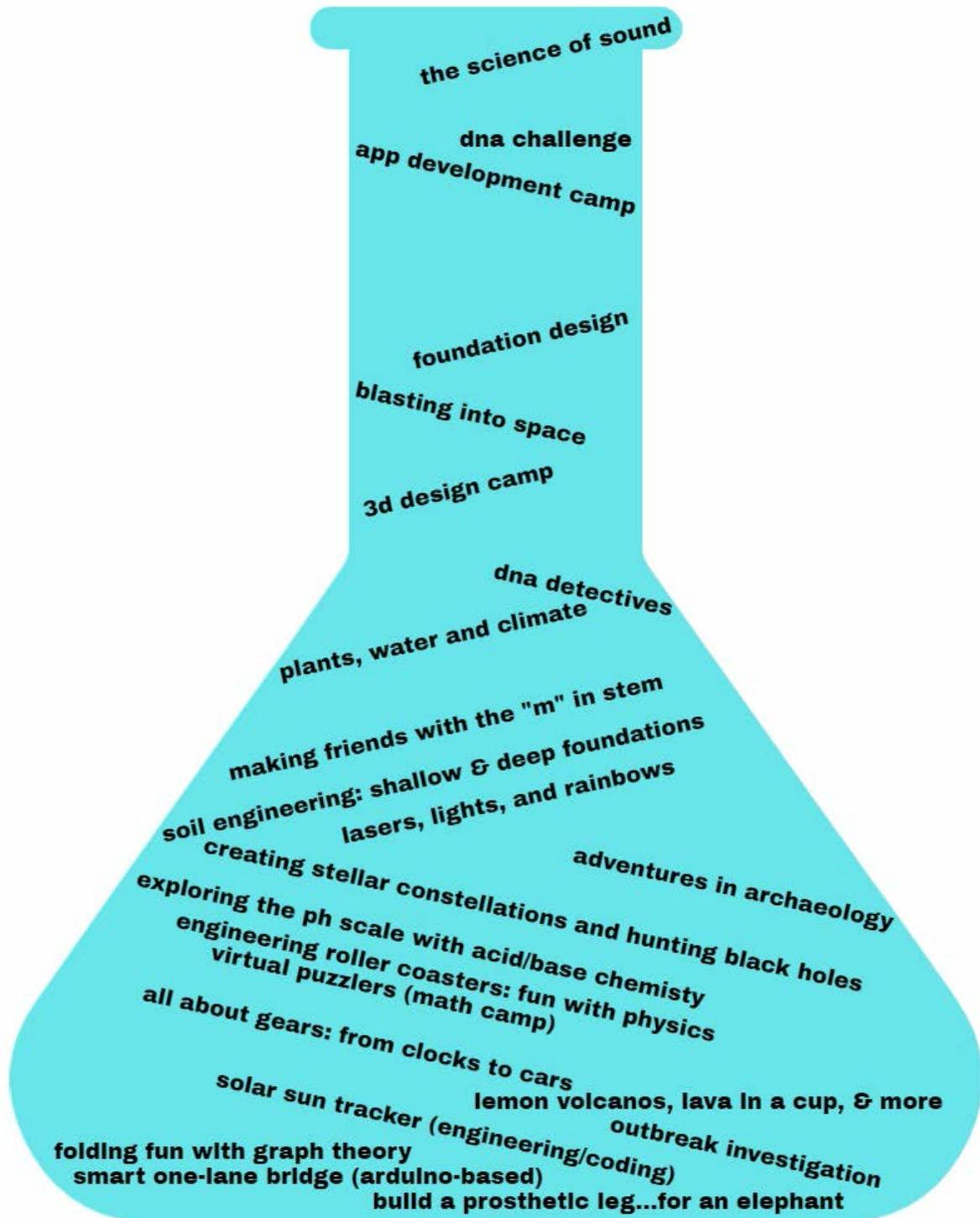
*February 20, 2021, **Discover STEAM Virtual Event** - Exhibitor on Youtube Live*

*March 11, 2021, **SFPS STEAM Innovation Expo** - Watch students discuss our STEM Scaffold Santa Fe program provided for them in their classes*

*June 12-July 31, 2021: **STEM Saturdays at Southside Library** - STEM Santa Fe collaborated with the Santa Fe Public Library to offer summer STEM programming to rising middle school and early high school students on a walk-in basis.*



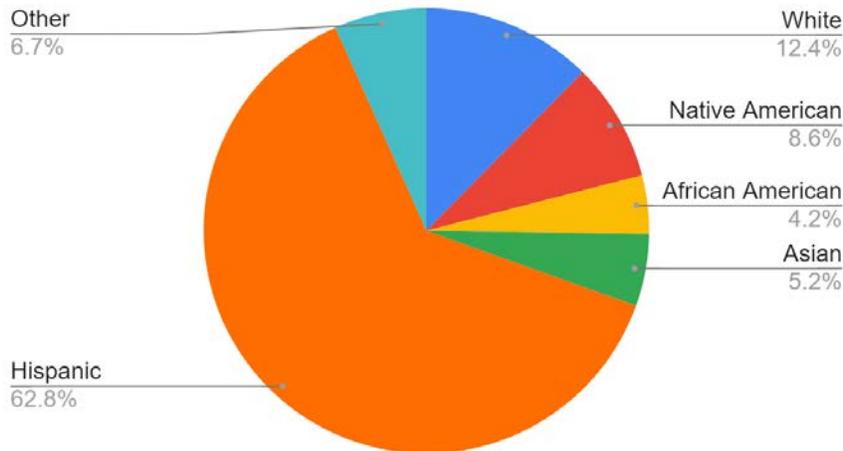
## STEM Topics Covered in 2020-2021



## By the Numbers

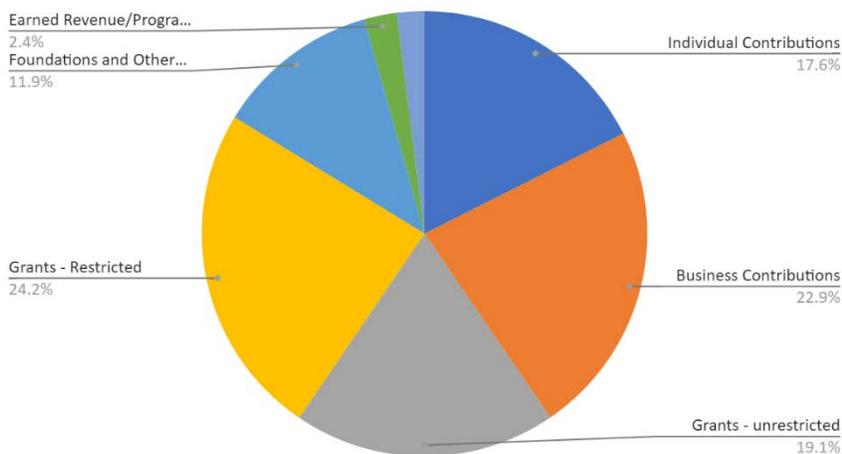
Across all our programs in 2020-2021, STEM Santa Fe served a total of 586 students from 5<sup>th</sup>-12<sup>th</sup> grade, for a total of 4481 contact hours. 66% of students served were female, 33% male, and 1% nonbinary/genderfluid.

STEM Santa Fe Student Demographics 2020-2021



Our programs were made possible by the time and resources of our community. We worked with 139 volunteers and 33 collaborators this year, for almost 300 volunteer hours. 17.6% of our funding came from individual contributions. We received \$3,485 worth of donations of in-kind goods. In addition, we are grateful to our partner Santa Fe Community College for hosting us.

Sources of Funding

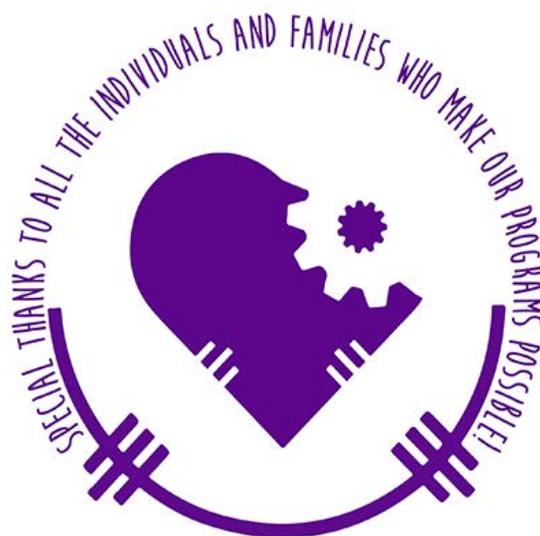


## Thank you to our Sponsors and Community Partners!

We are so grateful to all our sponsors, donors and community partners; each and every one of them is vital make our programs happen!

### **2020-2021 STEM Santa Fe Sponsors**

Anchorum St. Vincent  
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 Santa Fe Community Foundation, Rabinowe Family Fund



### **Community Partners**

Santa Fe Community College  
 Northern New Mexico College  
 LANL Community Partnerships Office  
 Santa Fe Public Schools  
 Santa Fe Public Library  
 Española Valley Public Schools  
 New Mexico Institute of Mining and Technology