

SCIENCE

B O U N D

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NOTHING LESS THAN SUCCESS!

Letter From the Director

Try STEM!

Have you ever tried on a pair of shoes that just didn't fit you? Whether it was the size, the style or the manufacturer, you knew those shoes weren't for you? But isn't it true, too, that we often don't know what will fit us until we try it? Well, this year we're encouraging our young people to find their fit – in STEM (science, technology, engineering and mathematics)!

I've been talking with our young people about "trying on" majors - adding to their list of career options. And I want them to find out what fits – whether that's through a job shadow, research project, laboratory experience at Iowa State or summer internship.

To help, we're increasing our support and our challenge to students to participate in academically beneficial and STEM-focused summer experiences - several of which are highlighted throughout this issue (pp. 3-5, 8). More information on this will be coming to you in late January or early February.

But we need everyone's help to keep our young people focused on STEM careers. Here's some information that might be useful to share in a conversation with a young person you know:

- Over the past 10 years, STEM jobs have grown 3 times faster than non-STEM jobs
- STEM jobs are projected to grow by 17% from 2008-2018, compared to 9.8% for non-STEM occupations
- STEM workers earn 26% more than non-STEM workers
- STEM degree holders earn more, even if they don't work in a STEM field
- STEM degree holders are less likely to be unemployed
- We as a nation need STEM-savvy citizens

Source: US Department of Commerce, ESA Issue Brief #03-11, July 2011



SB students Jose Amaya and Esmeralda Lopez trying to "find their fit" during a SB visit to ISU.

Exciting things are happening in STEM, and I'm grateful to continue to partner with you to ensure that we are preparing and propelling the next generation of STEM scientists and technicians. Encourage a young person to find his or her fit in STEM today! ■

A handwritten signature in black ink, reading "Connie Hargrave".

Dr. Connie Hargrave
Director

Summer Research to Published Paper

SB Alum's Ambition Pays Off



Jessica Maciel-Hernandez, in the middle, at Turtle Camp.

When Science Bound alum **Jessica Maciel-Hernandez** began participating in summer research as a Lincoln High School freshman, she wasn't thinking too much about her career. She was far more concerned with the prospect of camping for three weeks as part of the field-work.

"The first time I participated in the summer research was also the first time I ever went camping," said Maciel-Hernandez, who's now a senior at Iowa State University (ISU). "I'm a city person, so it was definitely a learning experience in many ways. I didn't know if I would like it or not, but I told myself that I would do it for the whole time no matter what."

Maciel-Hernandez's willingness to try new experiences paid off. After continuing to work with the same research group through college, Maciel-Hernandez earned recognitions as a co-author of a research paper. The research she worked on indicates that among painted turtles

– a species whose gender is influenced by nesting temperature – the mothers choose nesting sites partially based on gender selection.

The summer research program Maciel-Hernandez took part in is called Turtle Camp Research and Education in Ecology (TREE). ISU professor Fredric Janzen runs this ecological research program, which tries to immerse high school and undergraduate students from groups that are traditionally underrepresented in the field. Janzen and his graduate student Timothy Mitchell were the other researchers included as authors on the published paper with Maciel-Hernandez.

Before participating in TREE, Maciel-Hernandez wasn't sure about where she wanted to go with her career. Both TREE and her other work with Janzen's group helped spur her interest in research, and she's now hoping to find a research-related job after graduating. ■



Maciel-Hernandez, left, collecting turtles.

Project SEED

SB Students Work in ISU Labs



From left: Dr. Javier Vela, Luis Martinez, Fatima Jalloh and Abi Contreras.

Through the American Chemical Society's Project SEED, Science Bound participants and Lincoln High School students **Abi Contreras**, **Fatima Jalloh** and **Luis Martinez** worked in Iowa State University (ISU) laboratories for eight weeks this summer. The teenagers learned what it is like to be a chemist while also gaining experiences they say will help them excel in their upcoming classes.

"It's a lot different than science courses you might take in high school," said Martinez, who participated in the program for a second consecutive summer. "Those labs and experiments are designed to almost always work. Here, a lot of times you might fail, but you'll realize that if you change one or two things, you might get a better yield or get a reaction to work."

The Lincoln High School students were guided by ISU Chemistry professors Javier Vela, Emily Smith and Malika Jeffries-El.

The students worked on projects with a wide-range of applications including the creation of

solar cells and increasing the speed of data storage in electronics.

"These types of experiences, which provide students with opportunities to work on research with real-world implications, are critical to ensuring that today's youth understand the role they can play in STEM," said Science Bound Director Connie Hargrave.

In addition, the Science Bound students gain the added benefit of bringing their experiences from Project SEED to their high school courses. This is what Martinez found after working in an ISU lab last summer.

"This program really helped me in my AP Chemistry class," said Martinez. "A lot of the students have problems with lab write-ups, but that was a breeze because I was already used to it."

These are the kinds of benefits Science Bound wants their students to receive from summer programs.

"We're excited to know these opportunities are helping students now," said Hargrave, "but we are also confident they will help them develop into tomorrow's STEM leaders." ■



Martinez, Contreras and Jalloh in lab.

AgDiscovery

Summer Programs Influence Careers



Melissa Garcia Rodriguez at Insect Zoo during AgDiscovery.

Iowa State University (ISU) has more than 50 science, technology, engineering and mathematics majors. Figuring out the right one to choose is a challenge that Science Bound encourages its students to navigate by participating in summer programs that correspond with their interests.

One of these programs is AgDiscovery – a two-week camp through the U.S. Department of Agriculture (USDA) that offers 14-17 year olds a chance to learn about careers in veterinary medicine, animal science, laboratory technology and wildlife ecology.

Melissa Garcia Rodriguez, a junior at East High School, was the first Science Bound student to participate in AgDiscovery this

past summer when she was accepted into the program.

Some of this year's AgDiscovery activities included visiting an ostrich farm, seeing ISU's Insect Zoo and performing necropsies (animal autopsies) on pigs, chickens and sheep.

Rodriguez chose to attend AgDiscovery because she wants to become a large animal veterinarian.

In addition to showing the teenagers different career options, AgDiscovery helps prepare the students for future academic challenges.

"I'll definitely be able to apply what I learned in this program towards my classes next fall," said Rodriguez. "I'm taking Food Science of Animal Origin and Environmental Science. Through what I learned in this program, I think I'll definitely be ready for those courses." ■



Garcia Rodriguez performs a necropsy (animal autopsy) during VetBound (another ISU summer program).

Parent Experience:

The Cason Family



The Cason family. Left to right: Marlano, Sage, Montgomery, Sedalia, Mahalia and Angelena.

*P*arenting a Science Bound student comes with unique responsibilities and challenges. Angelena and Marlano “Moe” Cason are the parents of **Montgomery** – a 12th-grade Science Bound participant at Roosevelt and Central Academy. They were kind enough to share some thoughts and tips about being a Science Bound parent that they’ve learned over the past six years.

Why do you feel it’s important to support your child’s participation in Science Bound?

Angelena: It’s important that we encourage her because she needs to know we are confident in her success not only as a student, but also as a human being. Children are successful when they know their parents believe in them.

Moe: I have always told Montgomery to be a champion in all things in life. Give 100 percent effort in all pursuits because once you give

everything your best, all good things fall into place. I use the phrase “Champions don’t make excuses”.

What are some of the challenges of parenting a child going through Science Bound?

Angelena: I would say the only challenge is scheduling when we can participate in meetings and functions. Other than that, it has been a very natural easy experience . . . We have four very busy children and we both work full time jobs, so it becomes a balancing act. But in the end, we reassure Montgomery that her success is a priority to us.

What tips can you share with other Science Bound parents?

Angelena: Be present. Not just physically, but also emotionally and spiritually. Planting a foundation of positive reinforcement is imperative to children’s confidence in themselves.

Moe: Stay informed and utilize resources.

What has been the best part of parenting a Science Bound participant?

Moe: The best part is witnessing Montgomery blossom into a young woman ready for the world.

Angelena: The best part is watching Montgomery set a goal and pursue it. She is focused and ready to make that transition to college, and in life in general. Science Bound has been an integral part of her education process and we are so grateful for this opportunity. ■

Alum Advice:

Massah Massaquoi



Massah Massaquoi began participating in Science Bound ten years ago. She attended Lincoln High School and then graduated from ISU with a degree in psychology and a minor in biology. Massah now works as a quality assurance specialist at Fenway Health in Boston where

she primarily works for and with HIV-infected and at-risk adolescents and young adults. She's also currently applying to graduate schools with the goal of getting a PhD in Epidemiology. Despite her busy schedule, Massah was willing to answer questions and offer advice to Science Bound students.

What was the most challenging part of participating in Science Bound?

Massah: The most challenging part of Science Bound for me was being proactive about my goals. I wanted to accomplish so much but I wasn't sure how to achieve my goals by myself. Because Science Bound wasn't my primary focus at the time, I didn't allow myself to use all of the resources and opportunities that Science Bound had laid out right in front of me.

What was the most enjoyable part of participating in Science Bound?

Massah: I enjoyed being able to participate in activities that our school didn't offer. For example, we had the chance to tour the National Weather Service Station in Johnson, Iowa.

What advice would you give to current Science Bound participants?

Massah: I have three tips. First, start your freshman year on top. Try to get a 4.0 GPA each semester, but especially your first semester. This helps you stay motivated. If you don't start off well, it will be harder for you to climb up the ladder by senior year.

Next, find an ally. Find a Science Bound teacher, friend or mentor that will help you along the way. This ally can help you get involved in activities and events, and they can be a source of inspiration for your ambitions.

Finally, get involved and have fun. Make memories with Science Bound. Get to know your fellow Science Bound students; they will likely be your first college friends.

What advice would you give to Science Bound participants transitioning to college?

Massah: Take your time and find as many opportunities as you can: scholarships, grants, alternative housing, majors . . . anything really. ■

Science Bound Stats 2013-2014

Number of students participating (Des Moines, Marshalltown, Denison)	387
Percent of SB graduates who go on to post-secondary education	98
Percent of SB students who met or exceeded program requirements (2012-2013)	91

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Seed for the Future Year One

This summer marked the first time Science Bound students benefited from DuPont Pioneer's latest gift. DuPont Pioneer has supported Science Bound since 1999, but the audience at last year's Science Bound Honors Banquet was still pleasantly surprised by the seed company's generosity. DuPont pledged \$400,000 towards funding the George Washington Carver internship program and Learn & Earn.

Seven Science Bound students participated in the 2013 George Washington Carver internship program. These high school and undergraduate students were able to gain research experience in a professional work environment.

Nearly 125 students benefited from the Learn & Earn program this year. Learn & Earn is a four-week summer experience offered to Des Moines high school students where participants earn money during the program based on their performance in math, science and language arts.

"Building tomorrow's leaders in science, food and agriculture must begin today," said Paul Schickler, President of DuPont Pioneer. "Science Bound identifies the students who will provide the imagination, creative thinking and enthusiasm needed to feed the world." ■



A few of Learn & Earn's nearly 125 participants.