



Summer STEM Camps Can Drive Exposure and Positively Impact Middle and High School Students' Interest and Confidence in STEM Careers

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BACKGROUND

- ❖ Exposure is vital when learning about the opportunities and possibilities available within science, technology, engineering, and mathematics (STEM) careers.
- ❖ Summer STEM camps can provide that exposure through hands-on experiments and innovative instructional teaching to assist students in developing skills such as critical thinking, collaboration, and creativity.
- ❖ Building Bridges, Inc., a non-profit organization (EIN: 82-5445077), was born out of a desire to empower young Black girls by exposing them to STEM education and self-awareness strategies.
- ❖ Chicago State University (CSU) Upward Bound is an academic program designed to provide students with skills and motivation to succeed in high school.
- ❖ Harper College (HC) InZone is a summer enrichment camp that provides a fun and safe learning environment for students ages 6-14 to develop new skills and learning opportunities.

PURPOSE

- ❖ Delivery of two STEM-based summer camps where middle school and high school students were exposed to experiments and concepts relating to biology, chemistry, food science, and circuit engineering through non-profit and academic partnerships

METHODS

- ❖ STEM camps with CSU Upward Bound occurred July 2023 with high school students on the campus of CSU. Students (n=18) in grades 9th and 10th met twice a week (six days total) for 1-hour sessions.
- ❖ STEM camps at HC Inzone occurred August 2023 with predominantly middle school students on the campus of HC. Students (n=15) in grades 4th-9th met for one week (five days total) for 3-hour sessions.
- ❖ At the end of each day, students responded to a survey to share their thoughts about the STEM activity, their interest in STEM careers in the future, and their confidence to pursue STEM.

Table 1. Summer Camp Details

	HC Inzone	CSU Upward Bound
Number of Students (median)	15	18
Grade level	4 th - 9 th	9 th -10 th
Time Commitment	15 hours	12 hours
Geographics	Suburban Chicago	Urban Chicago

MATERIALS

Figure 1. Summer Camp Activity Worksheets

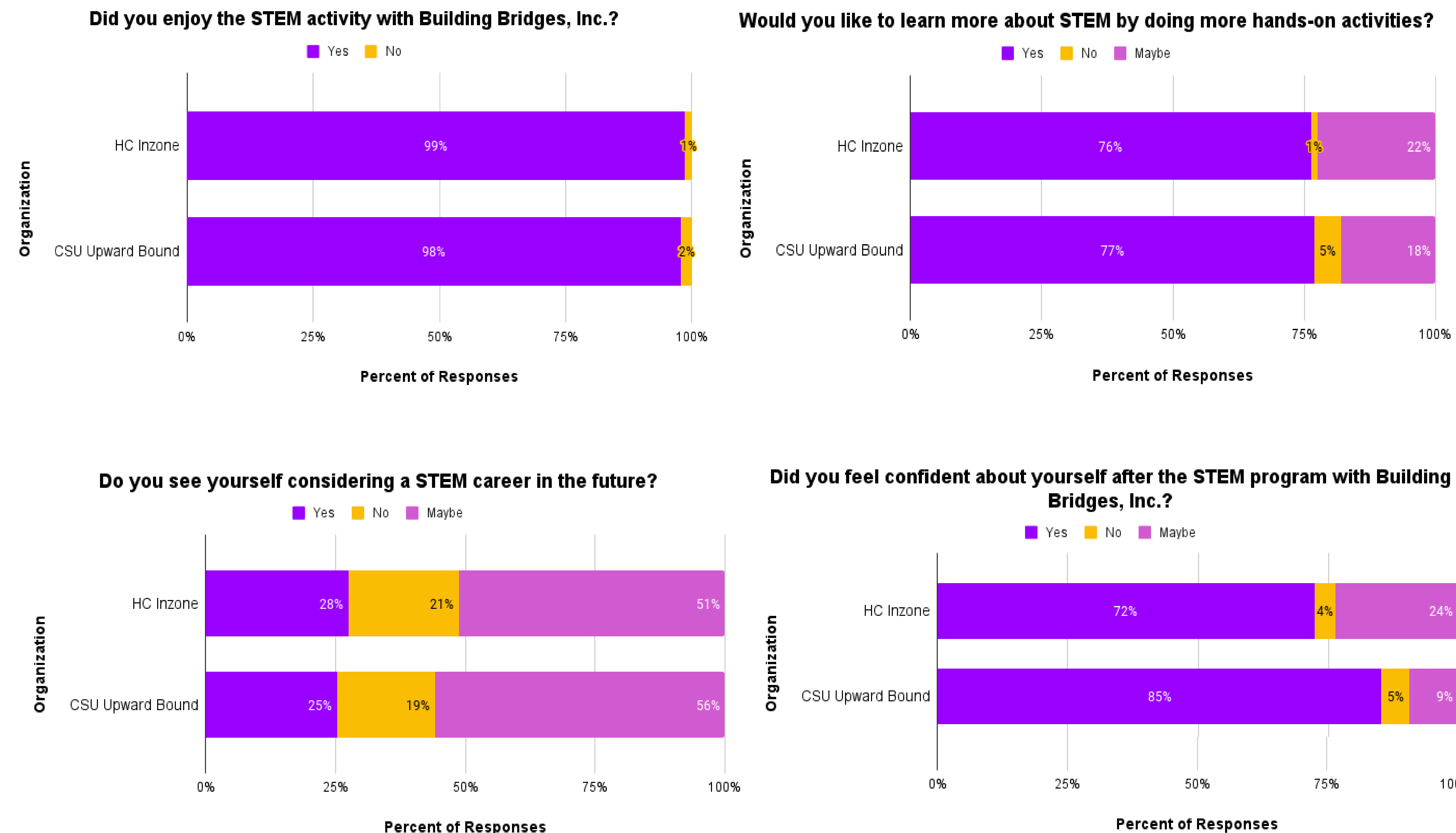
STEM CHALLENGE I Team Name: _____ CHALLENGE Design a gummy candy that includes a fruit containing an anthocyanin. In addition, the gummy candy should satisfy customers that prefer less sour candy. This product has to be shelf stable to not allow bacteria growth and packaged with cool graphics and a creative name to attract customers. CHALLENGE GOALS <ul style="list-style-type: none">• Contain an anthocyanin• Less sour• Shelf stable• No bacteria growth• Creative name & package CHALLENGE PLAN Draw, sketch, or write your gummy design. 	STEM CHALLENGE II Team Name: _____ CHALLENGE Brandon Banana and Ava Avocado went to the beach to enjoy fun in the sun. Unfortunately, both received sunburns. Their physical appearance changed because sunscreen was not applied in time. Brandon Banana's skin started to look similar to Ava Avocado's skin. Brandon Banana was curious to know if he was related to Ava Avocado. CHALLENGE QUESTIONS <ol style="list-style-type: none">1. What sunscreen protection should Brandon Banana and Ava Avocado have applied on their skin before going to the beach?2. Brandon Banana was worried about his skin after getting sunburned. He thought that he looked very similar to Ava Avocado. How can Brandon Banana determine whether or not his traits changed while out in the sun? Is Brandon Banana's traits the same as Ava Avocado's traits after getting sunburned? CHALLENGE GOALS <ul style="list-style-type: none">• Type of sunscreen protection for Brandon Banana & Ava Avocado• Traits of Brandon Banana & Ava Avocado
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Figure 2. Students Participating During Camp Sessions



RESULTS

Figures 3-7. Survey Feedback



CONCLUSIONS

- ❖ 100% survey feedback was received from youth.
- ❖ 98% of students from both groups enjoyed the STEM activities during the STEM camps.
- ❖ 76% in both groups indicated the desire to learn more about STEM by doing more hands-on activities.
- ❖ > 78% students across both groups indicated that they could see themselves considering a STEM career in the future.
- ❖ Overall, survey feedback suggests that middle and high school students may benefit from summer STEM camp exposure through hands-on experiments and innovative instructional teaching that can ultimately play a crucial role in heightening students' confidence, curiosity, and motivation to pursue a career in STEM.

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