

2021-2022 IMPACT REPORT



**SCIENCE & TECHNOLOGY  
EDUCATION PARTNERSHIP**

Inspiring students to pursue careers in  
**Science, Technology,  
Engineering and  
Mathematics**



# TABLE OF CONTENTS

|  | Page |
|--|------|
| Sponsors   | 4    |
| In-Kind Sponsors   | 5    |
| Overview   | 6    |
| History  | 7    |
| Our Target Community & Beyond                                | 8    |
| STEP Board Chairman Highlight/Executive Officers & Directors | 9    |
| Picture Our Programs!  | 10   |
| STEM Summer Learning Labs 2022                               | 11   |
| Educator STEPCon22   | 14   |
| Student STEPCon22  | 16   |
| Science Show Snapshot 2023                                   | 18   |
| Our Overall Impact   | 19   |
| Our Next Steps...  | 20   |
| Program Planning Team  | 21   |

# SPECIAL THANKS

It is with immense gratitude and our greatest appreciation that we acknowledge the sponsors and partners that make this work possible. Without their commitment to our community, STEP's ability to transform communities to create opportunities for all young people would not be possible.

We also thank our very generous in-kind sponsors who donate numerous volunteer hours as well as staff and resources. Without these partners, STEP would not be able to provide high quality, hands-on STEM learning experiences for K-12 students throughout the Inland Empire, as we strive to excite them about excellent career opportunities in our communities.

# SPECIAL THANKS

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**The Mission of STEP is to inspire K-12 Students to pursue STEM education and STEM careers. STEP follows the adage that the best way to experience career opportunities is to “walk a mile in the shoes of a person working in that career.” STEP achieves its Mission at two levels:**

The STEP Conference is focused on STEM and each October provides STEM experiences to K-12 students and educators who attend this annual conference. This includes a Science Show, STEM exhibit booths and presentations, and workshops. In 2023 we are also adding another component: a STEM focused conference dedicated to counselors to provide them current information on STEM opportunities to improve student’s future.

The STEM Summer Learning Labs are week-long STEM summer programs that provides extended learning experiences for ninth to twelfth grade students. The goal is for them

to learn about STEM careers in their community in the areas of policing, fire-fighting, public utilities, manufacturing, and developing solutions to community problems with 40 contact hours per participant per program. In 2023 we are adding another STEM summer learning lab dedicated to engaging kids with current technology needs such as artificial intelligence, machine learning and cyber security. In 2023 we are also adding two academies dedicated to elementary students and middle school students in order to encourage them to learn the skills they will need to be prepared for rigorous STEM subjects.

For 23 years, the STEP Conference has provided K-12 students with exciting opportunities to engage with STEM professionals and various careers available in the Riverside and San Bernardino Counties of Southern California. The STEP Student Conference has included a Science Show conducted by engineers from General Atomics located in San Diego. The Science Show demonstrates many fundamental scientific principles and engineering applications in a way that reaches audiences of all ages. In addition, students experience a variety of exhibit booths representing various STEM careers and industries including: the Navy, Engineering & Manufacturing, Environment, Education Opportunities, Medical Careers, and Technology. At these booths students interact with STEM professionals and learn how STEM skills are used in various careers in their communities.

Pre-COVID-19, the STEP Conference was held in person over a two day period for 5,000 students from throughout Riverside and San Bernardino Counties: however in 2020, we moved to an entirely online virtual experience. As a result, we saw our attendance numbers triple to almost 15,000 with global reach! Post-COVID-19, we have adopted hybrid programming to include more under-served students throughout the two counties.

In 2017, the STEM Summer Learning Labs were developed in partnership with the Riverside Police Department and Riverside Fire Department (STEM LEAPS). Since then, we have developed the following additional week-long programs: STEM in Public Utilities (STEM PULL), STEM in Advanced Manufacturing (STEM I AM), and STEM Solutions focused on sustainability and the environment. These programs provide eighth through twelfth grade students 40 hours of hands-on learning focused on STEM careers. During each week, teams of students use an engineering design process called “We Are All Designers” to develop and then present a STEM project based on the information they learned. Student teams are awarded cash scholarship prizes for each program’s top three teams. In 2017, the full-day Educator Conference was developed to provide outstanding professional development for educators working with students in STEM. This conference is intended to inspire educators and develop their knowledge of best practices while working with their students in the classroom. Keynote speakers from throughout the country, along with local educational professionals, provide inspiration and information. However, the highlight of the event are the student scholarship winners who share how they were inspired by educators to prepare for their career in STEM.



Due to the COVID 19 shutdown, our virtual programs reached students beyond the Inland Empire. We welcome students outside of our local area; however, our focal target community is the Inland Empire.

The Inland Empire (locally known as the I.E.) is a region in Southern California; an urban and metropolitan area centered around the cities of Riverside and San Bernardino. The Inland Empire is located east of Los Angeles County. The Inland Empire is sometimes considered coextensive with the federally-defined Riverside-San Bernardino-Ontario metropolitan area, which covers more than 27,000 square miles (70,000 km<sup>2</sup>) and is part of the Greater Los Angeles area.

Home to over 4 million people, the metropolitan area consists of Riverside County and San Bernardino County, is the 13th most populous metropolitan area in the United States, and the third largest in the State of California.

At the end of the 19th century, the region was a major center of agriculture, including citrus, dairy, and wine-making. Agriculture declined through the 20th century, and since the 1970s a rapidly growing population, fed by families migrating in search of affordable housing, has led to more residential, commercial, and industrial development.

There is a trend of lower educational attainment in the IE, which starts early. Only 37 percent of 3- and 4-year-olds in the region are enrolled in pre-school, with only one school in the region for every 343 children, as compared with 48

percent enrollment in San Diego County. Thirty-five percent of the IE's ninth graders do not graduate from high school, and only 37 percent of its college age residents enroll in a post-secondary education program of some sort. Only 24 percent of the IE's adult residents have attained a college degree or better. Twenty-five percent do not possess a high school diploma. According to past CSUSB President Al Karnig, "We have a very low college attendance rate that is scantily above half of what the average is in other states. We only have about 20 percent of college graduates in the Inland Empire while the average in other states is 38 percent." 21 inland area high schools rank in the top 100 in California for producing dropouts.

The Inland Empire area is one of the least educated areas of the state with the lowest average annual wages in the country. A 2006 study of salaries in 51 metropolitan areas of the country ranked the Inland Empire second to last, with an average annual wage of \$36,924. Nonetheless, inexpensive land prices and innovative institutional support networks have attracted some small businesses and technology start-ups into the area.

While urbanization continues to cut into agricultural lands, the Inland Empire still produces substantial crops. Although 10,000 acres (40 km<sup>2</sup>) of irrigated land was lost between 2002 and 2004, agriculture still brought in more than \$1.6 billion in revenues to the two-county region in 2006.

## STEP Board Chairman HIGHLIGHT



**GORDON BOURNS** CHAIRMAN & CEO, BOURNS, INC.  
Gordon serves as the Chairman and CEO of Bourns, Inc., a family-owned electronic components manufacturing company headquartered in Riverside which also promotes STEM education.

In 2022, Bourns celebrated the 75th anniversary of its founding by Gordon's parents, Marlan and Rosemary Bourns, in their Pasadena garage. In addition to serving as the President of the STEP Board, he serves on the UCR Foundation Board, the Cal Baptist University Board of Visitors and the Woodcrest Christian School System Board. Gordon and his wife, Jill have been married for 44 years and are blessed by their four children, three son-in-laws, a daughter-in-law and eight grandchildren.

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Below in order from left to right, top to bottom: STEM PULL, July 2022; Student STEPCon22, Cyber Escape Room, July 2022; Student STEPCon22, Science Show, October 2022; Student STEPCon22, Exhibitors, October 22.



STEM Solutions, UCR, July 2022

For the past eight years, STEP has conducted its STEM Summer Learning Labs for students from grades 9 to 12, but predominantly students in high-school. Based upon the Kaizen Week process (Kaizen means good change in Japanese) used at Bourns, Inc., an electronics company headquartered in Riverside, students participate in up to three one-week long programs starting on Monday, July 11 and lasting until Friday, July 29. Most of the participating students had participated in all three weeks of the 2022 STEM Summer Learning Labs, in which there were about the same number of girls as boys attending each week.

In the first couple of days of each week, students are split into teams of up to six and are invited to join professionals in their work environment to see how careers that aren't traditionally labeled as STEM careers can be a good or more interesting career path for them. During the week, each team is fighting for the chance to win a podium position in the end of the week project design challenge. Their challenge is to analyze all that is put in front of them by professionals during the week and create innovative and prolific solutions to ineffective procedures or unsolved problems plaguing said field. The aptly named "STEM Design Team Challenge" rewards those that place on the podium a share in a cash prize that is split among the team evenly. For first place the reward in total is \$1,000, the second place team is then awarded \$750 in total, and the third place team is granted \$500 for their efforts.



STEM PULL Student Award Ceremony, July 2022

## STEM PULL

The first week, July 11 to 15, STEM Public Utilities Learning Labs (STEM PULL) was conducted for 49 students by STEP in partnership with Riverside Public Utilities, and Elsinore Valley Municipal Water District. The week was focused on the careers of our public servants and the STEM tools they use to keep our water and power safe and secure. Activities included touring, the Riverside Energy Resources Center (Peaker Plant), water supplies and facilities of EVMWD. A highlight was learning how much security is needed for protection of our water facilities, and not just in manpower alone, but in the electronics used on site and that there is a growing need for cybersecurity in every field of work due to our society's reliance on technology.

STEM I AM, STEM Presentation, CBU, July 2022

## STEM I AM

The second week, July 18 to 22 was STEM In Advanced Manufacturing (STEM I AM) during which the 50 students learned core principles of effective manufacturing through hands-on experience. During in-person tours of manufacturing companies including Garner Holt Productions, Niagara Water, and Goodyear Rubber, they saw how those manufacturing principles were being applied. This year for STEM I AM, participating teams solely focused on business simulation instead of the Design Challenge as to build soft skills in management as well as market prediction which is an aspect of STEM-based jobs that students aren't exposed to until the start of their career. The teams have to make decisions over eight quarters of play including product pricing, how much to invest in engineering and quality improvement, whether to build more production capacity and hire additional salesmen and the amount of dividends to pay to their investors. On the final day, there was a lightning round where all the teams went through three fiscal years which was to test the teams and see how they could best utilize what they learned during the week and apply it to a tense and fast paced "market".



STEM LEAPS, Award Ceremony, CBU, July 22

## STEM LEAPS

The second week, July 18 to 22 was STEM Law Enforcement and Public Safety (STEM LEAPS) where 44 students are engrossed in the world of public safety. During this week, students got to get an intimate look at the specialized teams for both the police and fire departments and how those teams are best utilizing the technology and tools at their disposal to ensure the safest and most effective solutions to stressful situations. This group of students also were introduced to how public safety doesn't just end at our public defenders, to demonstrate this idea, CBU's College of Nursing opened their doors to show the students how the medical field accents the efforts of both the police and fire departments.

Inspiring students to pursue careers in Science, Technology, Engineering and Mathematics Science and Technology Education Partnership,(STEP) <https://www.stepconference.org/>

## STEM SOLUTIONS

The last week of the STEM Summer Learning Labs was July 25 to 29, which was STEM Solutions during which students focused on the prevention of pollution and sustainability for water and air. Lorelee Larios, from UCR's Botany and Plant Science department, opened the week with a keynote speech about the importance of sustainability of our water and air resources and how best to keep them from being polluted. The week would expose the 63 students to all of what California, mainly the Inland Empire, is doing to research pollution and protect our communities from its adverse effects. Students would be engrossed in this issue with their visit to the California Air Resources Board SoCal headquarters in Riverside, as well as having breakout rooms with organizations around Imperial Valley and the Salton Sea to discuss how they combat the poor air quality in their area.

STEM Solutions, Presentation with the Dean, UCR, July 2022



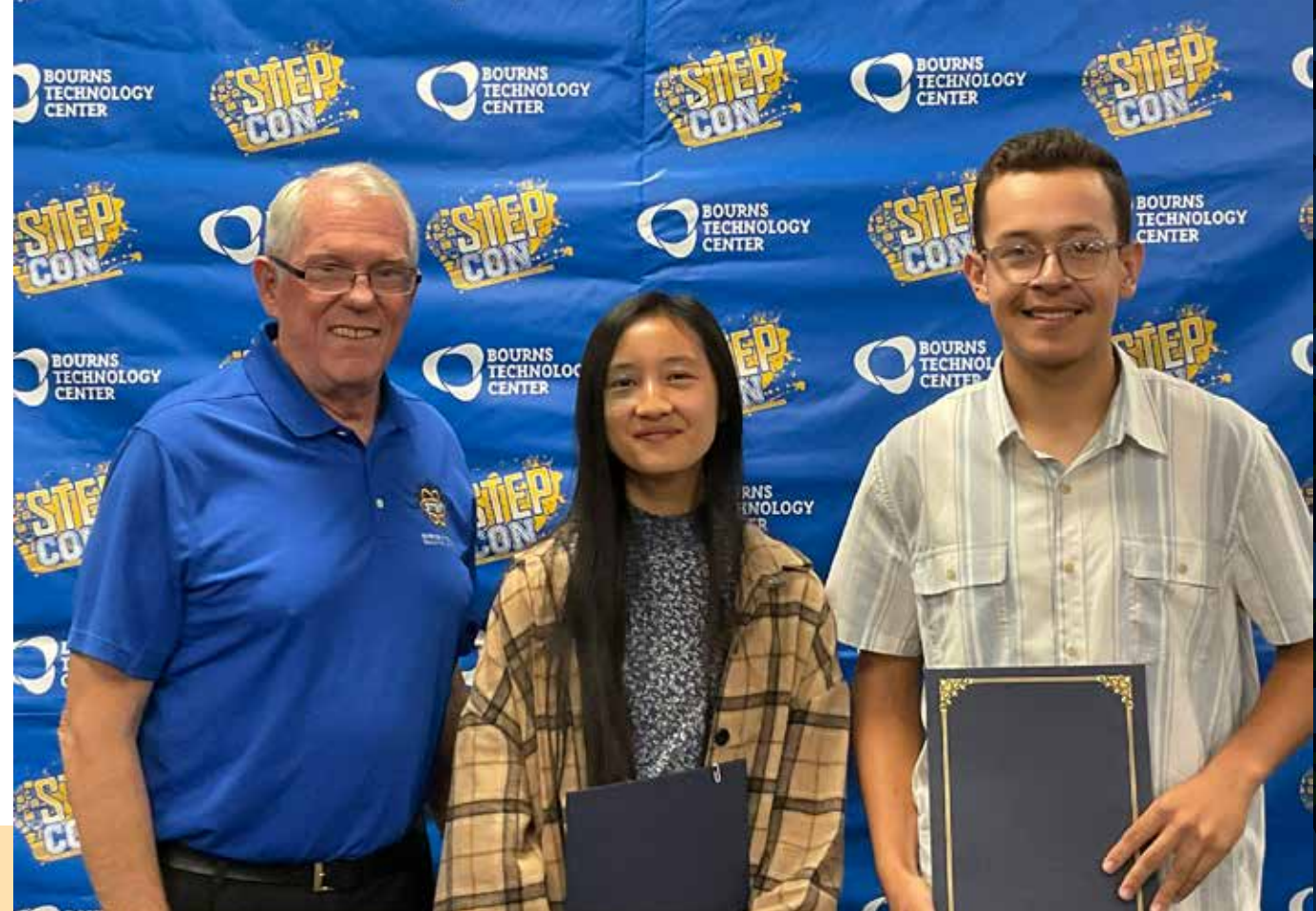
This was our sixth year hosting a full conference for educators in our region. The premier STEM focused educator conference in the Inland Empire, Educator STEPCon22 went back to being in-person after being held virtually in 2020 and 2021. On Tuesday, October 11, 2022, 249 registrants that included classroom teachers, school administrators and district and county education staff convened again for a full day of inspiring keynote sessions, engaging

workshops and meaningful networking opportunities. The conference counted with content and speakers that represented a diversity of STEM disciplines and educational levels. From practicing classroom teachers, to district teacher support staff and personnel, to UCR engineering faculty and even a Dean from a local college, participants gained a multi-faceted perspective and insight into STEM teaching and practice in our region.

**“Sessions were great. I love the hands on session. Learn by doing is what students need to learn and use their creativity.”**  
Participant



Educator STEPCon22, Bourns Technology Center, October 2022



Educator STEPCon22, STEM Scholarship Recipient, October 2022

A highlight of the educator conference is the recognition and awarding of scholarships to outstanding Inland area youth from both San Bernardino and Riverside Counties. Applicants must demonstrate the impact and effect of STEM education on their lives through a pre-recorded video presentation. Recognized applicants receive the opportunity to address conference participants through a general session presentation. This year it

was our pleasure to award \$1,000 scholarships to two very deserving students, Annie Hu and Matthew Martinez, whose stories and experiences resonated with our committee and educators everywhere. Their winning submissions can be viewed [HERE](#).



As the premier student STEM conference in the Inland Empire, we held a hybrid event on October 6, 2022. A hybrid event allowed for participation either in person or virtually so that students from throughout the Inland Empire could engage. We had a total of 11,085 students attend either in person or virtually, either through their classroom teacher registration or their own individual registration. By allowing students to individually register, the engagement of students increased greatly. Our average participation time virtually was over 5 hours which is double the time that students attend our live program. Students shared that after attending STEPCon 22, they believed:

- **Attending college is important**
- **Science, technology, engineering and mathematics are more interesting than before.**
- **A STEM Career would be rewarding**

**“I like that the videos & articles gave me a lot of information and some videos made me want to maybe do it in the future.”**

*Virtual Student Attendee, STEPCon 22*

**“What I liked most about STEPCon is seeing and learning all about mathematics, science and engineering.”**

*Student Attendee, STEPCon 22*

**“I liked that it was a fun experience and that we were able to see & view people’s success.”**

*Virtual Student Attendee, STEPCon 22*

**“I liked that there were a lot of people talking about science and they helped me learn more about it.”**

*Student Attendee, STEPCon 22*

## SCIENCE SHOW HIGHLIGHT

Once again the engineers and scientists from General Atomics, led by Rick Lee and Alex Nagy, presented a science show, which continues to be a student favorite. Titled “Professor Matters and Dr. Booms Incredible Electricity Show,” this year’s show focused on the history and scientific concepts behind the phenomenon of electricity. Students were delighted with demonstrations that included tesla coils, launching cans and frying hot dogs (on stage). As part of the show, videos were also shown from UC Riverside and Cal Baptist University students that added a “real-world” element to the presentations. They described and discussed some of the hands-on and building projects (like an electric vehicle and solar boat) they work on at their respective colleges.



*Student STEPCon22, Science Show, October 2022*

**“The area that I liked the most was the show at the beginning of the field trip because it told us how to use a lot of stuff and it was fun but we were learning at the same time.”**

*Student Attendee, STEPCon 22*

## EXHIBITOR HIGHLIGHT

Over 60 exhibitors participated in the hybrid event. They represented various STEM careers including the Navy, National Security Agency, Engineering & Manufacturing, Environment, Education Opportunities, Medical Careers, and Technology. Students had the opportunity to engage directly with STEM professionals at the in-person event while virtual attendees interacted through engaging videos and interactive presentations. An exciting new exhibit at STEPCon22 was the Escape Room presented by the San Bernardino County Superintendent of Schools where students used digital and physical clues to successfully “escape”. For our virtual students, they were able to participate in our Roundtable presentations with NASA/JPL and the National Security Agency.



*Student STEPCon22, Sea Perch Exhibit: Underwater Robotics, July 2022*

In October 2022, we celebrated the 23rd Science show since the inception of STEPCon. During this year, we were able to structure a process that helped us better understand the level of engagement of the show and assess the scientific content, principles, and laws delivered by the show.

Because we have added a virtual platform to deliver the live science show, we use an online platform called Kahoot! to determine the number of students present during the show and to develop assessment segments for viewers at two intervals of the show.

This year we had three shows with a varied number of students each. The first and third shows accounted for only half of the auditorium's capacity, which seats about 450 chairs.

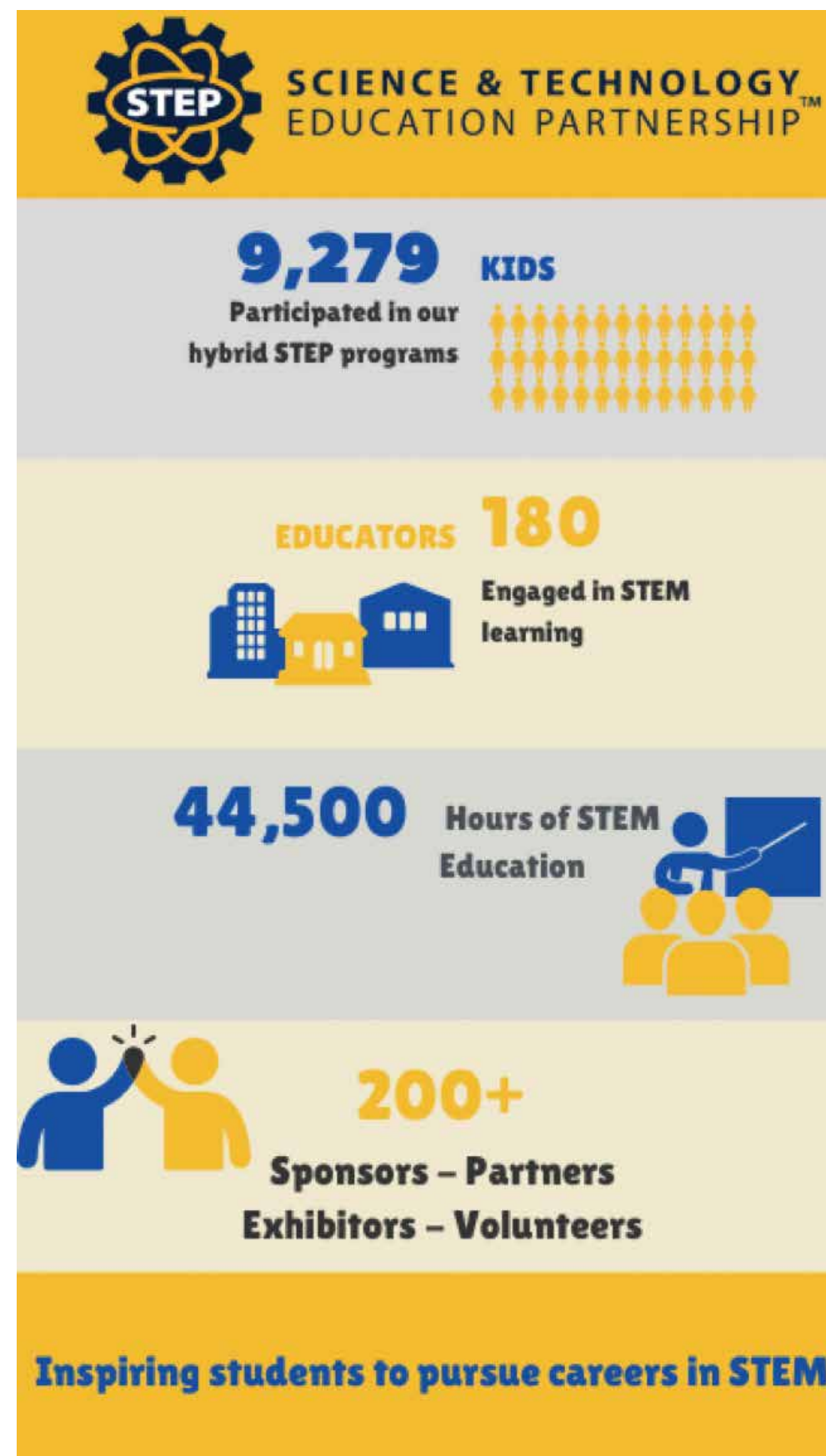
The second show was our most impacted event, which filled the auditorium. The following chart shows the data.

| Name                                    | Date         | Game Mode | # of Players |
|---|--------------|-----------|--------------|
| 2022 STEP Science Show: Questions 1 & 2 | Oct. 6, 2022 | Live      | 198          |
| 2022 STEP Science Show: Questions 1 & 2 | Oct. 6, 2022 | Live      | 190          |
| 2022 STEP Science Show: Questions 1 & 2 | Oct. 6, 2022 | Live      | 410          |
| 2022 STEP Science Show: Questions 3 & 4 | Oct. 6, 2022 | Live      | 395          |
| 2022 STEP Science Show: Questions 3 & 4 | Oct. 6, 2022 | Live      | 167          |
| 2022 STEP Science Show: Questions 3 & 4 | Oct. 6, 2022 | Live      | 179          |

Each of the three shows were streamed live and such an approach helped double the audience engagement and student numbers.

The show of the day was attended by 200 students in the auditorium, and we captured over 400 online participants. The second show had over 400 students and captured about 167 online entries. The third show accounted for nearly 200 students, with an online entry of 179 participants. Due to the nature of the online platform, some participants are represented as teacher's classrooms with 24–32 students each. The information collected helps us to better assess the impact on content delivery, participants' learning, and students' assessment of the scientific principles explored during the Science Show.

Watch Science Show 2022 on 



**COUNSELOR STEPCon**

The focus of STEP since its inception was to provide STEM experiences to students and help them find the educational partner that will help them attain the goals of entering the STEM workforce. The STEP conference did a great job of showing students STEM careers but we were limited to only the students that attended these in person events. In order to continue spreading the importance of STEM, we identified the importance of building the capacity of teachers in the area of STEM to help spread the passion of STEM into the classrooms. This is why we created the Educator STEPCon.

Counselors are key to creating a STEM workforce pipeline and many counselors do not understand the steps that students will need to take for each different type of STEM career. The first Counselor STEPCon will focus on Inland Empire STEM careers and the educational institutions that students will need to attend in order to attain those STEM jobs. We will cover systemic barriers that students face due to master schedule inadequacies and lack of knowledge of the prerequisites needed for these programs. We need counselors to understand the importance of math and accelerated math in many of these programs.

This will be an invaluable asset in creating a comprehensive support system for getting students interested in a STEM job as we will now be providing support to the group educators that have the highest impact on career guidance.

**SUMMER ACADEMIES**

This summer we will expand STEM opportunities to include a 5th/6th grade student program entitled, Patterns, Puzzles and Problems and a 7th/8th grade student program entitled, STEM FUNdamentals. The intent of these academies is to ensure students as early as 5th grade have the opportunity to explore STEM concepts at a younger age so that they are better able to prepare themselves for STEM careers as they navigate through middle school. This positions students to take more advanced coursework in high school as they prepare themselves for a STEM career.

Some of the students who attend STEPCon, have shared that they want to have more confidence in science and mathematics classes at school. The 5th/6th grade summer academy will do just that. Some students share that they want more detailed information about STEM careers and how to meet those requirements. Students in the summer academies will have daily opportunities to learn from STEM professionals and ask vital questions in order to help them develop their own unique STEM pathway.

Then as 9th grade students, they have the opportunity to attend our STEM Summer Learning Labs and continue to develop themselves in their chosen STEM pathway.

**A SPECIAL THANK YOU TO ALL OF OUR PLANNING TEAM MEMBERS WHO SUPPORT THE BUILDING OF A STEM CULTURE IN THE INLAND EMPIRE BY BRINGING OUR STEP PROGRAMS TO LIFE.**

**STEM SUMMER LEARNING LABS PLANNING COMMITTEE MEMBERS**

**Gordon Bourns, Lead**

- |                 |                   |                            |                  |
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| Elliot Emmer    | Kevin Kauk        |                            |                  |

**EDUCATOR STEPCon22 COMMITTEE MEMBERS**

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Kim Terry, Co-Lead**

- |                 |                     |            |
|-----------------|---------------------|------------|
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**STUDENT STEPCon22 COMMITTEE MEMBERS**

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- |                 |                  |                |
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| Arun Raju       | Heather McDonald | Rick Lee       |
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| Carlos Gonzalez | Jimmy Johnson    | Shannon Dadlez |
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