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Final Jeopardy: The State of High School Lab Skills

By Joann P. DiGennaro

"First in the World" has a very nice ring to it, and Team USA garnered this prestigious title at the 2007 International Biology Olympiad (IBO). At the 18th annual IBO, which was held at the University of Saskatchewan in Saskatoon, Canada, 193 of the best and brightest high school students from 49 countries participated in the prestigious competition. In an astonishing finish, four young American scholars emerged with top honors and four gold medals. In tandem with this feat, team member Meng Xiao He received the top laboratory score in the competition. These are monumental accomplishments for our youth, especially taking into consideration the challenges that plague this nation's teaching of laboratory skills.

According to the National Assessment of Educational Progress (NAEP), most students do not take four full years of high school science. Only 53 percent of 12th graders polled during an NAEP survey indicated they were enrolled in a science course.

The Council of Chief State School Officers reported that in 2004 only 13 states explicitly mentioned enrollment in a laboratory science course as part of their regular graduation requirement. Of these, only five states—Florida, Indiana, New York, South Dakota and Virginia—required more than one laboratory course.

The Center for Excellence in Education annually sponsors the USA Biology Olympiad (USABO) for

top high school scholars in biology. From this competition, we know that even our best students do not get enough lab time in school each week, as recommended by eminent academic organizations. Many biology teachers have little or no lab training. Lab specimens have become prohibitively expensive for many schools. Lab equipment is grossly outdated in most U.S. schools. Schools fear litigation over accidents and are cutting down on class lab time.

During the USABO National Finals, 20 of the best and brightest biology students across the nation spend two weeks studying with distinguished biology professors and immersing themselves in a university laboratory. Of these 20 students, four are selected to represent the nation at the IBO. Professors at the National Finals strive to design laboratory experiments that enhance their knowledge of theory and challenge their assumptions.

For many of the USABO students, the National Finals marks the first time that they have been given the opportunity to work in depth with sophisticated equipment. Dr. Terry Hufford, academic coordinator for the USABO, explains, "The USABO 20 National Finalists are remarkable scholars, but we realized that for them to take the next step, both at the IBO and in their development as biologists more generally, they needed to apply and test their knowledge through more advanced hands-on experimentation."

Since the United States began competing internationally in 2003, every team member has medaled, bringing home 12 gold, six silver and two bronze medals. CEE recognizes that academically advanced students and their teachers require access to materials, questions and reading. Therefore, the Teacher Resource Center at www.cee.org was developed to level the field and to help both teachers and students understand the principles of scientific inquiry experimentation, theory and practical skills necessary to succeed in the Biology Olympiad.

Our schools need to provide laboratory instruction, allow students to gather evidence during lab experiences, assist students to develop a deep understanding of science and to develop the skills for scientific reasoning. Team USA's rising laboratory scores and four gold medals from the IBO indicate that with the right training and practical hands on lab experience this nation's biotechnology and pharmaceutical industries will remain preeminent in the world.

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