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Today on Across the Fence we're cracking open a story that involves thousands of Vermont school kids who are getting a hands-on educational experience through the UVM 4-H Program. Good afternoon and thanks for joining us, I am Judy Simpson. Embryology is basic science in simple terms it's about the development of an embryo from a fertile egg to a fully developed chick. The 4-H Embryology Program teaches the basic science and much more to students across the state. Both teachers and students applaud the program for its hands-on introduction to learning. We're going to start with a look at what's hatching in the 4-H Embryology Program. Here’s Across the Fence’s Keith Silva who visited a school in Southern Vermont where embryology is a classroom favorite.

Tom Fontaine: Mrs. Fajans, Mrs. Manning could you pass out those eggs.

Kurn-Hattin School science teacher, Tom Fontaine, is about to give the students in his biology class an … ahem … un-egg-spected surprise.

Fontaine: ‘Oh, it’s not an egg? What is it? It’s what came from the egg. I’d like you to hold it and observe it please.’

The eggs hatched a few days ago. This is the first time that these students have held the chicks. In what has become a rite of spring … the UVM Extension 4-H Embryology program provides grades K-12 across Vermont with a hands-on opportunity to study the developmental process … from fertilized egg to fluffy feathered chick. It’s a program that turns teachers and students alike into mother hens.

Tyler Hitt: ‘I like the fact of being to be able to get up close and personal with chicks … It’s just that kind of thing where not every kid gets, not every kid gets to do an embryology, not every kid get to live up close and turn the eggs everyday like a mother hen would and take care of the eggs as if you were the one.’
As opposed to only learning from a textbook … this project uses the 4-H model of learning by doing to give students more ‘life experience.’

Courtney Bussino: ‘It’s there in real life instead of like learning out of a textbook or just like looking at pictures like you get to actually see it, so, I just think it helps a lot more to learn about it and it’s just a lot more interesting to kids.’

Scarlett Stanhope: ‘You actually get to see it close up and you know that you’re actually there … and you know that it’s true and you can say that in real life you actually got to see this happening.’

Dylan Conklin: ‘when you have something like this and you get to actually feel the eggs and when you see the chicks hatching it makes it feel real and you learn it a lot better like if you were to see all this the steps of hatching on a page it’s really a lot different than having this hands-on experience.’

The 4-H embryology program targets school science curriculums while allowing teachers the flexibility to also include reading, writing, and arithmetic. Fontaine’s class is going beyond biology to include some ‘gross’ anatomy by dissecting an egg that didn’t hatch.

Fontaine: This is hands-on science at its greatest.

Tom Fontaine: ‘When an egg is actually cracked open and we look inside of it, I have to be very calm about it, it’s not easy for a teacher to be calm when you’re not sure what’s going to be in there or when these eggs actually hatch and something I’ve never seen before, so it’s new to me … and so I try to tell them and coach them beforehand you’re going to see a lot of intriguing things that you may think of as that ‘G’ word as gross, but try not to look at it as gross try to look at it as this is something I’ve never seen before so it really isn’t gross it’s intriguing, it’s cool, it’s neat.

In the past, Fontaine has tapped Vermont 4-H for other in-school enrichment programs like forensic science and of course in grafting apple trees. Embryology is the latest ‘development’ between the Kurn-Hattin school and UVM Extension’s 4-H program. Kurn-Hattin joins over 100 classrooms across the state that participate in this educational enrichment activity.

Fontaine: ‘UVM Extension has been there at my fingertips. They are there for you every step of the way. So they’ve been there to give me incubators; to go and buy the eggs, to go and get the eggs and to bring them to me, it’s unheard of. There’s probably teachers out there watching this video going, ‘they do?’ ‘How lucky, you are.’ We are. We’re really lucky to have that relationship with the UVM Extension, I can’t thank them enough … its powerful, it’s powerful stuff and I hope that educators who watch this will say, you know something, I’m going to call them because they should, they really should.’

Fontaine’s enthusiasm for this project has spread to other classrooms … younger Kurn-Hattin students made art projects and got to see the chicks hatch via a live web cam. Encouraging ownership ‘outside the classroom’ is an intangible benefit that Kurn-Hattin principal, Tom Fahner, applauds.
Tom Fahner: ‘it’s not somebody force-feeding it on them it’s what they want to do, and it carries over, this fun cool stuff as they would call it, in science class, it carries over into English, math, social studies and you can see them grow as individuals and want to enhance their knowledge base. That’s what it’s all about, so you start with the staff and UVM, it’s a great opportunity it’s fun to watch.’

The students agree.

Conklin: There’s a lot of benefits and other things that comes with the hands-on experience, like, it makes it feel real and more than just coming out of a textbook you learn a lot more when it’s hands-on.

Bussino: ‘Once you learn something … it’s never going to go away, you always have that knowledge with you so you’ll always think about things differently.’

New knowledge, new ideas, and new experiences … there’s always something hatching when it comes to the UVM 4-H embryology program. In Westminster, I’m Keith Silva with Across the Fence.

Thanks Keith. Joining me here in the studio is UVM Extension 4-H Educator Martha Manning, who is the statewide coordinator for the embryology program. Thanks so much for being with us. I don't think I've ever seen kids so excited in class when they came up with those chicks.

Martha.: It's really a way to excite them about learning not just about science but all different types of learning and it's really rewarding to see how it comes to life in a classroom.

Judy.: You talk about learning can you give us some examples of what it is that the kids learn from this particular program.

Martha.: I think it's really important that the students have the experience of learning to think like a scientist they get to experience what a scientist would actually see and that they're not just reading about in the book there really getting to experience what it takes to take the fertile egg. They're putting it in an incubator. Some of the classrooms decide to turn the eggs by hand which means you have to be responsible and turn them 3 to 5 times every day.

Judy.: Why does it have to be turned?

Marta.: By turning the egg it keeps the embryo from adhering to the inside of the shell. So you have to turn the egg as the mother had would turn the egg with her body by shifting her body weight or by moving on and off the nest. So they learn that and learn how to monitor the humidity and they also are learning to be aware of where does their food come from.

Judy.: That's a huge responsibility to be in charge of this living creature.

Martha.: Exactly but they find their learning the responsibility but there enjoying that and charting it and writing about it and journaling. The neat thing with a school that we saw on that clip the Kurn Hattin school with Tom Fontaine who was the science instructor was that they used a web cam and they shared not only what was going on in their science classroom but they shared it
out the rest of the school by using some computer technology and smart boards so it were shared
with other students who then became interested and G what was going on in the science class.

Judy.: So the school this teacher took the program that you offered and expanded on it.

Martha.: Yes absolutely they did a phenomenal job expanding on it into other curriculum
areas. They used it for art they did meat or projects about chicken and poultry and eggs there
was also math where you're doing calculations. What the students learned through the beginning
of the program when you ask the questions do you think the eggs will get heavier or lighter
during the incubation process? Normally they're going to tell you the egg will get heavier
because they see the embryo is developing into the chick. When in reality the eggs get lighter.

Judy.: Interesting because you would assume that chick would weigh more than the embryo.

Martha.: But because of the air exchanges that are going on and such the eggs actually become
lighter

Judy.: How do you assess the program?

Martha.: There's a number of ways to assess the program. Probably one of the easiest ways to
assess the program is through discussions and feedback with the educators and students
themselves. It's nice because this program has been going on for more than 25 years and to talk
to people who experience the program as young students who are now adults to learn what they
remember about the program and how that has impacted them and how they think about life in
general.

Judy.: So there's a lot involved in the embryology program in terms of equipment like the
incubators as well as the curriculum. That's all supplied by extension?

Martha.: We offer schools and educators the opportunity to purchase equipment. Years ago
UVM used to own that but now we encourage them to own their own equipment. We can
connect them with a supply where we act as a wholesaler and pass them on a good price or they
can purchase equipment locally. They have options on how they can progress. We do provide
them with fertile eggs that they purchase which come out of U Conn or out of Vermont poultry
house depending on the type of bird they'd like to raise.

Judy.: It must tell to have an enthusiasm educator like the one we saw in the video.

Martha.: The educators are the heart and soul of the program because I cannot be in 100 different
schools. It's the educators who really make the program the success that it is.

Judy.: What are some of the reflections you hear not only from the educators but some of the
students as well?

Martha.: I think it was really interesting to see with the Kurn Hattin students last year the interest
in learning about the eggs that didn't hatch. They learn and made observations on those chicks
that did hatch but there was some interest in gee, what happened and what can we learn from the
eggs that didn't hatch.
Judy.: What we saw in the video was kind of an emotional time for the kids it's hard to see.

Martha.: It was but yet they were really engaged and they were really interested in what is there. Throughout the process they have done something called candling in which you shine a bright light through the egg so you can see which eggs are actually fertile and developing and have the embryo inside. Once they knew that those eggs that were going to open did have basically fully developed embryos and then they can learn why those had not hatched. As much as at first they thought it was gross they did go back to the way it was presented to them by Mr. Fontaine in that it was an opportunity to learn.

Judy.: So what happens to all these checks after class?

Martha.: Actually last year was very interesting it was the first year that we actually had a school and that was the Hannaford Career Center in Middlebury. It took a number of the meat bird chicks. And through their classes at the tech center they designed some hoop houses for the chicks and they raised them out. They had students who went in and moved the hoop houses on a daily basis. Who did the feeding and the caring and then after those birds were processed the meat was sold to Middlebury College. It was really interesting it was the first time we actually had schools take the interest in growing them out. Normally schools have the option to return the chicks to us and we find 4-H members or individuals who would like to raise them.

Judy.: The examples we saw in the videos were in school programs. Are there other ways that four each offers embryology?

Martha.: We have some after school programs who have done it. We have some childcare centers that have school age children participate and one of the most growing areas is with home school families who do the project right in their own homes or maybe with a group that gets together. There's a lot of different ways that embryology can be delivered to youth.

Judy.: There are a lot of other hands on opportunities two through four each for kids as well.

Martha.: There are many many nontraditional projects. We have the traditional clubs that most people think of but we also have after school programs summer enrichment type programs. One of the popular ones going on now is robotics and even for young students we use a Lego we do product and forensics GPS Computer Technology there are programs around energy all forms of technology whether it's digital photography or even filmmaking.

Judy.: If a parent or teacher is interested in the embryology program or any other 4-H offering what should they do?

Martha.: I would recommend the contact either their local Extension office or you can call the State 4-H Office that's at 1-(800)-571-0668.

Judy.: Terrific Martha thank you so much for joining us today.

Martha.: Thank you.

Judy.: That's our program for today I'm Judy Simpson we will see you again next time on Across
the Fence.

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