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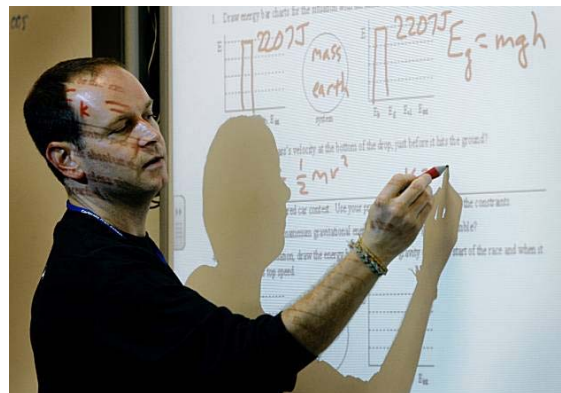
Belmont science teacher heads to South Pole

Jill Tucker, Chronicle Staff Writer

Monday, November 16, 2009

Carlmont High School science teacher Casey O'Hara said goodbye to his students and his warm California classroom and boarded a plane today bound for the South Pole.

There, O'Hara will make ice cream, grow out his beard and play some Sudoku - all in the name of science or, more specifically, the teaching of science.



Casey O'Hara reviews a gravity car exercise before students make ice cream in his physics class.

The 37-year-old will spend about a month at the Earth's southern tip - a place too cold and dry even for penguins - to see science up close and share the experience with his students.

Much of his time will be spent working with researchers installing IceCube, a massive telescope that will detect neutrinos in the Antarctic ice that originate from exploding stars, gamma ray bursts and black hole phenomena.

Sponsored by the National Science Foundation's PolarTREC, he'll also conduct personal experiments including measuring beard growth and his mental abilities in the extreme conditions of the South Pole, keeping an online journal and posting to a blog so his students in Belmont can follow along. The program will also pay for his classroom substitute while he's gone.

"It's really exciting for him, I guess. Not that many people go to Antarctica," said Carlmont senior Kevin Bertolli. "Usually you don't think of the teachers doing big research."

The 17-year-old grinned.

"I want to go," he said. That's exactly what O'Hara wants to hear from his students.

The six-year veteran said his goal is to make science fun and interesting for his students - something often considered at odds with calculating the velocity and mass of a hypothetical train leaving Boston.

In this case, his students will experience real science and the South Pole vicariously.

"It will be an experience that they'll keep remembering even if they forget a couple of equations down the line," he said.

For the past five years, O'Hara has participated in the Knowles Science Teaching Foundation fellowship program, one of a growing number of efforts to improve the skills of science teachers across the country. He was selected from among several applicants to participate in the IceCube project.

O'Hara will work with other teachers across the country to share his experience with their students as well.

On Friday, during his final classes before his trip, O'Hara had the students make ice cream in a plastic bag surrounded by a larger plastic bag filled with ice and salt. The experiment, suggested by a South Carolina teacher's science class, required them to measure the room temperature and determine how long it took for the milk mixture to turn into ice cream. By flipping the bag end over end, it took about 10 minutes. Vigorously shaking the bags shortened the process.

O'Hara will conduct the same experiment outside at the South Pole - wearing gloves and a heavy parka - to see how long it takes there. His students guessed he'll get ice cream much faster when it's 40 below zero instead of 70 above.

O'Hara, a former mechanical engineer, hasn't spent much time surrounded by snow and ice.

"I've been snowboarding a few times," he said.

He isn't quite sure how his body and mind will react to the extreme conditions. He'll be studying and sharing that information, too.

The research station sits at 10,000 feet elevation, where the average summer temperature is minus 40 degrees. It's really windy, unnaturally arid and, at this time of year, drenched in sunlight 24 hours a day.

O'Hara told his students Friday that he'd return with a "big, fluffy beard," and because comparatively it'll be so warm, he'll probably wear shorts for the rest of his life.

Without a backward glance, the teenagers finished their ice cream, grabbed their backpacks and headed to their next class. O'Hara packed away the ice, salt, sugar and cream and sighed.

"I think some of them are bummed they're going to have a sub," he said.

IceCube video

To see a funny and instructive minimovie made by teacher Casey O'Hara about the South Pole's IceCube telescope, go to links.sfgate.com/ZISE.

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Audrey Harris spoons out ice cream students made in Casey O'Hara's physics class.



Nathan Routman tastes the ice cream that students made in Casey O'Hara's physics class.



Students combine ingredients for ice cream, like an experiment their teacher will conduct.



Physics teacher Casey O'Hara (left) helps students make ice cream before leaving for his South Pole expedition.



Eva McAvoy placed ice in a ziplock bag when students made ice cream in Casey O'Hara's physics class at Carlmont High School in Belmont.