

Op-Ed

My Journey in STEM and SARSEF

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(Tucson, AZ) During my first year of college, I received advice from my physics instructors that changed the way I viewed my ability to learn. They impressed upon us the idea that your brain is like a muscle; the more you use it, the stronger it becomes. Applying this attitude in my college education made me realize that asking questions didn't mean I was behind; it meant I was growing. Taking extra time to work through homework solutions didn't mean I was not smart; it meant I was giving my brain a workout. Most importantly, as I saw my own ability in mathematics and physics becoming stronger, I realized it equalized the playing field for students with varying math and science backgrounds, since each student's ability to improve their critical thinking relied primarily on their efforts to spend time practicing that critical thinking.

I recall participating in SARSEF as a 5th grader in 2008. After I designed and executed my experiment with my sister, writing the report and making a poster board presented a daunting task. What does it mean to write a summary of my question, experiment, and results in an abstract? What exactly is the difference between the results and conclusion section? This type of thinking was difficult and challenging. At the time I preferred activities that involved rote memorization, because I knew exactly how to proceed. This exercise differed from classwork in that it required more creativity and critical thinking skills; this challenged me to grow intellectually.

Fortunately, I participated in SARSEF again as an 8th grader as a part of a school requirement. As a high school senior, I worked on a math project for fun and later decided to submit my work to SARSEF. I felt much more comfortable and familiar with the process because of my experience in 5th and 8th grade. The awards from SARSEF and local organizations told me that my engagement in STEM is valued by the community, more than just being something that I enjoy.

This year I volunteered as a SARSEF judge for the first time. The students had outstanding projects and demonstrated such high levels of understanding and critical thinking. During the award deliberations, the other judges drew out and discussed the best qualities from each student's project. Seeing these STEM professionals eagerly discussing various aspects of the projects was itself inspiring.

As a grad student, I am currently working on my first first-author academic journal paper. As I decide what to write in each section, the challenge feels about the same as how I felt in 5th grade, deciding what goes in my results versus conclusion. However, my experience with these

feelings of challenge and unfamiliarity indicates that if I work to improve my skills, incorporate feedback from experts in the field, and continue to practice scientific writing, I will improve to a level far beyond competency. Let the research continue!

Lauren Conger is a PhD student at the California Institute of Technology, studying control and dynamical systems in the computing and mathematical sciences department. She has a B.S. in electrical and computer engineering from Cornell University and graduated from Salpointe Catholic High School in 2015.

Do you have a child in your life who shares a deep curiosity in STEM? Be their champion! Would you consider giving your time and resources to help non-profit organizations like SARSEF (<https://sarsef.org/>). Your engagement could profoundly impact someone's life and help shape a great future for humanity.

Lauren Conger
PhD Student, California Institute of Technology