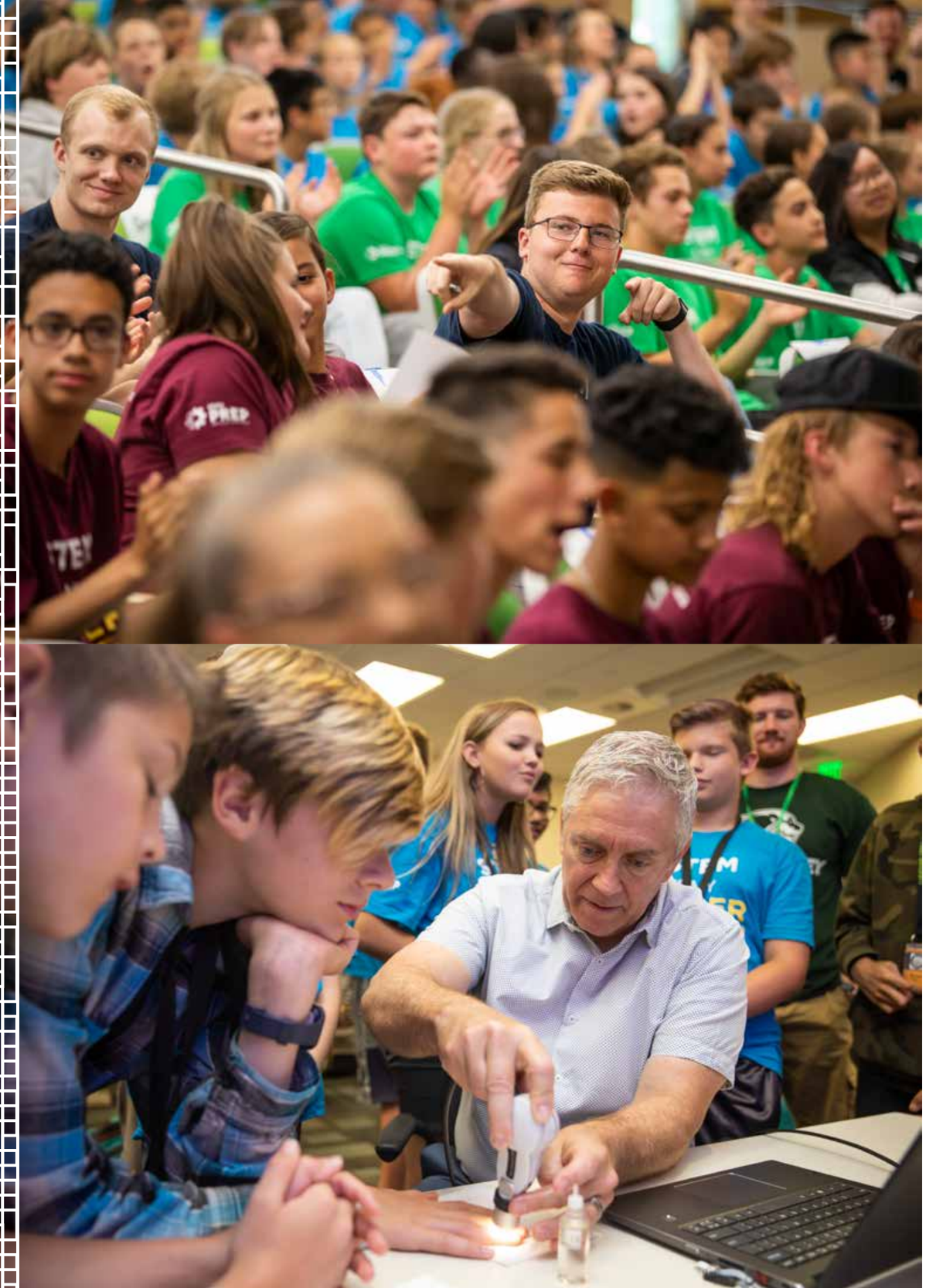
UVU

PreFreshman Engineering Program (PREP)

Case for Support

uvu.edu/evergreen



Given the pivotal role that science, technology, engineering, and math (STEM) play in our modern workforce and daily lives, it is critical that STEM careers and college degree programs draw the interest of talented students from diverse backgrounds. Middle school is a vital time to capture students' interest, lay an essential foundation in mathematics, and help students form a STEM identity.

Utah Valley University's PreFreshman Engineering Program (UVU PREP) engages middle school students in fun yet challenging STEM education. For six weeks every summer, students participate in authentic, hands-on experiences with highly qualified teachers in the fields of physics, engineering, math, technology, and more. Participants also learn about a breadth of STEM careers and opportunities through guest speakers and field trips. They see the practical application of mathematics and scientific principles through engaging projects and contemporary technology. Students also get excited about math because they see how it works as a foundational building block. This program helps students envision themselves in STEM college programs and careers.

UVU PREP is free to middle schoolers with an interest and aptitude in STEM, making this pivotal program accessible to students from all backgrounds. I invite you to read more about UVU PREP and envision yourself as a STEM supporter. Help us make a strong STEM future a reality.

Sincerely,

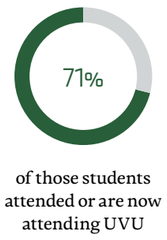
Liz Andrus M.Ed.
Director, School Community University Partnership

PREFRESHMAN ENGINEERING PROGRAM

At-a-glance

482

former UVU PREP students from 2013 to 2021 are attending college



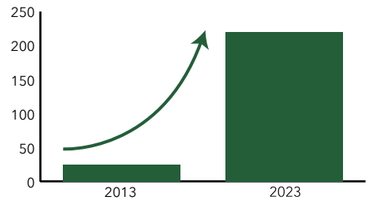
of those students attended or are now attending UVU

STEM jobs grew more than

2X

the rate of non-STEM jobs between 2009 and 2015

In 2013, UVU PREP welcomed 25 students. The projected class for 2023 is 220 students.



UVU PREP provides three years of free STEM education:

Year One

- Logic and Its Application to Mathematics
- Introduction to Engineering
- Problem Solving I

Year Two

- Algebraic Structures
- Introduction to Physics
- Problem Solving II

Year Three

- Math Innovations
- Introduction to Probability and Statistics
- Computer Science

Source: *UVU PREP, U.S. Bureau of Labor Statistics*

Science, technology, engineering, and mathematics (STEM) in early education play a key role in young students' development. STEM education fosters critical thinking, increases scientific literacy, fuels curiosity, and produces the next generation of innovators.

STEM occupations are growing, and STEM workers have higher median salaries than their non-STEM counterparts. Even as the STEM workforce grows, critical educational challenges need to be addressed. Average mathematics and science scores among U.S. students lag behind those of other developed countries, and the lack of diversity in STEM professions is a national concern. In Utah, the need for STEM workers outpaces the number of qualified employees who can fill positions.

At Utah Valley University, UVU PREP provides solutions by reaching students at a pivotal age and supplementing their STEM education. UVU PREP is a STEM summer program for middle school and junior high students from the Alpine, Nebo, and Provo school districts. The program provides three consecutive summers of rigorous academic instruction, hands-on educational projects, challenging homework assignments, and insightful field trips. The program, including lunch and learning materials, is completely free for admitted students.

Each summer, incoming seventh, eighth, and ninth-grade students interested in STEM are immersed in six weeks of accelerated curriculum on UVU's Orem Campus. These students apply in sixth grade and are selected based on academic performance, teacher recommendation, and a short personal essay. Those accepted are high achievers who are interested in pursuing STEM careers.

By reaching students early, UVU PREP nurtures students' interests and builds their confidence — and this early intervention is imperative for students traditionally underrepresented in STEM classrooms and professions. UVU PREP not only generates future employees to fill Utah's growing needs but also supports diversity in STEM education and professions.

1 *ncses.nsf.gov/pubs/nsb20212/figure/LBR-12*

2 *pewresearch.org/fact-tank/2017/02/15/u-s-students-internationally-math-science*

UVU PREP Goals

1. Inspire underrepresented middle school students to pursue STEM careers
2. Immerse middle school students in accelerated STEM curricula

How you can

MAKE AN IMPACT

Goal 1: Inspire underrepresented middle school students to pursue STEM careers

Many students enrolled in UVU PREP come from populations that are underrepresented in STEM. These students may not feel like they have a place in higher education. UVU PREP shows participants that they belong and that their contributions are valued.

Women and people of color are underrepresented in STEM jobs relative to their presence in the U.S. workforce. The prevalence of stereotypical bias deters women from pursuing education and careers in STEM. A 2017 National Assessment of Educational Progress survey found that young girls become interested in STEM subjects at age 11 but lose interest by age 15.

A 2017 Pew Research Center study found that people of color are underrepresented in STEM work primarily because of a lack of educational opportunities. This research also found that students of color were less likely to receive encouragement at an early age to pursue STEM-related subjects.

UVU PREP reaches children of diverse backgrounds when they are most open to exploring STEM disciplines. The program provides advanced lessons, experiential learning opportunities, and exposure to diverse instructors and role models. At no cost to the students, UVU PREP strengthens STEM education and reinforces participating students' self-assurance. The program unites unique, talented students from three school districts and allows students who share a love for STEM to make lasting friendships.

Early data shows incredible success among UVU PREP's first cohorts. A large percentage of students who have completed UVU PREP are currently earning college degrees, many at UVU. UVU PREP's positive impact on middle school students is immeasurable — not only in education but also in building self-confidence, determination, and lasting relationships. Essential resources are needed to continue providing this unique educational opportunity to Utah students. Additional funding to increase UVU PREP's reach, hire qualified staff, and purchase up-to-date technology will enhance students' experience in the program. *(continued on next page)*

1 *bit.ly/41AukEZ*
2 *bit.ly/40B6Kqu*

Student Testimonials

Jaxon Crow

What I learned about myself this year is that I can do hard things. I can basically do ANYTHING if I have a growth mindset.

Jon Ramirez

This program challenged me to the point that my head hurt, and I felt like quitting this program. I didn't quit and once I solved it, I felt accomplished and great inside. Now I feel like I can.

Tayla Meyer

I like to struggle because it makes me want to work even harder and pushes me to make my brain even bigger.

Goal 1 (Continued)

Targeted Recruitment

Targeted recruitment is key to UVU PREP's continued success. In the seven years since UVU PREP's inception, demand for the program has grown tremendously. In 2013, UVU PREP accepted 25 students. In 2022, a total of 220 students participated. The uptick in interest is due to the staff's continuing outreach efforts to local sixth-grade classes and the program's growing reputation and visibility.

Each year, program staff make a concentrated effort to share information about UVU PREP with sixth-grade students from diverse backgrounds, particularly in Title 1 schools. These classroom presentations require time and personnel. Further efforts include professional marketing materials that showcase what UVU PREP offers. With additional funding, staff can expand their current outreach and provide this opportunity to more students.

Summer Associates:

UVU PREP depends on one of its most crucial resources: adequate staff. The program has partnered with Boys & Girls Clubs of America and AmeriCorps to hire outstanding summer associates who act as student mentors and UVU PREP instructor teaching assistants.

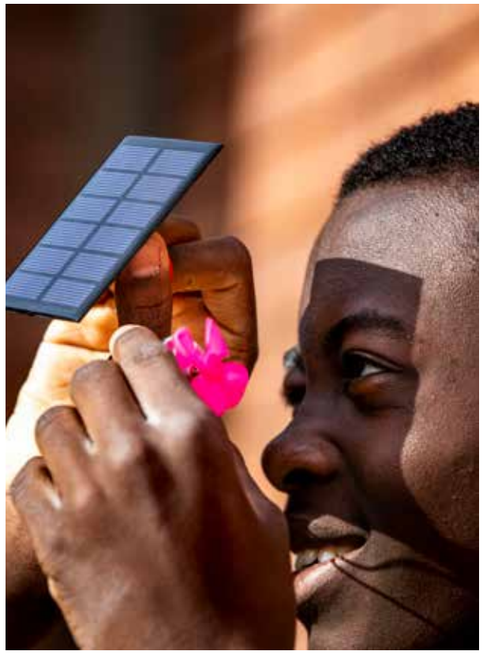
AmeriCorps grants funds for 31 summer associates who work 300-450 hours over the six-week program. Many associates feel passionate about introducing younger students to the world of STEM, while others are natural instructors. These associates are undergraduates from UVU and other local universities, and most are majoring in STEM-related fields or education. Summer associates often learn concepts alongside middle schoolers and exchange ideas, talk through problems, and tap into younger students' knowledge.

Experiential Learning

UVU PREP teaches student-centered and experiential skills, as STEM education requires experiential learning. Chromebooks are used for physics and engineering classes. By their third year, students are fully immersed in computer science work, which requires laptops with more advanced capabilities.

Right now, UVU PREP is working with an insufficient number of laptops, making it difficult for students to use the technology needed for the program's activities. Funding for additional technology will help students prepare for their journeys in higher STEM education.

Investment:
$125,000



PREP for the Future

Along with valuable instruction for learners, UVU PREP provides hands-on learning opportunities for UVU students who are hired as summer associates to help run the program.

Kason Binford came to UVU as a first-generation student, but he wasn't sure what to study.

"I always loved working with kids, even when I was in high school," he said. "That sparked a desire to work in teaching."

Kason first began working with UVU PREP as an undergraduate, and his experience in the program encouraged him as he pursued a degree in math education. He worked as a summer associate for the program for four years.

"UVU PREP helped me develop a teaching philosophy because I saw real teachers in the classroom," Kason said. "I was getting to see professionals do classroom management, teach curriculum, engage students, all those things. And I got to take on my own responsibilities."

As Kason approached graduation, he knew he wanted to become a UVU PREP teacher.

"It just so happened that a teaching position opened up the same year I got my degree," he said. "So I interviewed, and I got the job."

Along with a full-time teaching position as a math educator at the Utah County Academy of Sciences (UCAS), Kason has worked as a UVU PREP teacher for the past three summers. He looks forward to continuing to educate future generations of STEM students.

Kason Binford '18, Math Education

Goal 2: Immerse middle school students in accelerated STEM curricula

UVU PREP's advanced curricula provide unique opportunities not found in typical classrooms. One of the program's most important missions is to provide the best education possible every summer. To achieve its mission, the program needs assistance in several areas:

Tech T's

During Tech T's lessons, UVU PREP students are exposed to the latest innovations, including robot interactivity, 3D modeling, virtual reality goggles, and more. These hands-on experiences bring STEM concepts to life.

UVU professors continually develop dynamic curricula for Tech T's, including 18 lesson plans emphasizing experiential learning. Involving these faculty members enriches UVU PREP students' STEM experience, but significant funds are needed to sustain faculty mentorship. Increased funding will give UVU PREP students the best possible experiences with new technologies and UVU faculty members.

Updated Curricula

Technology evolves rapidly, and UVU PREP's instructional materials must be regularly updated to reflect this. UVU PREP employs a specialist who facilitates the necessary materials and curricula updates for the nine on-site courses and satellite locations inspired by the program. Through dynamic and agile programming, UVU PREP has built a reputation as a leader in STEM education. Funding helps the program employ a UVU PREP curriculum specialist who optimizes and designs learning experiences for participants.

Investment:
$57,000

Excursions

Field trips complement students' rigorous classroom work and provide space for meaningful, formative experiences. Past cohorts have enjoyed engaged-learning trips to planetariums, museums, and aquariums and have toured workplaces of STEM industry leaders. This exposure is crucial in showing students potential STEM career paths.

Funding is needed to create these experiences for over 200 students and staff. Busing and entrance fees to field trip destinations are costly, but students can continue participating in invaluable learning opportunities with additional financial support.

Incentives and Closing Celebration

UVU PREP students spend three consecutive summer vacations attending difficult classes. Attendance is mandatory, and coursework is challenging. These are huge sacrifices for incoming seventh, eighth, and ninth graders; however, most participating students find that, though the work is intensive, it is worth the effort. Students who complete all three years celebrate with a day of rock climbing, laser tag, and bowling.

At the Closing Celebration, UVU PREP staff and teachers hand out small gifts, such as UVU swag, to inspire these students in their future endeavors.

Additional funding can alleviate these annual costs.

Student Testimonials

Alina Simpson

I learned that I am capable of so many things and that if I want to accomplish something I have to work hard at it.

Dallin Bertasso

I learned that I can do hard things. Also, if I struggle, I'll still learn. This program was challenging, but I learned how to work through it.

David Lopez

If I work hard enough I can accomplish many things.

Mary Turgerelt

I learned that even though something is hard, it can be so much fun. I look forward to class every day. Now, I feel like challenges are much more fun than they were before I came to this class. And it gave me confidence in myself.

*Ever*GRATEFUL.

It is an exciting time to be engaged in STEM. Every day, new scientific and technological discoveries are made. Engineers, programmers, and scientists are in higher demand than ever before. With your support, UVU PREP can continue its mission and grow to create an even greater impact. Your gift will enrich the lives of students who will drive development and innovation in our community and around the world.

Thank you!

For more information, please contact:

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