University for You

By Jim Sloan

4-H programs spur teens’ interest in science careers

When most people think of 4-H, they think of farm animals—of young people in white shirts and green ties leading around prized ewes or carefully groomed steers.

But for teenagers like Leah McKinney, 13, of Douglas County, and Kayla Neilson, 17, of Sparks, 4-H also means science. Both girls plan to pursue careers in science, and they credit their fascination with research and scientific methods to their years in the University of Nevada Cooperative Extension’s 4-H program.

Kayla, for instance, begins working on her mining engineering degree this fall at the University after spending 12 years in 4-H. In the last two of those years, Kayla was one of hundreds of Nevada 4-H’ers who participated in the 4-H National Youth Science Day, staging an experiment at the Mathewson-IGT Knowledge Center for local professors, educators and students.

The 4-H National Youth Science Experiment is a one-day, annual event held throughout the United States and anywhere else 4-H groups have formed. The experiments have explored such topics as biofuels and how heightened levels of carbon dioxide affect the planet, and they are designed to spark an interest among youth in science and science careers.

It certainly worked with Kayla Neilson. Her exposure to science education through 4-H influenced her decision to pursue a career as a mining engineer.

“4-H has always been a big part of my life,” she says. “The rewards you get from it are something you can’t get anywhere else.”

As part of the Cooperative Extension System of the United States Department of Agriculture and implemented by the nation’s 109 land-grant colleges and universities, 4-H has been educating youth in the sciences for more than 100 years. More than 5 million youth across the U.S. participate in 4-H science, engineering, technology and applied math in yearlong programs, and 4-H groups throughout Nevada have participated in the national experiment during its first three years.

The national experiment is another example of 4-H’s positive impact on youth. Youth development scholar Richard Lerner, who works with researchers at the Institute for Applied Research in Youth Development at Tufts University, has found that, when compared to other youth, young people involved in 4-H are:

• Nearly two times more likely to get better grades in school;
• Nearly two times more likely to plan to go to college;
• 41 percent less likely to engage in risky behaviors; and
• 25 percent more likely to positively contribute to their families and communities.
Leah McKinney is certainly a good example of the positive influences 4-H can have on Nevada youth. Although only 13, Leah has designed a yearlong science curriculum for her science club in Gardnerville.

You read that right: Leah not only wrote the curriculum, she also designed the experiments performed during club meetings and created the worksheets used in each session. Every other week, her group explores a different aspect of science, from chemistry to geology to physics, which, when studied by a 13-year-old and 20 other young people that age or younger, involves building different styles of catapults and launching pumpkins.

“The whole idea of the club was to get kids excited about science by getting messy and having fun,” says Leah’s mother, Rika McKinney.

Leah’s science experiments are decidedly different than the ones performed in most classrooms. In school, students often know what is supposed to happen and then follow a set procedure to make sure it does. In Leah’s club, the experiments don’t always work—and that’s just the way she likes it.

“Science is as much about failure as it is about success,” she says. “When something goes wrong, you still learn something.”

The club has been a learning experience for Leah in other ways. For all her qualities—the home-schooler received an award from the Western Academic Talent Search for being the highest-scoring seventh-grader on the math section of the SAT in the state and has already completed Algebra 2—Leah is “not a great communicator,” her mom says. She’s somewhat introverted. Although adults are always present during club meetings, learning how to get up in front of a group of boys and girls of different ages and personality types and teach science required Leah to develop some leadership skills.

Leah got the idea for starting her science club after entering and winning science fair competitions and coming away disappointed that more kids were not as into science as she was. She figured her peers just weren’t learning science the way she was learning it—by making a big mess and figuring out what went wrong. So she went to her Douglas County 4-H youth development coordinator, Shannon Montana, with an idea for a new club.

“What other organization can a 12-year-old pitch an idea like this to an adult and be taken seriously?” says Rika McKinney. “They told her to run with it.”

Now Leah—who also is one of 26 finalists for a prestigious Caroline D. Bradley scholarship to a private prep school—is expanding her curriculum for use in other county 4-H offices in Nevada and is scaling down her original teaching plan so it can be delivered at 4-H after school programs elsewhere in the state. Oh, and she and her 10-year-old brother tend their 25-head flock of sheep, too. She is also involved in shooting sports, and according to Montana does extensive breeding and market animal projects each year.

Says her mother: “She’s a very busy person. She’s driven, and we just let her keep driving.”

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This year’s 4-H National Science Day experiment is titled “Wired for Wind” and will have 4-H groups across Nevada and the country design small-scale wind turbines. The event will be held Oct. 5. Check www.unce.unr.edu for details on the time and location.