

INCUBATING EDUCATION

Louisiana 4-H Embryology



Eighth grade Life Science | Embryology Unit Overview

Dates Unit to Be Taught:

Science Standard: 8-MS-LS1-4

Performance Expectation – Construct and use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of survival and successful reproduction of animals and plants, respectively.

Science Standards: 8-MS-LS1-5

Performance Expectation – Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

Science Standard: 3-LS3-1

Performance Expectation – Analyze and interpret data to provide evidence that plants and animals have traits inherited from their parents, and that variation of these traits exists in a group of similar organisms.

Science Standards: 8-MS-LS4-1

Performance Expectation – Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.

Science Standards: 8-MS-LS4-2

Performance Expectation – Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.

Science Standard: 8-MS-LS4-3

Performance Expectation – Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.

Science Standard: 8-MS-LS4-6

Performance Expectation – Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations of species over time.

Investigative Phenomena: Are chickens and alligators related?



DRIVING QUESTIONS:

1. Does animal embryonic development support or refute the theory of descent with modification?
2. Are reptilian and avian hearts the same?
3. Are avian and alligator lungs the same?
4. Do different species have similar bodily structures?
5. How do beak changes support or deny descent with modification and relatedness of chickens and alligators?
6. How and why have chickens and alligators changed over time?
7. Why do mutations occur, and how have mutations played a role in the evolution of chickens and alligators?
8. Historically, where did the chicken and alligator relationship begin?

LESSON OVERVIEW AND UNIT FLOW:



Lesson 1: Embryological Comparisons

- Driving Question: Does animal embryonic development support or refute the theory of descent with modification?
- 8-MS-LS4-2 and 8-MS-LS4-3
- Investigation: Observe, identify and make comparisons among animals embryonic development by stage



Lesson 2: Chicken vs. Alligator Hearts

- Driving Question: Are reptilian and avian hearts the same?
- 8-MS-LS4-2 and 8-MS-LS4-3
- Investigation: Develop heart models and report similarities and differences.



Lesson 3: Chicken vs. Alligator Lungs

- Driving Question: Are reptilian and avian hearts the same?
- 8-MS-LS4-2 and 8-MS-LS4-3
- Investigation: Develop lung models and report similarities and differences



Lesson 4: Homologous Structures

- Driving Question: Are reptilian and avian hearts the same?
- 8-MS-LS4-2 and 8-MS-LS4-3
- Investigation: Analyze and code figures of various anatomical limbs to construct explanation of anatomical similarities and difference among various modern organisms.
- Color Dem Bones



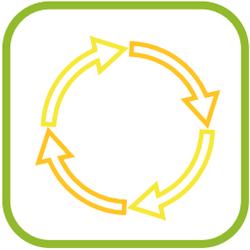
Lesson 5: Beak Evolution

- Driving Question: How do beak changes support or deny descent with modification and relatedness of chickens and alligators?
- 8-MS-LS4-2 and 8-MS-LS4-3 and 8-MS-LS4-6
- Investigation: Create mathematical representation to support natural selection among populations from physical features.
- Beaks of Fury



Lesson 6: Natural Selection

- Driving Question: How and why have chickens and alligators changed over time?
- 8-MS-LS1-4 and 8-MS-LS1-5 and 8-MS-LS4-6
- Investigation: Observe and graph effects of environmental, human and evolutionary factors on natural selection
- Chickens on the Prairie



Lesson 7: Mutations

- Driving Question: Why do mutations occur, and how have mutations played a role in the evolution of chickens and alligators?
- 8-MS-LS1-5 and 8-MS-LS3-1
- Investigation: Describe harmful vs. beneficial vs. neutral effects of a mutation and how to location of genes on chromosomes may affect proteins.
- Changes in the Wild
- Decode the Code



Lesson 8: Cladograms

- Driving Question: Historically, where did the chicken and alligator relationship begin?
- 8-MS-LS4-1 and 8-MS-LS4-2 and 8-MS-LS4-4
- Investigation: Develop argument and model cladograms to show evolutionary and fossil record relationships answering the investigative phenomena.
- NovaLab