Dear friends and supporters of Science Bound,

As we welcome 2020, it is exciting to look back and reflect on some of the exciting milestones Science Bound has achieved this past year:

1) We partnered with a new school district — Clarke Community Schools (Osceola, Iowa).
2) We expanded our program offerings.
3) We welcomed a new staff member who brings a fresh perspective.

These are incredible accomplishments as we continue to serve and impact the lives of our Science Bound scholars and families.

Innovation, growth, and collaboration enable us to continue to offer the best programming for our communities and scholars. Extending the opportunities that Science Bound offers to students and scholars is a huge motivator for our staff. Our work is to empower and support these young people throughout their educational journeys. Our scholars earn the four-year tuition scholarship through their commitment to the program and academics throughout high school. This commitment would not be possible without the support of their families, teachers, and our corporate/community partners. We value these partners and know just how important these relationships are to the success of the program and the students/scholars we work with. Furthermore, the companies we partner with truly understand the importance of a diverse workforce and community and we are grateful that they are investing resources to further this aim.

As the job landscape in agriculture, science, technology, engineering, math (ASTEM) and education changes, so must our programming. Science Bound equips young scholars with the resources needed to explore fields of study and career opportunities in ASTEM. With emerging technology and scientific findings come even more avenues of professional growth. The incorporation of new student programs and events will help our scholars move one step closer to finding the educational and career path that is right for them.

It is my greatest hope that by growing and evolving our program, Science Bound was able to serve, lead, and inspire our scholars, advisers, and partners by even a fraction of the ways in which we see the scholars serve, lead, and inspire their schools and communities.

With gratitude for this program year and excitement for the next,

Dr. Alexis Campbell

Letter from THE DIRECTOR
Create, share, and apply knowledge to make Iowa and the world a better place.

Iowa State University’s mission to “create, share, and apply knowledge to make Iowa and the world a better place” is consistent with what we hold dear here at Science Bound. A focus on:

1. Creating knowledge to support Iowa’s youth and empowering students of color to excel in agriculture, science, technology, engineering, and mathematics (ASTEM) fields;

2. Sharing that knowledge and promoting scholars to share and celebrate their own stories, academic growth, and findings within our communities; and

3. Applying knowledge generated from best practices within the field and Science Bound programming to continually and consistently enhance our scholars’ experiences.

Moreover, the university’s mission continues on to say, “Iowa State’s focus has always been its students. The university emphasizes learning by doing.” The second part of the mission statement is what we are highlighting in this year’s annual report. Our scholars, teachers, families, and staff actively engage in “learning by doing” with intentional reflection on our personal and professional growth. It is through this reflection that our theme for the 2019–2020 school year came to fruition: Serve. Lead. Inspire.

As you read this year’s annual report, you’ll see how our scholars are serving their communities, leading others, and inspiring the next generation to become interested in ASTEM fields. We hope you’re as impressed with their efforts as we are.
Science Bound invites more than 125 eighth graders to participate in the program each year.

This isn’t just any invitation. It’s an invitation to endless possibilities. Where students will meet new people, learn invaluable leadership skills, and lay the foundation for their future. Once families make the commitment to Science Bound, students will participate in the following intentional experiences.

An Orientation for all districts provides personal development and team-building activities where students begin to:

- Form a Science Bound identity,
- Connect with other students and staff, and
- Begin developing a strategy for success.

Algebra Champions (in the Des Moines district) is an educational program that teaches key math concepts students can use in the coming years.

Biweekly Meetings are led by Science Bound middle school teachers with the purpose of developing a local support system among their peers and Science Bound teachers.

The Environmental Sciences and Goal Setting Retreat enables all 8th grade students to come together with their teachers, Science Bound staff, and Iowa State scholars to experience environmental science and develop SMART academic goals. The retreat takes place at the Boone Y Camp and often is a source of fond memories.

A Science Fair is perhaps the most challenging requirement of Science Bound 8th graders. Each school district hosts a local “Nothing Less Than Success Science Fair” where students demonstrate their understanding of the scientific method, gain confidence in their presentation skills, and interact with ASTEM professionals.

Three Science Bound Saturday visits provide opportunities for all pre-college Science Bound students and scholars to visit the Iowa State campus. Students learn about a wide variety of ASTEM fields through activities conducted by Iowa State faculty and staff.

Learn & Earn is an academic program in Des Moines where students increase their math skills and confidence, helping to ensure a smooth transition to high school.

Accountability is a key component of the Science Bound program. To continue within the Science Bound program and earn the title of Science Bound scholar, students must write an essay that communicates what they have gained from their experiences in Science Bound and illustrates how they will contribute to the program if invited to continue. These experiences and requirements will help ensure that students successfully make the transition to high school — both academically and as a Science Bound scholar. It’s also where they’ll be introduced to the importance of serving their community, leading others, inspiring the next generation, and more.
Many of the program’s scholars will be the first in their family to attend college.

Science Bound scholars continue their journey through high school with a portfolio of ASTEM explorations, maintaining GPA and participation requirements, and engaging in family meetings. To ensure the success of our scholars, the program continues to build on what we know about youth development, support networks, and the importance of family throughout this time. While, of course, still emphasizing the importance of serving, leading, and inspiring. High school scholars:

• Participate in weekly meetings led by their Science Bound teachers. This enhances the development of their local support system (including peers and within-school teachers);

• Conduct ASTEM career exploration or Science Fair project to hone their professional interests and develop as leaders;

• Present yearly oral justifications, enhancing their professional speaking skills while ensuring that the scholars reflect upon their year, how they give back to Science Bound and support their local communities; and

• Complete 40 hours of summer ASTEM experiences each year to help build a portfolio of ASTEM career options and interests. Scholars also complete a summer experience log, documenting and reflecting upon their experiences.

• Prepare for college through Countdown to College (C2C) for high school seniors. Many of the program’s scholars will be the first in their family to attend college. C2C provides scholars and families direct access to staff such as Iowa State admissions and financial aid representatives. These professionals help the scholars and families better understand the college admissions process, identify additional scholarships and financial resources, and secure housing.

SCIENCE BOUND SATURDAYS

During three Saturdays each academic year, all students travel to the Iowa State campus for experiences with faculty and staff. This year scholars had opportunities to learn about:

• Actuarial science
• Ames Laboratory
• Chemical and biological engineering
• Chemistry
• Civil, construction, and environmental engineering
• Coding and simple circuits
• Computer science
• Crime scenes and DNA
• DNA assessments
• Electrical and computer engineering
• Engineering problem-solving
• Food microbiology
• Food science and technology
• Forensics science
• Forestry and animal ecology
• Insects
• Materials science and engineering
• Math and statistics learning community
• Minorities in agriculture, natural resources, and related sciences
• Planetarium
• Plant molecular raincoats
• Robotics
• Veterinary medicine

Honors Banquet, the 2019 Science Bound graduates
Serving. Leading. Inspiring. These are just three of the skillsets Science Bound scholars will have the opportunity to strengthen through summer coursework. We’ve added four new program offerings to help our 9th–12th grade scholars complete their required 40 hours of ASTEM work.

CYBOUND

High school and Iowa State scholars had the opportunity to participate in a new summer research experience: CyBound. This is a partnership with faculty members of various disciplines on campus (Drs. Moe Gupta, Jennifer Margrett, Amanda Weinstein, Marna Yandeau-Nelson, and Olga Zabotina), each of whom supported and hosted a scholar researcher for eight weeks during the summer. Throughout this experience, CyBound participants also worked on weekly professional development and team-building activities. The scholars concluded the summer research experiences by presenting their research alongside 97 undergraduate students at the Summer Undergraduate Research Symposium (Ames, Iowa). One CyBound participant’s research was accepted for a poster presentation at the Gerontological Society of America 2019 Scientific Meeting.

CyBound scholars also hosted a STEM exploration event for approximately 50 4th–6th grade students during the STEM InCYte Camp. This camp is directed by Dr. Christa Jackson and designed to help children explore and integrate STEM through hands-on learning and real-world application. They led the students through learning what pH is, conducted measurements, and wrote in their journals about what they learned. The experience ended with color-changing lemonade!
L & E STATISTICS – PRINCIPAL PARTNERSHIP

A new course, Statistics/Actuarial Science, was added to our summer Learn & Earn program in Des Moines. This was thanks to a new partnership with Principal Financial and our combined goals of exposing scholars to the ASTEM area of quantitative science (e.g., actuarial science, data science, statistics), increasing career exposure and real-world application. The course was designed using AP Statistics course content and enhanced by an application feature every Friday provided by Principal Financial employees. Content such as central measures of tendency, distributions, data variations, and probability were further enhanced by the use of multiple methods to solve the problems. The course concluded with scholars taking a tour of Principal Financial. This included a question and answer session about careers. Nine scholars completed the course and many are using what they learned to lead an actuarial science challenge, Modeling the Future Challenge — The Actuarial Foundation, within the Des Moines Science Bound program.

PAPAYA

The PAPAYA (Power and Perception of Youth Action) program piloted in Des Moines July of 2019. This is a new collaboration between Al Éxito and Science Bound and featured two components daily.

A. ASTEM and careers — This feature, led by Cindy Delgado, Iowa State Science Bound scholar, included 40 hours of ASTEM exploration and culminated in field trips to Corteva and the Iowa State campus.

B. The Mathematical Youth-led Participatory Action Research (YPAR) program was created and led by Ricardo Martinez, PhD candidate at Iowa State. The Mathematical YPAR featured three parts:

1. A 10-day, 40-hour program where mathematics was used to create novel research investigations and rich reflection for the participants;

2. Follow-up meetings with individual research groups, analysis of their results, and discussions on how their work can turn into action; and

3. Youth presentations at the Latinx Excellence in the Midwest Conference held at the University of Iowa. Twelve Des Moines-area youth presented their research and future directions at this conference.

The program had no mathematics prerequisites or any other additional requirements. The foci of the project were youth empowerment and early analysis of the data collected on scholar experience. Results show that youth did experience a change in their consciousness due to this experience.

AGDISCOVERY

Science Bound is the new home and lead of the AgDiscovery program for Iowa State. This program is a collaboration between the U.S. Department of Agriculture (USDA) — Animal and Plant Health Inspection Service (APHIS) and Iowa State. AgDiscovery is a highly competitive, two-week summer residential outreach program in its 10th year. The program targets diverse students from across the country, grades 9th–11th, who have displayed interest in wildlife biology and conservation, laboratory technology and diagnostics, animal science, and veterinary medicine. They immerse themselves in a series of workshops, labs, and site visits to learn more about these areas of interest. Anthony Sotelo Sánchez, a Marshalltown scholar, was selected for this opportunity and participated in the program alongside 15 other students.
Serve. Lead. Inspire. This is exactly what five of our Iowa State scholars did on October 26, 2018. Science Bound was asked to put together a discussion panel for Food Science and Human Nutrition’s External Advisory Council. At this meeting, our scholars shared their journeys and, from this, sparked an idea for one attendee, Hormel Foods’ Senior Vice President of Research and Development. It was clear that Hormel had a vested interest in investing in a program that would support the families of their team members. This idea grew into a reality, and Clarke Community Science Bound was established in June of 2019.

We welcomed 10 8th grade students in our first cohort (2019–2020), two Science Bound teachers, and one district administrator. Establishment of the program was additionally supported by HHMI thanks to Dr. Surya Mallapragada, associate vice president for research. The program is a four-way partnership between Iowa State, Hormel Foods, Clarke Community School District, and the students/families of Osceola and surrounding communities.
The Marshalltown High School program began its year with a visit to Grimes Farm and Conservation Center, where scholars participated in team-building activities, explored nature, and shared a meal together. Scholars had a productive fall working on their résumés and the senior class worked with the 8th grade students to help them develop their science fair projects. In the spring, scholars applied for many summer ASTEM experiences as they prepared for their oral justifications.

Marshalltown scholars demonstrated the theme of the 2019–2020 school year (Serve. Lead. Inspire.) by participating in the STEM Festival at Lenihan Intermediate School. There, they researched, created, and hosted five activities for the younger students. As in years past, scholars also participated in Earth Day cleanup where they competed to pick up the most garbage on school grounds. The theme was carried forward during their summer ASTEM experiences by their participation in the Marshall County Iowa State University Extension programs. Science Bound scholars served as classroom leaders for the elementary school age students during the STEM camps and volunteered for the community garden program. The program achieved 100% retention rate for sophomores through seniors.

Miller Middle School Science Bound students participated in an orientation in August, where they were joined by Denison’s 8th graders in Ogden. During the group’s first Science Bound Saturday, they participated in an activity with the Ames Laboratory of the U.S. Department of Energy. In October, they had the opportunity to attend the first overnight Environmental Science and Goal Setting Retreat at the Boone Y Camp. In the spring, they focused on completing outstanding science fair projects, reflection essays, and toured Emerson, learning about the valves and instruments used to control the flow of liquids and gases.

Looking back, Jose Hernandez realizes he didn’t understand how big of an impact Science Bound would have on his life. “When you’re in seventh or eighth grade, you just don’t really understand how big that is — to get free college,” said Hernandez.

But beyond the very significant financial assistance, Hernandez says the program gave him valuable life skills. He said, “The number one thing Science Bound did for me was develop my work ethic. Going to meetings and spending extra time outside of school really showed me that you have to put the time and effort into it.”

Hernandez graduated in May 2019 with a degree in construction engineering. Today he works for Kiewit Building Group as an estimator, creating budgets from plans and drawings. But Hernandez is eager to learn all facets of the company and grow his skill set.

“That’s another thing Science Bound taught me — to have a willingness to learn and keep an open mind. It really helps me professionally,” said Hernandez.
The Denison High School program kicked off the 2018–2019 year with a visit to Deal’s Orchard in Jefferson, where they learned about apple farming, farm-to-table products, and participated in team-building activities. The STEM theme for the high school program was Agriculture Exploration. The scholars explored this theme throughout the year via 16 weekly labs that focused on ag-related careers. They participated in a second field trip to Yellow Smoke Park with Crawford County Extension staff. In addition, scholars participated in four leadership development activities focusing on goals, grades, learning/personality types, and leadership styles. Crawford County Extension offered a summer Agronomy Exploration program with a focus on plant growth and field science. Additionally, 16 scholars attended VetBound (a collaboration with the USDA in Ames) for an all-day STEM-filled event that culminated with making liquid nitrogen ice cream.

Denison scholars demonstrated the 2019–2020 theme (Serve. Lead. Inspire.) at many points throughout the year. Two highlights were their participation in Spanish summer camps over the summer. Additionally, they served as student leaders for a newly developed partnership with Western Iowa Tech Community College’s summer STEM camps. Scholars averaged 95% participation throughout the year across all Science Bound activities.

The Denison Middle School Science Bound program participated in an orientation in August with Miller Middle School 8th graders and Science Bound staff in Ogden. Throughout the year, they focused on fulfilling the requirements of the Science Bound 8th grade program. They had the opportunity to participate in the overnight retreat with all 111 8th graders in the Science Bound program, 19 Science Bound teachers, Science Bound staff, and Iowa State scholars. They then concentrated on developing, executing, and presenting their science fair projects. The 8th graders wrapped up the year by submitting reflection essays.

FEATURING SCHOLAR:
Josh Hatton

Josh Hatton says he would not have had a clear vision for his life post-high school if it weren’t for Science Bound. “I probably wouldn’t have gone to college. Or at least not to a university.”

Hatton’s vision for the future came into focus because he kept an open mind and stayed committed to Science Bound’s process and programs. In particular, a Science Bound shadow day at Iowa State his junior year of high school brought a lot of clarity: “Just getting the experience of being a college student for a day. I could see myself being at this place; it felt normal.”

His advice to students just beginning their Science Bound journey? “Really use the opportunities for the Iowa State visits to explore the different majors,” said Hatton. “The visits can help you stay open-minded to switching and finding a good fit.”

Hatton graduated from Iowa State in May 2019 with a degree in software engineering. Today he works for Securian Financial in St. Paul, Minnesota. His job is to develop and maintain web applications for various financial products. Another successful Science Bound graduate!

DENISON BY THE NUMBERS

PARTICIPANTS: 67
RETENTION RATE: 90%
RETENTION, CLASSES OF 2019–2022: 92%
HONOREES WITH GPAS OF 3.75 OR ABOVE (scholars in grades 10–12): 39%
HONOREES WITH 100% PARTICIPATION: 50%
NUMBER OF TEACHERS: 5
The Des Moines High School program began in July with the Learn & Earn program. The program hosted 106 high school scholars during this four-week intensive math program that introduces scholars to approximately 70% of the math content they will work through the following year. The program also features an agriculture and language arts rotation where scholars were visited by the Iowa State Solar Car Team to reinforce connections between what they are learning in class and college/STEM careers. Additionally, employees from Principal Financial hosted a lunch event for upper-class scholars that focused on career opportunities that utilize math and real-world application.

During the fall, scholars engaged in career research and science fair projects. Thirteen high school scholars qualified for the State Science Fair at Iowa State. In the spring, Hoover and North high schools participated in mentoring circles, a program that brought together professionals from Principal Financial and Corteva to engage with the scholars. They revised their résumés, honed their interviewing skills, and discussed ASTEM majors and the classes needed for their jobs. The program concluded with an official visit and tour of Principal in downtown Des Moines. Rounding out the year, seniors accepted their scholarships during a signing day, which was followed by a group presentation to their peers discussing what they had learned throughout their time in the program, the unique opportunities they’ve had, and how participating in Science Bound will impact their futures. Through this work, senior scholars demonstrated that their commitment to success is an inspiration to their peers.

The Des Moines middle school program kicked off the year with 82 incoming 8th graders participating in Algebra Champions. Students learned what it means to be a Science Bound scholar and were introduced to algebra through the use of manipulatives. Throughout the two-and-a-half-week program, students were given a pre- and post-test that yielded an average score improvement of 150%. Des Moines 8th graders also participated in an overnight Environmental Science and Goal Setting Retreat at the Boone Y Camp and various ASTEM demonstrations while visiting Iowa State. Students at Merrill and Brody middle schools exercised their problem-solving skills through breakout-box challenges and all of the 8th graders reflected on their first year in the program by writing an essay on their experiences.

Lincoln High School

BY THE NUMBERS

<table>
<thead>
<tr>
<th>PARTICIPANTS: 307</th>
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<tbody>
<tr>
<td>RETENTION RATE: 94%</td>
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<tr>
<td>RETENTION, CLASSES OF 2019: 96%</td>
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<tr>
<td>RETENTION, CLASSES OF 2020: 98%</td>
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<tr>
<td>HONOREES WITH GPAS OF 3.75 OR ABOVE (scholars in grades 10–12): 50%</td>
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<td>NUMBER OF TEACHERS: 32</td>
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FEATURED SCHOLAR: Melissa Garcia

Melissa Garcia’s uncle once told her, “Melissa, you’re a role model for my daughters.” And according to her, she wouldn’t be where she is today — wouldn’t be that role model — if not for Science Bound.

The Des Moines East High School graduate is now studying veterinary medicine at Iowa State. But the road to the prestigious vet school was enabled by Science Bound. “I had Science Bound to help me,” said Garcia. “As a first-generation American, it gave me opportunities to excel that I might not have had.”

Between 8th and 12th grades, Garcia committed her time and talent to Science Bound. She leveraged her advisers to focus her studies. Mrs. Victor at McCombs Middle School introduced Garcia to the field of animal science after learning of her interest in animals. Through her agri-science classes and AgDiscovery Camp, Garcia realized she wants to take care of livestock that are part of the food supply.

“I’m so appreciative of animals and their role in the food supply,” said Garcia. “I want to learn how to take care of them and make sure that we can continue to safely and humanely feed the world.”
Each year, high school seniors who have met the program’s expectations earn a full-tuition scholarship to Iowa State to pursue a degree in ASTEM or ASTEM education. The college program was designed with intentional support and programs that promote their success on campus. It includes:

- **Two retreats at the beginning of the fall semester** for the first-year scholars and an additional retreat for all scholars. The first-year retreat focuses on an introduction to the resources that are available to them on campus along with building relationships with the staff. The all-scholar retreat provides an opportunity for the upper-class scholars to engage with the first-/second- year scholars, thereby solidifying the Science Bound and campus communities.

- **First-year seminar**, which supports study skill development and ASTEM field commitment, along with additional exposure to different resources across campus.

- **Second-year seminar**, which focuses on the scholar’s development of their ASTEM identity and helps them prepare for career fairs, summer internships, and research opportunities throughout their collegiate career.

- **Academic Success Program** is designed for scholars who are on probation to meet regularly with the Student Program Coordinators (SPCs) to ensure their academic success for the semester.

- **One-on-one meetings** with SPCs are set every three weeks from fall through spring to ensure first-year scholars are transitioning into college well. This also gives the first-year scholars an opportunity to develop their relationship with staff members in the Science Bound office.

- **Student Advisory Board** was developed in spring 2019 with the vision of providing a voice for the scholars through elected representatives from each cohort. The student advisory board members are leaders who work to impact the programming and future offerings of Science Bound. Additionally, the board helps foster a richer experience and community within the Science Bound undergraduate program. They hosted a movie night, Billiards and Bowling event, volleyball night, and participated in a soccer tournament.
Iowa State Science Bound scholars are actively giving back to the younger Science Bound students and scholars. They are mentors, role models, and leaders throughout the year.

1st Science Bound Saturday – 17 scholars
2nd Science Bound Saturday – 19 scholars
3rd Science Bound Saturday – 24 scholars
8th Grade Retreat – 24 scholars
Des Moines Banquet – 6 scholars
Marshalltown Banquet – 6 scholars
Denison Banquet – 6 scholars
District Events – Average 2–4 scholars

This year Science Bound had the honor of hosting one of our industry partners on campus: Mechdyne (in Marshalltown). Mechdyne’s visit was an opportunity for our scholars to learn more about potential careers at Mechdyne and what it is like to work within their company.
Thank you, Ms. Anita!

We would like to recognize the more than 23 years of service to the Science Bound program by Anita Rollins. Her legacy is the service, leadership, and inspiration she shared with all of our scholars, families, and countless partners of the program.

In her honor, the Science Bound Alumni Society has renamed their scholarship — it is now the Anita Rollins Honorary Science Bound Alumni Society Scholarship. This scholarship, which provides support to two undergraduate scholars each year, serves as an active symbol of her willingness to support Science Bound scholars as they pursue their education. The first recipients will be announced in January 2020. If you are interested in supporting this scholarship, donations can be made through the Supporters tab on the Science Bound main website. Thank you for your hard work and dedication to our program, Ms. Anita.

Welcome Mayra Ramirez

We are excited to welcome Mayra Stephanie Ramirez to our team of dedicated Science Bound staff members. She joins us as the new program manager. Mayra has spent the past five years on Iowa State’s campus with Engineering Career Services and we look forward to her work and expertise impacting our future Cyclones.

Our current staff

Director: Alexis Campbell
Program Manager: Mayra Stephanie Ramirez
Student Program Coordinators:
Jocelyn Drzycimski,
*Denison and Marshalltown Programs (Spanish support)*
Brian Le,
*Iowa State Program*
David Mwirichia,
*Des Moines Program*
Jennifer Velasquez,
*Clarke Community Program and Des Moines (Spanish support)*
Program Assistant:
Tracie Miller,
*Fiscal Liaison and General Program Support*
Administrative Assistant: Kristi Madsen (Fulton)
Graduate Students:
Eli Devine, Carmen Jones, Tyanez Jones, and Ricardo Martinez
CONFERENCE PRESENTATIONS
(Names marked in bold are Science Bound team/family members.)


Castillo, R., Jurado, V., Cruz, V., and Hernandez, Y. Exploring mental health and school safety in Iowa.


PUBLICATIONS


AWARDS

Program Award:
Rose Du hon-Sells Program Award — Awarded by the National Association for Multicultural Education (NAME)

College of Human Sciences Award:
Merit Employee Distinguished Service
Kristi Madsen (Fulton) (Administrative Assistant)

University Award:
Professional and Scientific Council
Woodin Cytation Award
David Mwirichia (Student Program Coordinator)

THANK YOU!

We hope our scholars have encouraged you to live out our theme (Serve. Lead. Inspire.) just as they have done for us.

With much appreciation,
The Science Bound Family
Science Bound is Iowa State University’s premier pre-college through college educational program created to increase the number of racially and ethnically diverse Iowans who earn degrees in agriculture, science, technology, engineering, and mathematics (ASTEM) and education.

Science Bound partners with middle and high school students, their families, and corporate partners in the Des Moines, Denison, Marshalltown, and Clarke Community school districts.

Thank you to our partners and funders.

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