ANNUAL REPORT
FY 2017

THE SCIENCE BOUND WAY

IOWA STATE UNIVERSITY
“Real education should consist of drawing ... the best out of our ... students.” - Cesar Chavez

For more than 25 years, Science Bound has been a collaboration among students and families, school districts, STEM corporate partners and Iowa State University to develop the math and science skills, and bring out the very best, in our students.

From a small mentoring project with six students at one school, to a vibrant and dynamic program annually serving more than 400 students in 19 schools across 3 school districts (and an additional 150+ college students at ISU), Science Bound has become a proven pathway for preparing ethnically diverse STEM professionals. This proven pathway is the **The Science Bound Way**: it’s the way we engage with students, families, teachers, administrators, corporate partners, and Iowa State faculty and staff to bring out the best in our young people.

Thirty years ago, many considered the idea of Science Bound to be daringly outlandish because people of color comprised less than five percent of the state’s population; and because of the longstanding, widespread belief and dominate culture premise that people of color (especially African Americans and Latinos) do not possess the intellectual abilities to excel in mathematics and science. Nearly three decades later Science Bound is doing what was considered impossible - actualizing the potential and abilities of our students to become scientists and engineers.

It has been exciting to lead this initiative. However, this year was my last as director of the Science Bound program. After 11 years, I relinquished the half-time position and returned full time to my ISU faculty role. I am pleased to share that, during my tenure,

- Science Bound grew significantly (264% and 540% at the precollege and college levels, respectively).
- more than 50% of the students who entered the program in 8th grade completed the 5-year commitment (up from 33%),
- multi-year STEM corporate and foundation partnerships grew by 800%,
- nearly 98% of program graduates enroll in college immediately after high school, and
- 135 Science Bound students have earned degrees from ISU (72% in STEM fields), with the class of 2017 being the largest graduating to date.

Together we have empowered and prepared hundreds of ethnically diverse Iowa youth to earn college degrees and pursue careers in STEM fields. I am proud of all WE have accomplished, including expanding the program to Marshalltown and Denison.

It has been my pleasure to serve as the director; I have found this work to be important, meaningful and rewarding. I am hopeful that we will strengthen our investment in developing Iowa’s STEM talent, particularly among Iowa students of color (who are currently 22.5%, and the fastest growing segment, of the Iowa K12 population). Moreover, I am excited to join you on the “friend and active supporter” side of Science Bound! I look forward to interacting with you in the future!

Kind regards,

Dr. Connie Hargrave
Science Bound friends, family, participants, supporters and alumni came together on October 21-22, 2016, to celebrate the longevity and success of this unique program to develop STEM talent. The weekend of events recognized committed corporate partners and individuals who played key roles in the success of the program, showcased the program’s phenomenal graduates and launched a new alumni venture.

On Friday, October 21, SB hosted a Gala to celebrate those who made a significant impact through their contributions to the program, as well as SB’s exemplary graduates. Among those recognized were program visionary Dr. David Hoffman (Distinguished Professor of Chemistry, Emeritus); DuPont Pioneer, for more than $1 million in contributions to the program; Dr. Lenola Allen-Sommerville, SB’s first director; and Gerald Joseph, Des Moines educator, for 24 years as an SB teacher.

On Saturday, October 22, the 400+ precollege SB students gathered on the ISU campus to interact with SB alumni. Graduates of the program shared their struggles and triumphs in high school and college, and what it is like to be a STEM professional.

Science Bound’s 25th anniversary celebrations culminated with the SB Alumni Society’s reunion dinner and dance. More than 150 alumni, educators and friends gathered for the occasion, which included the awarding of the Society's first undergraduate scholarships.
The Des Moines SB Program continues to be the largest, with more than 250 SB students. High school students engaged in the following academic and STEM development activities during 2016-17:

- delved into a STEM topic of personal interest, and presented during oral justifications,
- participated in school-based and national engineering competitions,
- challenged themselves through advanced and novel math activities,
- conducted science experiments; created marshmallow launchers, origami cranes and function machines,
- engaged in a STEM career exploration projects to identify careers of personal interest,
- conducted science experiments and presented during school-based, district, and state science fairs,
- learned about STEM careers from professional scientist and engineers,
- learned about AP course offerings, and
- honed their presentation skills during their oral justifications (a requirement for continuing in the program).
Middle school students actively engaged in a variety of hands on STEM activities, including:

- conducting individual science experiments and presenting findings during the Nothing Less Than Success Science Fair,
- exploring nature and goal setting during an environmental sciences retreat,
- learning about wolf populations, extreme weather, molecular movement, bird beak adaptations, salt water cars and alternative fuels, chemical reactions, catapults and trebuchets, during bi-monthly meetings,
- exploring various careers at a STEM Mentoring Café’ hosted by Ames Laboratory (U.S. Department of Energy),
- meeting their high school Science Bound groups,
- understanding the cost of college and the benefit of a college degree, and
- visiting Gray’s Lake to conduct stream table experiments.

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<thead>
<tr>
<th>SB Class of</th>
<th>F16</th>
<th>S17</th>
<th>Retention 2016-17</th>
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<tr>
<td>District Total</td>
<td>302</td>
<td>251</td>
<td>84%</td>
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**The Science Bound Way**

**Strength to Embrace the Challenge:** Jacqueline Williams

Science Bound students must learn to thrive when faced with the challenges and obstacles that they encounter on the journey towards their degree: that is **The Science Bound Way**. Jacqueline Williams of Des Moines enjoys using the problem-solving skills needed to overcome challenges, and the opportunities that they provide, to grow as a person.

Williams, who graduated with a degree in Civil Engineering from Iowa State University in May, views the demands of STEM as an opportunity to contribute.

“What has most motivated me to study in STEM are the challenges. Engineers are able to solve so many complex problems around the world. I know I have the ambition to help address these problems, too,” she said.

That drive led to many accomplishments (from receiving multiple scholarships to making Dean’s List), but Williams considers her most significant to have been an internship at the Des Moines Water Works at the end of her junior year. But her first challenge was getting an offer: when she applied the first year, she was not accepted. Williams then made this seemingly hard time into a life lesson.

“I learned not to be afraid of failure, as long as you are able to get back up,” she said. Williams followed her own advice, applied for the same position a year later, and was offered the internship.

Williams is an engineer now at French-Reneker Associates, Inc., in Fairfield, Iowa. The environmental, civil engineering and survey services company is a great next step for Williams. She is embracing the opportunity, and she is confident that the challenges will continue to shape her into a stronger leader and professional.
Marshalltown

The Marshalltown High School Science Bound program launched the year with a leadership and team-building retreat at the Boone YMCA Camp in August. The high school program also tested a new family-style model of organization for their weekly meetings, walked in the local Homecoming Parade in the fall and met with the 8th grade Science Bound students to share the benefits of being in Science Bound.

In the spring the group concentrated on resumes and prepared for oral justifications. Oral justification assessments and overall gpa’s improved this year.

The Miller Middle School Science Bound students participated in an orientation in August. They then concentrated on meeting the major requirements of the Science Bound 8th grade program: attending the Environmental Sciences and Goal Setting retreat, completing an exemplary reflection essay and designing and presenting science fair projects.

Denison

The Denison High School program kicked off the year with a two-day retreat focused on self-reliance and team building. Chemistry was the STEM theme of the high school program, and students conducted a variety of experiments and hosted a chemistry science night for Science Bound families. Students also continued to operate in families - a strategy that has resulted in increased student retention. Additionally, they completed career exploration projects and oral justifications.

The Denison Middle School Science Bound program participated in an orientation in August, then began engaged in the major Science Bound projects for 8th graders. Students also worked as teams on a marshmallow challenge to learn about communication and teamwork, and Rube Goldberg activities to better understand how simple tasks can create a chain reaction.

Marilin Rodriguez received the Denison Student of the Year recognition at the Honors Banquet in May.
An Iowa State senior from Marshalltown, **Eli Devine** was involved in band, orchestra, sports, the math team and SB in high school. The busy schedule helped him explore his interests and, with a strict routine, he was able to excel in the classroom as well.

But at ISU Devine faced challenges as he transitioned from being very involved in high school extracurricular activities to having more “free” time at college. In high school there was a routine that flowed well; at ISU, it felt less structured. To succeed, Devine drew on his drive to finish.

“What kept me motivated in computer engineering was that it was a STEM field. It was something I knew I could do,” he said. But there was more to Devine’s ultimate success.

“Passion, and wanting to complete what I had started, was what kept me on track as the course material got harder,” he said. As a result, Devine will complete his B.S. in Computer Engineering in December. He plans to continue on to graduate school for a Master’s degree in architecture at Iowa State next year, where he will blend his engineering knowledge with building design.
By the time high school students each complete the 5-year SB commitment, each student has:

- completed a minimum of 120 hours designing, conducting, and presenting science experiments,
- worked in STEM laboratories with ISU professors, scientists, engineers, and graduate students, and
- determined an area of STEM interest through four major career exploration projects.

SB continues to experience:

- consistent teacher commitment in all three districts,
- high levels of parent participation,
- improved student understanding of academic and career goals as documented by student essays and oral justifications,
- high matriculation of SB students in higher education, and
- high retention of SB students at ISU, and greater than 96% graduation from the university.

The Science Bound Way

The Confidence to Persist: Yaneli Partida

Though naturally talented in school, Partida felt out of place in laboratories on Iowa State’s campus. She said, “In Denison, we are a small school, and we didn’t have access to the kinds of labs that are here at ISU.”

She was able to overcome this seeming disadvantage by reflecting on lessons learned during her visits to the campus and its laboratories as part of Science Bound: she remembered the importance of asking questions. Drawing on the confidence she had built through past successes, Partida’s experience changed.

“I had to understand - I just wasn’t exposed to these resources.” said Partida. “I started asking questions to the teaching assistants, and it got to the point where I started helping others in my labs.”

Now Partida will take her skills to the work place. After graduation, Partida aspires to work in the medical field to bring changes to the way communities of color view doctors, medications and mental health.

All Districts Summary

By the time high school students each complete the 5-year SB commitment, each student has:

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<td>2020</td>
<td>98</td>
<td>80</td>
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<td>High School Total</td>
<td>305</td>
<td>256</td>
<td>84%</td>
</tr>
<tr>
<td>District Total</td>
<td>416</td>
<td>346</td>
<td>83%</td>
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For the Iowa State University program, it was a record-setting year. Nearly 160 Science Bound graduates were enrolled in Iowa State. The incoming undergraduate class consisted of 43 students, and 17 SB scholars graduated during 2016-17.

One hundred thirty-five Science Bound graduates have now earned degrees from Iowa State. Seventy-five percent received degrees in ASTEM fields. This year’s graduates went on to such places as Kimberly Clark in Georgia; French-Reneker Associates, Inc., Keyot Consulting, John Deere, and DuPont Pioneer in Iowa; and graduate school at Iowa State University, Villanova University and the University of Iowa.

Fall 2016
156: Number of SB students at ISU
113: Number of ISU students on SB scholarship

The Science Bound Way

A Focus on Academic Excellence: Daniel Rodriguez

First-generation college students often share similar stories and experiences. What sets Science Bound students apart is a commitment to academic excellence. Daniel Rodriguez, an Iowa State Management Information Systems graduate from Denison, is an example of what it means to pursue excellence The Science Bound Way.

Rodriguez knew that participation in Science Bound was an opportunity to continue his education past high school (something his parents were not able to do). He did not know much about the program when he was selected at the end of 7th grade, but his middle school teachers insisted that he participate. Rodriguez was intrigued by SB because it was supported by Smithfield, a local employer. The opportunity to earn a scholarship to ISU motivated Rodriguez to focus on his school work, and
Science Bound's Countdown to College program assisted both Rodriguez and his parents through the college-going process.

“Without their guidance and help, it would have been rough and challenging,” he said.

According to Rodriguez, having Science Bound support allowed him to stay focused on his academics and take harder math courses, like calculus, during his senior year. That focus led to graduating Valedictorian of his senior class.

The desire for academic excellence continued in college where Rodriguez made Dean’s List every semester for 4 years. As a result of staying focused, Rodriguez landed a job with Keyot Consulting firm in Des Moines, where he provides expertise in computer system design and maintenance.

Rodriguez credits what he learned in Science Bound with helping him achieve his goals. “The program taught me good values such as a strong worth ethic, integrity and dedication. All these values are important to one’s personal and professional life.”

Cameron Creighton, a 2006 Iowa State graduate and Science Bound Alumnus, was recognized by the ISU Alumni Association as a 2017 Iowa STATEment Maker.

To be named a STATEment Maker, the alumnus (32 years or younger) must have demonstrated early accomplishments within their communities and industry, and exemplify the Iowa State spirit.

Cameron Creighton, a 2006 Iowa State graduate and Science Bound Alumnus, was recognized by the ISU Alumni Association as a 2017 Iowa STATEment Maker.

Creighton participated in the Goodrell and Roosevelt SB programs. Since his Science Bound and ISU days, he has taken his talent across the nation, and currently works in Los Angeles as a product manager for Toyota.

Before joining Toyota, Creighton worked for Volkswagen and Steelman Partners. He also earned his MBA from Wayne State University in 2011.

Creighton credits Science Bound for launching him on his career path. “Science Bound steered me toward a more technical degree. It is really the reason that I ended up where I did.” he said (original quote from isualumblog.wordpress).
Corporate Partnerships

The Science Bound Way asks students to go above and beyond to ensure their academic success. Science Bound also has a “way” of interacting with its corporate partners. SB helps companies meet their philanthropic, recruitment and employee engagement goals while securing opportunities for SB students to make meaningful connections with STEM professionals.

DuPont Pioneer
Since Science Bound launched in 1990, DuPont Pioneer has been there, creating opportunities for SB students. Former Iowa State University President Steven Leath noted the importance of the Science Bound and DuPont Pioneer partnership at the program’s 25th Anniversary Gala, where he awarded DuPont Pioneer the Corporate Visionary Award.

“All major initiatives like Science Bound require a diverse team of professionals working together to make a difference. Many corporate partners were at the table when Science Bound began, but few have stayed the course for 25 years,” said Leath.

DuPont Pioneer has contributed more than $1 million to enhance STEM learning opportunities for Science Bound students over the last 25 years. Yet, consistent with The Science Bound Way, the relationship is about more than money.

The ongoing commitment of Pioneer provides SB students with
- hands-on experiences in STEM fields through programs like the College of Agriculture and Life Sciences’ GWC Summer Internship and Next Generation Leadership programs, and
- opportunities to interact with STEM professionals when employees serve as science fair judges and mentors, and host special STEM learning opportunities at DuPont Pioneer facilities.

Smithfield
The Denison Science Bound program was launched with funding from Smithfield in 2007. The program has grown from 14 to 50 students in grades 8-12, and students in college. From the beginning, the involvement of corporate leaders, such as CEO Larry Pope, as well as employees, has been critical to Science Bound’s success in the district. Smithfield signed on to continue support of the program for the next five years.

Remembering Jeff Bottjen
In 2016 the Science Bound program in Denison lost one of its champions. Jeff Bottjen, General Manager of Smithfield, was a friend, supporter and Champion’s Champion who personally and actively encouraged and empowered Denison students to explore STEM fields and pursue college degrees. Bottjen’s presence will be missed greatly.

Scientist at DuPont Pioneer addressed more than 40 Science Bound students as part of an ASTEM fair last July.

Jeff Bottjen (second from left) with Denison high school seniors and Iowa State Science Bound staff at the 2012 Banquet.
WHERE ARE THEY NOW?

One hundred thirty-five SB Alumni have earned degrees from Iowa State University. The map locates where 78% of our alumni have continued their journeys.

Where do SB alumni work?*
- Baker Group
- The Boeing Co.
- Cargill
- Cerner Corporation
- Charles Schwab
- Coca-Cola
- DuPont Pioneer
- General Electric
- JB Swift
- John Deere
- Kimberly Clark
- Iowa State University
- Medimmune
- Monsanto
- The Principal Financial Group
- Rockwell-Collins
- Toyota USA
- United States Air Force
- Ventura Foods
- Voya Financial
- Wells Fargo

*as of October 2016

THANK YOU!

DuPont Pioneer
Smithfield
United Way of Central Iowa
Emerson Process Management, Fisher
Mechdyne
Andersen Corporate Foundation
John Deere
and Private Sponsors