APPLIED SCIENC

FROM HIGH SCHOOL TEACHERS TO MAPPING ENGINEERS, MOUNT ALUMS HELP INSPIRE A NEW GENERATION TO PURSUE CAREERS IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATH

BY JOANNA BANKS

Middle school science teacher Cristina Solis '98 stood on a chunk of sea ice surrounded by research scientists who were coaxing her to jump into the freezing water. She took the dare, and survived her polar plunge. The feat, during her trip to the Arctic last summer as part of an elite group of teachers, was unexpected yet exhilarating, much like her journey from Mount St. Mary's to her life as an educator.

"I jumped in and it was so cold it knocked the wind out of me," recalls Solis, who teaches at Los Angeles Academy Middle School. "I felt like I wasn't breathing anymore. It's crazy but when people come to the Arctic Circle, they do stuff like that."

Cristina Solis '98 during her expedition to the northern arctic coast of Alaska last summer.

During her five-week stay near Barrow, Alaska, as part of the Polar TREC program (Teachers and Researchers Exploring and Collaborating), Solis was paired with researchers from Cornell University and San Diego State University to study microbial activity in thawing Arctic permafrost. The research is important to better understand how chemicals move through Earth to impact climate change.

While California women are earning more degrees, with the exception of the biological sciences, fewer women than men are majoring in science, technology, engineering and math — degrees that can lead to higher-paying jobs.

Source: 2013 Report on the Status of Women and Girls in California™

Photo: Carrie Rosema

In California schools, both genders continue to improve in math and science performance in their early years, with girls on par or above boys in math but falling behind in science.

Source: 2013 Report on the Status of Women and Girls in California™

Solis represents the many MSMC alums who excel in their areas of science, technology, engineering and mathematics, known as STEM fields. They are teachers, scientists and engineers whose passion for solving equations and understanding life in its most microscopic form inspires those around them. The College's inaugural Report on the Status of Women & Girls in California™, released in 2012, revealed that although women are graduating from college at higher rates than men, far fewer women than men are pursuing degrees in STEM fields such as biotechnology, engineering, and computer and information science. Solis is inspiring a new generation of girls and boys, using enthusiasm, encouragement and her passion for teaching to make science fun and relevant.

On a December day before winter break, Solis' students are putting finishing touches on paper rollercoasters they are building for a lesson on engineering and velocity. Students work in groups to design coasters with paper "tracks" that can hold a marble for at least five seconds. Solis pops into the groups, smiles and jokes with students while offering tips on how to make their projects stronger.

"Ms. Solis helps us a lot," says Kristen Williams, 13. "I like all the projects and experiments that we do in this class."

In a corner of the room, 13-year-old Sergio Maradiaga works quietly on an elaborate curve for his rollercoaster. "I want to be a chemical engineer and go to MIT," he says.

Hands-on projects are hallmarks of Solis' strategy to connect science to real-life experiences for students. Most teenagers can relate to the thrill of a quick drop or an upside-down loop on their favorite rollercoaster. Her curriculum also includes field trips to local museums and science centers to study 21st-century issues, such as alternative fuel sources and climate change. Once a year, Solis and other science teachers choose a handful of top female students to travel to Caltech for a girls' engineering day. The trip includes tours of labs, competitions and opportunities to meet girls from other middle schools who share an aptitude for science.

Natural curiosity and an openness to new possibilities led Solis into teaching. After graduating from the Mount with a double major in business administration and English, she began her professional life working on business accounts for a large advertising firm in Santa Monica. Her off-hours volunteer work with children in Los Angeles grew her desire to teach. She sought out a highly competitive master's in education program at Columbia University in New York and began teaching six years ago.

Moving from the business world to the teacher's lounge hasn't been easy.

There is little downtime between classes for socializing with other instructors. During a recent half-hour lunch break, Solis quickly grabbed a pre-packed sandwich and a diet Coke.

"Before school I'm prepping and after school I'm participating on the learning teams and in meetings," Solis says. "It feels like a 24-7 job in a positive way."

Solis stays current on science trends by working with groups such as the Aquarium of the Pacific, Centers for Ocean Sciences Education Excellence and the World Forestry Institute. In 2009, the organization Earthwatch chose Solis to help research coastal ecology along the coral reef habitats of the Bahamas. "That experience really helped me connect global climate change to my students' chemistry unit," she says.

For a few days last December, Solis was in San Francisco with her Cornell University research partner from the Polar TREC trip to present their findings at a geophysics conference. "There are so many opportunities that teachers can share with their students," says Solis.

"What's really exciting for students is when they see their teachers doing things that aren't just teaching," says Solis, ever vigilant for her next chance to dive into the vast, deep unknown. "They see teachers are not one-dimensional."

Read about the research Mount students and biology professor Luiza Nogaj are conducting on disease-causing proteins. **www.msmc.la.edu/magazine**