



PennState Extension



4-H

Embryology

School Enrichment Program

2017 - 2018

3rd thru 8th grade

4-H is a community of young people across America who are learning leadership, citizenship and life skills

Welcome to the 4-H Embryology Project!

4-H has provided hands-on learning experiences for classroom students in Northampton County for many years. The embryology project is one of the most popular school enrichment programs in PA. Watching chicken embryos develop and chicks hatch from eggs is an excellent way for students to experience and understand the principles of cell division and embryo development. The project also serves to introduce students to agricultural education which is becoming increasingly more important as urban populations increase.

All 4-H projects meet specific Academic Standards. The Embryology program focuses on PA Science and Technology Standards 3.3.4/7 and SAS 3.1.B.A.4 Biology, Cell Cycles.

For more information, please contact John P. Miller, main: 610-865-2289, cell: 484-560-1654, e-mail: jpm29@psu.edu; or Lindsay Byrnes, cell: 610-984-7392, e-mail: leb5427@psu.edu.

Sincerely,



John P. Miller
4-H Embryology Program Assistant
Penn State Extension



Lindsay Byrnes
4-H Embryology Program Assistant
Penn State Extension

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4-H School Enrichment Embryology Project

Students develop an understanding of biology through direct experiences with living things, observation of embryo development, instruction in avian life cycles, and the basics of poultry production. Students listen, observe, experiment and apply their knowledge to real-world situations while incubating twelve fertile chicken eggs.

Students will:

- Learn through observation about the parts of a embryo and how each part is important to embryonic development.
- Learn how the process of incubation leads to the development of a chick from conception to birth (hatch).
- Learn how to care for and handle chicks.
- Learn about the nutritional value of eggs.
- Structure and function in living organisms.



What does 4-H provide?

An incubator, twelve fertile eggs, feeder and feed, water fountain, a guide to the project, including masters for student handouts, a project book for each student**, instructions for the use and care of the incubator, teacher materials including an Experiments in Poultry Science book and an embryology poster. 4-H retrieves the incubator and all the equipment provided at the end of the project, removes the chicks and transports them to a local farm.

At the beginning of the program, the 4-H program assistant will present one 45 minute in-class lesson which will include:

- a. An introduction to embryology – including concepts of embryo development, incubation, and safety issues.
- b. This presentation includes the viewing of a 15 minute video on “Chick Embryology”.

Upon completion of the program, the 4-H program assistant will pick-up the project materials and answer any questions the students and teacher may have.

*****Third grade and up.***

What does the teacher provide?

An overhead projector; a TV, a VCR or DVD player; a cardboard box, plastic storage bin, or aquarium (to act as a brooder), and a clamp lamp with 60-75 watt incandescent bulb. Extra lessons may be taught by the teacher.

How long does the project take?

The project runs for a two week period.

How much does it cost?

This year the program will cost **\$199.00** for the first class and each additional class will be **\$75.00**. The cost includes the rental of the incubator and equipment, twelve fertile eggs, one lesson given by the 4-H program assistant, and the pick up of equipment and chicks.

<u>Cost breakdown:</u>	<u>First Class</u>	<u>Additional Classes</u>
Incubator rental/replacement cost	\$ 15.00	\$ 15.00
Twelve fertile eggs	20.00	20.00
Program Assistant fee	70.00	40.00
Travel to schools and pick up eggs	54.00	0.00
Penn State fee to support the program	<u>40.00</u>	<u>0.00</u>
Totals:	\$199.00	\$ 75.00

***Payment is expected at the time of program request.
Unless other arrangements have been made.***

How do I enroll my class?

A contact teacher should be identified for the school. The contact teacher should complete one Program Request Form (green) for the entire school and mail with a check, payable to **PSCE Program Account**, to:

Penn State Extension, Northampton County
14 Gracedale Avenue
Greystone Building
Nazareth, PA 18064-9212

The contact teacher will receive a confirmation letter confirming the date and time of the program. John or Lindsay will contact you prior to delivering the project.

Program Disclaimers

1. Penn State Extension is proud to have a 90% hatch rate with our Embryology program; however, we will not be held responsible for the following:
 1. damaged or cracked eggs provided by the hatchery (we cannot guarantee 12 perfect eggs);
 2. unfertile or non-developing eggs;
 3. inclement weather and school power failures.
2. This is a living project with many variables that factor in on the development of chicken embryos. Some chicks may hatch deformed and can be picked on by other chicks resulting in death. Others may not hatch at all – please do not attempt to save chicks by helping them out of the egg or at all without contacting John first.
3. Regardless of the hatch rate, students are still educated about embryonic development. It is our suggestion that students are taught about these variables and potential outcomes.
4. Chicks will be picked up by Penn State Extension and placed on farms. Chicks should not be made available to students. If you have a family interested in chickens for their farm – please have them contact John or Sherry before the program.