	Toolkit and Member's Guide				
PA 4-H Embryology Project Educational Objective	Activity/Lesson (as the student will encounter it along the storyline/during the Embryology Unit)	Meets STEELS Standard	Aligns with STEELS Standard	Anchoring Keystone Phenomena with Essential Question(s)	Investigative Phenonmena with Essential Question(s)
Learn about the variety of life cycles using the chicken life cycle as an example.	PPT: Different types of life cycles; how chicks compare to grown chicken (resemble life cycle) Learn Now video: Life Cycles	3.1.3.A Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction and death.		Chick Embryonic Develoment How does the egg become a chick?	
Learn about the needs of living things and discover how the incubator provides for the developing embryo.	PPT: Natural incubation vs. mechanical incubation via an incubator Member's Guide (MG) pg 3	3.1.6-8.E Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.		Chick Embryonic Development How does the egg become a chick?	Natural vs. Mechanial Incubation How are hen and an incubator are alike? How does the incubator meet the needs of the developing embryo?
Learn about embryonic development. Learn about how the parts of the egg provide for the developing chicken embryo.	PPT: How an egg develops in the hen's reproductive tract. Hands-On: Break out an egg; identify parts of an egg. MG pg 5 & 6	and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.		Chick Embryonic Development How does the egg become a chick?	Egg Development in the Hen What is happening inside the hen before she lays an egg? How does a fertile egg look different from an infertile egg?
Learn about embryonic development.	Candling observations, scientific drawings MG pg13	3.1.4.A Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	3.1.6-8.A Conduct an investigation to provide evidence that living things are made of cells, either one cell or many different numbers and types of cells.	Chick Embryonic Development How does the egg become a chick?	How does one cell becomes an entire living organism? Method/Means of Investigation: Picture of embryo in the egg at the current stage of development; ponder what this is; then share video on cell development
Learn about how the parts of the egg provide for the developing chicken embryo.	External organs in the egg MG pg. 4 & 5	3.1.4.A Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	3.1.6-8.G Develop a model to describe how food is rearranged through checmical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.	Chick Embryonic Development How does the egg become a chick?	What do these parts do? What are the functions of each part of the egg for the developing embryo?
Learn about breeds of chickens and their uses.	Sex linked traits; colors; Breeds (egg laying vs. meat producing)	3.1.1.C Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	3.1.3.C Analyze and interpret data to provide evidence that plants and animals have traits inherited from partents and that variation of these traits exists in groups of similar organisms.	Physical Differences between Birds How are chickens bred to provide different products?	What products do chickens provide for people? Why do those chickens look different?
Learn about the food and fiber system specific to the poultry industry	Learn Now Video: <i>Food and Fiber</i> MG no 9 & 10	3.4.6-8.A Develop a model to describe how agricultural and food systems function, including the sustainable use of natural resources and the production, processing and management of food, fiber, and energy		How Food Is Made How does food get to my plate?	How does a commodity become food I eat? What jobs are there in the Food and Fibre system?
Develop responsibility through care and handling of chicks.	Setting up and maintaining the brooder box; observing chick behavior relative to the distance between the heat lamp and the floor of the box.	noor, and onergy.	3.1.3.B Contruct an argument that some animals form groups that help members survive.	Flock Behavior How do chickens behave in a flock?	Chicks need for warmth Why are chicks huddling/spreadout?
Develop science inquiry skills of observation, comparing, measuring and data recording.	Management of classroom incubator, keeping temperature, humidity, turning and viability chart. Scientific illustration and observational fact MG pg 11, 12, & 13	Science and Engineering Practices in three-dimensional learning; STEELS aligned.			,
Develop responsibility through the management and care of the classroom incubator.	Daily incubator management: monitoring temperature and humidity; turning eggs	3.5.6-8.B Use instrument to gather data on the performance of everyday products.	PA Career Readiness Employability Skills: Teamwork, Integrity, Communication, Respect, Critical Thinking, Professionalism, Reading, Writing, Problem Solving		