

Success Stories

Colorado State University
Extension
Douglas County

Sharing the difference CSU Extension makes in people's lives and their communities.

Enhancing school science with 4-H baby chick embryology

Extension helps teachers deliver life science lessons through a meaningful hands-on classroom project.

Situation

Between assessment demands and budget cuts, elementary school teachers are limited in generating the kind of science-based learning their students would remember and enjoy. School enrichment opportunities, such as field trips to museums and natural areas, can be expensive and don't always correlate to curriculum standards. Instead, hands-on science projects based in the classroom offer a meaningful way to enhance and reinforce student learning.

Extension's Response

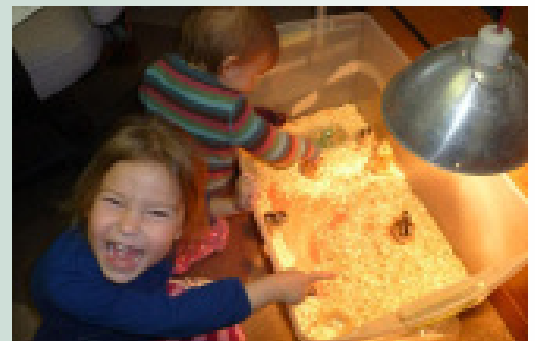
According to the National Assessment of Educational Progress, only 18 percent of U.S. high school seniors are proficient in science and less than 10 percent of college graduates earn degrees in science, technology or engineering. In response, 4-H seeks to engage one million new youth in science programs by 2013. 4-H school enrichment programs such as baby chick embryology, which teaches the life cycle and life science, have the potential to help meet this goal.

Since 2006, Colorado State University Extension in Douglas County has offered one of the state's most robust 4-H school enrichment opportunities through its embryology outreach program. In 2010, Mary Baldwin, Douglas County Extension 4-H youth and outreach agent, provided approximately 1,000 students in 46 classrooms across the county with 4-H baby chick embryology outreach.

The cost to participate in the four-week program is \$45 and includes two classroom visits, lesson plans, record keeping logs, incubator rental, 18 fertilized eggs, sawdust and feed for chicks. During the initial classroom visit, Baldwin introduces the project intended to raise awareness about the role of agriculture and farming in everyone's daily lives. She returns two weeks later to 'candle' the eggs by holding a bright light up to each egg so students can check embryo growth and development and witness possible movement. Chicks hatch after three weeks of incubation and are returned to the farm they came from, although students occasionally adopt chicks for 4-H projects.

To gauge program effectiveness, Baldwin issues an electronic survey to all teachers at the end of each school year (most projects take place during the spring months although a handful occurs in fall). In 2010, 10 teachers, representing 360 students, responded to the survey. In particular, Baldwin wanted to know if:

- Students were demonstrating a positive attitude, were excited about learning or showed a positive change in behavior related to their participation
- Students increased their scientific knowledge because of the embryology project



The Bottom Line

Elementary students introduced to the life cycle through the 4-H baby chick embryology outreach program learn more than basic science information. Overall they:

- Become excited about science
- Gain knowledge of life science and are able to use scientific terminology

Many students:

- Become more responsible during the project
- Are immersed in their learning
- Learn respect and compassion

Contact Information

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Results

Based on teacher responses to Baldwin's survey of embryology outreach in Douglas County, students are increasing their scientific knowledge and gaining an appreciation for living things. According to Baldwin, some increases in scientific knowledge can be related to incubator data collection. Students work in teams to take daily records of incubator humidity and temperature. By talking through data with their teachers, they begin to understand how egg embryo development requires heat, moisture, and egg rotation. Some students also learn about engineering-related facts, such as egg shell strength and design.

Baldwin says these reported gains in scientific knowledge are also directly related to the hands-on learning environment. This response from the 2010 survey reinforces that connection:

"I expect that they'll retain the information much more than if we had covered it by using a text book or just talking about it. By doing it they learned a vast amount of information and they've already taught others about what they learned. This is indicative of a higher level of understanding, something that just wouldn't have happened without the hands-on piece."

The curriculum also encourages teachers to develop additional opportunities for learning technology, math and communication skills. For instance, one first grade teacher has every child in her classroom develop a PowerPoint presentation related to the project.

Beyond science and technology, embryology projects teach students how to cooperate as they develop citizenship and leadership skills. "Students have to work together to take care of the animals," says Baldwin. As another teacher reported in the 2010 survey, "We love the program because it fits perfectly into our school's curriculum and also allows students to show responsibility, compassion for animals and to be completely immersed in their own learning."

"All of the kids were excited to watch the process unfold. The topic surprisingly excited many kids and encouraged them to seek more knowledge around farming and farm animals. They were expected to be gentle and calm with the chicks. Caring for other living creatures presented a great opportunity for them to be responsible."

– From the 2010 survey

Public Hatch

Since 2009, Douglas County Extension has hosted an annual "public hatch." In the first year, 60 community members stopped by the Extension office to see candled eggs and to watch baby chicks hatch. In the second year, Extension agent Mary Baldwin created an expanded children's program that included take-home activities on the life cycle of the chicken. Attendance between these two years nearly doubled. Several first year attendees called the Extension office to find out if the 'public hatch' was being repeated. During both years, families made repeat trips to view the eggs and chicks.

The 'public hatch' not only educated youth and adults, it attracted many first time Extension visitors who learned about the diverse programming offered through CSU Extension. The 'public hatch' is moving to a new location in 2011. Please call Douglas County Extension for more information.