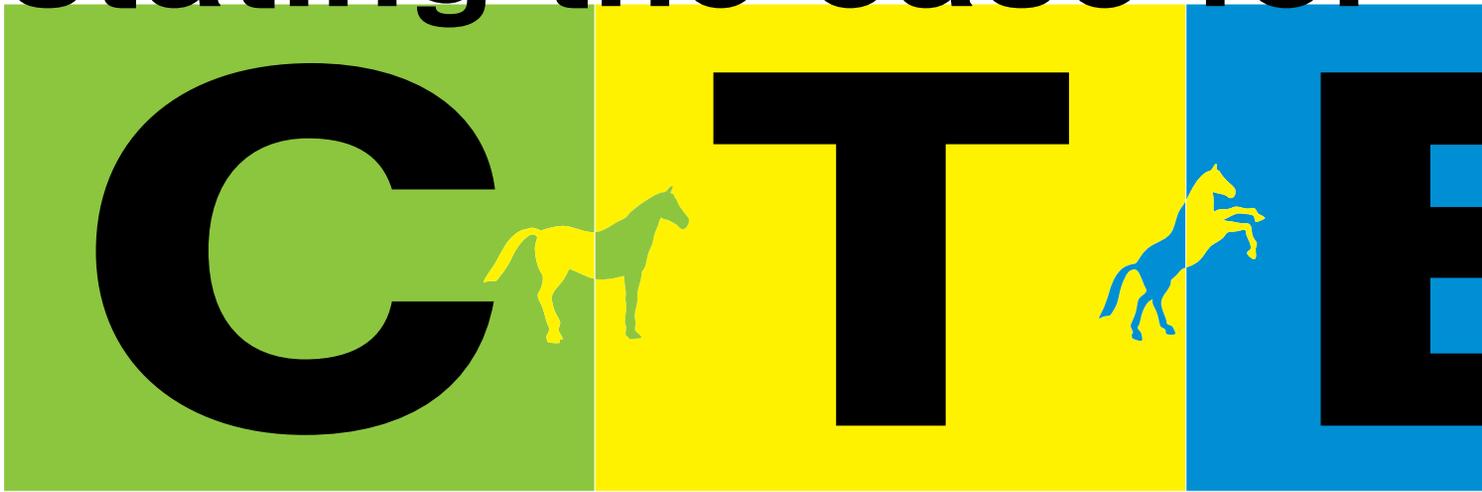


stating the case for



In Arizona, academic success is making a solid case for career and technical education in the 21st century high school.

When ACTE issued its position paper, *Reinventing the American High School for the 21st Century*, it contained much good news about career and technical education (CTE). One of those “good news” items was about integrating academic standards into CTE courses in Arizona.

According to the “Career and Technical Education 2004 Data Snapshot,” compiled by the Career and Technical Division of the Arizona Department of Education, in 2004, CTE high school graduates who took two or more Carnegie units in an occupational program area outperformed the general high school student population taking all three of Arizona’s high-stakes academic tests known as AIMS (Arizona’s Instrument to Measure Standards).

On the AIMS reading test, 65.89 percent of CTE concentrators met or exceeded the standard, as compared to 49 percent of the general high school population. On the writing test, 72.66 percent of the Arizona CTE concentrators met or exceeded the standard, while for the general population it was 54 percent. On the math test, 40.28 percent of CTE concentrators met or exceeded the standard. For the general high school population, the number was 31 percent.

An article that appeared in the *Arizona Capitol Times* in January 2005 also noted the good news about CTE in the state—including the fact that, in 2003, more than 90 percent of CTE students in the state graduated in four years, compared to 72.7 percent of the general student population.

During 2003–2005, Arizona conducted a comprehensive adaptation and update of its 36 CTE programs. Through this process, all programs were reviewed, specific program standards were written, and programs were updated to include

specific reinforcement of state academic standards.

The example cited by ACTE in its position paper was one of the allied health science standards, “Practice Efficient Problem-solving.” Under this standard are several competencies that align with the state’s math standards, such as, “Construct and draw inferences, including measures of central tendency, from charts, tables, graphs and data plots that summarize data from real-world situations;” “Represent and analyze finite graphs using matrices;” and “Develop and analyze algorithms.”

Kevin English, the 2006 ACTE Teacher of the Year, teaches agricultural science at Peoria High School in Peoria, Arizona, and he says that one reason for the good news about CTE in the state is, “We, as career and technical teachers, focus on academics in our classrooms. Students can see the relevance of what they are learning. The light bulb goes off, and they get it.”

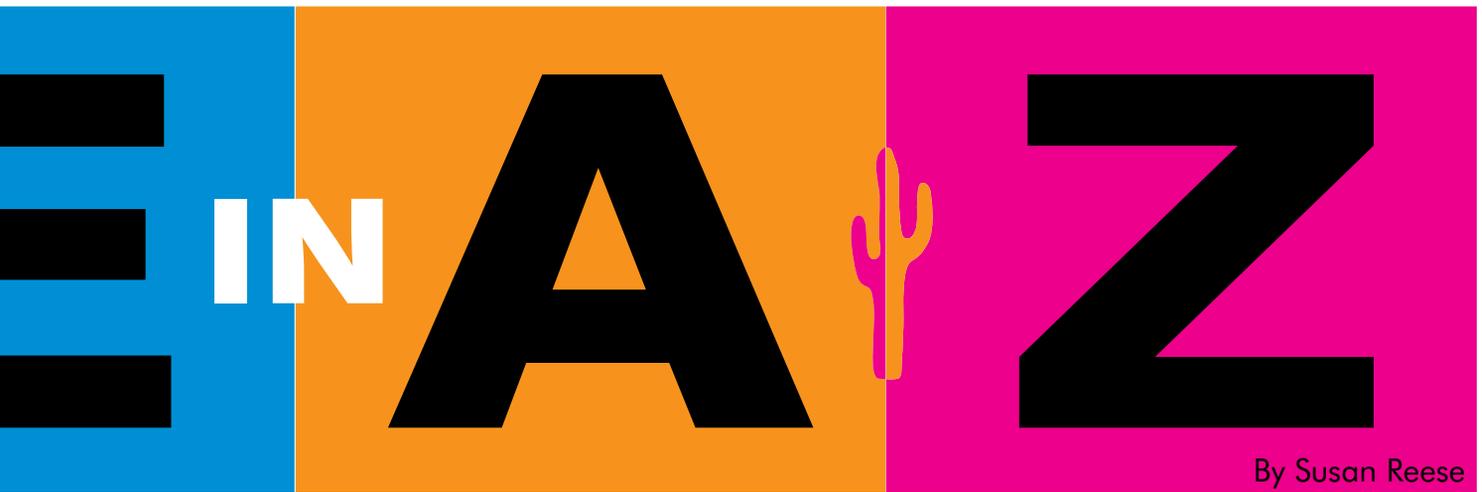
A Good News School

The ACTE position paper cites the Arizona Agribusiness and Equine Center as one of the nation’s schools producing some “good news about academic and CTE integration.”

Founded in partnership with Maricopa Community Colleges in 1997, Arizona Agribusiness and Equine Center, Inc. (AAEC) is a multiple-campus, independent high school district. The community college partnership means that qualified students can take college courses while completing their high school diploma requirements.

The school currently has three campuses: the Paradise Valley Campus, Red Mountain Campus and South Mountain Campus. Each campus is designed to accommodate up to 300

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By Susan Reese

students, and each one is located contiguous or on a community college campus.

The AAEC Web site says that these are the two critical design elements that have become the defining features of all AAEC schools—the high school campus located contiguous or on a community college campus, and secondary students concurrently enrolled in college-level courses as part of their high school course of study.

The open enrollment policy draws a wide range of students from the Phoenix Valley, and once enrolled, these students will find a number of advantages available to them. The college preparatory curriculum includes core courses such as math, English, biology, global studies, chemistry and foreign language.

The rigorous academic content is integrated with technical courses such as biotechnology, animal science, natural resources, veterinary technology and equine science. In the equine science/bioscience program, students study genetics, anatomy and physiology, and applied biological science. The agribusiness program includes classes in business issues/policies, marketing and establishing a business.

The three campuses have adopted focus areas of content in addition to the core content areas of English, social studies, math and science. The South Mountain Campus focus areas are engineering and bioscience. For the Red Mountain Campus, the focus areas are international business and veterinary science. The Paradise Valley campus has developed extensive equine science/animal science and agribusiness programs, as well as leading in the development of pre-veterinary, bioscience and national security areas.



Students at the Paradise Valley Campus of AAEC have the opportunity to work with horses in a reproduction lab.

The Science of Horses

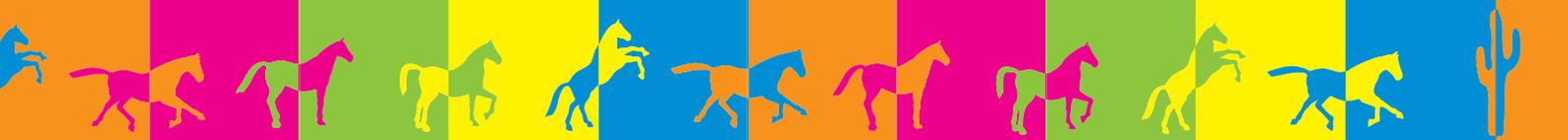
Meg Anema teaches equine science at the Paradise Valley Campus of AAEC, and she says that, at AAEC, they are very strong proponents of the science in the equine industry. They start out with the introductory courses, such as a veterinary assistant techniques class, but they go on to classes in nutrition, sports medicine and reproduction.

The equine industry class takes a good look at the industry as a whole and the career opportunities within it. Guest speakers come in to discuss different careers, and the class is responsible for organizing the annual promotional event, which is a horse fair they refer to as “an equine extravaganza.”

“All through the curriculum, the students do hands-on projects,” notes Anema.

These include the development, reproduction and feeding of horses.

“I have foal watchers who are watching for mares to foal,” she explains. “We are even doing labs with artificial insemina-



An annual promotional event at Paradise Valley AAEC is referred to as “an equine extravaganza.”

tion and ultrasound.”

All of this contributes to helping the students explore their career interests, but it is also preparing them for postsecondary studies, because it is very similar to what they will be studying at the university level.

“They have all of the foundational work, so that if they go into an animal science or an equine science program at any of the major universities, they are very well set up to succeed,” says Anema.

Each fall, four colleges come to AAEC to recruit students because of the extensive equine science and bioscience curriculum the students elect to take. According to Anema, the four schools—New Mexico State, Colorado State, William Woods University and the University of Arizona in Tucson—all have excellent pre-vet and equine science programs. AAEC graduates are already attending the University of Arizona, and AAEC students have been accepted for next year at New Mexico, Colorado and William Woods.

Anema is very excited about the new Certificate of Equine Studies that is being awarded for the first time in 2006. Students who already meet the general AAEC graduation requirements, complete the required equine science and business courses satisfactorily, and receive a grade of C or better in all required courses may receive the certificate.

The Horse as a Teaching Tool

Equine science at AAEC is used to interest students in academics and make their academic learning more relevant. For the equine extravaganza, the equine science introductory class students even create displays showing how the horse can be used as a model in any of the core requirements. For English, as an example, a display might show a book such as *Black Beauty* that students who are interested in horses might like to read.

With all of the science that is being used to improve medicine in horses, Anema says that they can show students, “how we can use the horse to look at biology from the atomic level to the cellular level, the organ level, the system level and the whole organism level.”

She also explains that the horse can be used to study bio-

chemistry and genetics, and several of her students’ advanced science projects are examining genetic problems in horses.

“We have another display where we are looking at horses in math,” says Anema. “We have to use math to do feed conversions or to come up with pharmaceutical dosage rates. The horse is built in proportions and angles, so we’re looking at slopes and angles in geometry.”

She also notes that they can use the horse to track the development of different societies.

“The horse has been there with man every step of the way whenever we’ve had a culture that has been developed,” Anema explains.

Using the horse in all of the core curricula helps the students connect their academics to their love of horses.

For students who may have a problem in a subject such as math or might ask why they have to learn it, Anema says, “We can tell them, if you want to figure out how many pounds of feed to give to get this percentage of protein in the diet, this is what you’re going to have to do. That’s what we find really useful about the horse. For the kids who have an interest in the horse, we can use it to make learning relevant to them.”

The equine science program at AAEC even uses an extra-curricular horse judging project to teach the students communications and critical thinking skills. They have to evaluate a class of horses, come up with an organized format of rationale for their placement, and then give an oral presentation.

Students are often surprised that they can use the horse to learn such a variety of skills and Anema has even heard them make comments such as, “Oh, this does make it more practical.”

Because veterinarian studies and equine science are such a strong interest of many students at AAEC, and “equine” is even part of its name, AAEC at Paradise Valley is referred to by some people as the “horse school.”

However, Dennis Gray, who is the principal of the Paradise Valley campus, says that they would rather be known as the college-prep school rather than the horse school. With its state-of-the-art facilities and strong academic and technical programs, perhaps it would be more appropriate to call the Arizona Agribusiness and Equine Center a thoroughbred of schools.

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Exploring Arizona

For more information about CTE in the state of Arizona, visit www.ade.az.gov/cte.

For more information about the Arizona Agribusiness and Equine Center, visit www.aehighschools.com.