



Raptor Resource Project Lesson Plans

To find more plans, go to www.raptorresource.org

Lesson Plan: Eggs-citing!

Grade/Level	Middle School
Time Allotment	1-2 class periods
Content Area(s)	Sexual reproduction, Ornithology, Animal Behavior

Objectives

To understand and describe the process in the female eagle of forming and laying an egg.

Curricular Connections

LS1: From Molecules to Organisms: Structures and Processes
LS3: Heredity, Inheritance and Variation of Traits.

Instructional Materials

Chicken eggs, diagrams of female eagle reproductive system

Resources

- Blog post: How long does it take a bald eagle to lay an egg?
<https://www.raptorresource.org/2020/01/29/how-long-does-it-take-a-bald-eagle-to-lay-an-egg/>
- Reproductive diagram and timetable included with this lesson
- Additional information about eggs from Science Direct:
<https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/germinal-disc>

Background Knowledge

Students should have a basic understanding of sexual reproduction

Opener

What is an egg? Students discuss and come to a conclusion about a definition. Ask which of the following animals come from an egg. This can be through discussion, by vote, or whatever works best for your situation.

- Rattlesnake
- Hummingbird
- Monarch butterfly
- Rainbow trout
- Lily
- White tailed deer
- Leopard frog
- Octopus
- Kangaroo

We often think only of birds when we think of eggs. But all organisms that reproduce sexually produce eggs. All of the organisms listed above produce eggs and come from eggs.

Procedure/Method/Activity

The RRP blog post can serve as background info for teachers or students, or teachers can read/copy excerpts, depending on the class.

- An egg is a cell. Crack a chicken egg into a dish. Examine it. What part of what you see is the actual cell? Look the germinal disk - a small white dot on top of the yolk. Discuss the other parts of the egg.
- An eagle egg is very similar. But what happens in the body of a female eagle before an egg is laid?
- Give students the reproductive system diagram and an empty chart. Have them add information during the class discussion.

Teachers will outline the basic structures, functions, and steps. A diagram of a female bird's reproductive system and timetable of events are included with this lesson plan.

Assessment

- Complete the following about eggs and egg laying in birds, especially eagles:
I used to think: _____
But now I know: _____
- Explain why a female eagle lays 2-3 eggs over a period of several days, rather than close together or all at once. Describe the process.

Extension

- Birds produce hard shelled eggs. List 4 animals that produce soft shelled eggs.
- Why do some animals lay hard -shelled eggs and others lay soft shelled ones?

Diagram of a Female Bird's Reproductive System

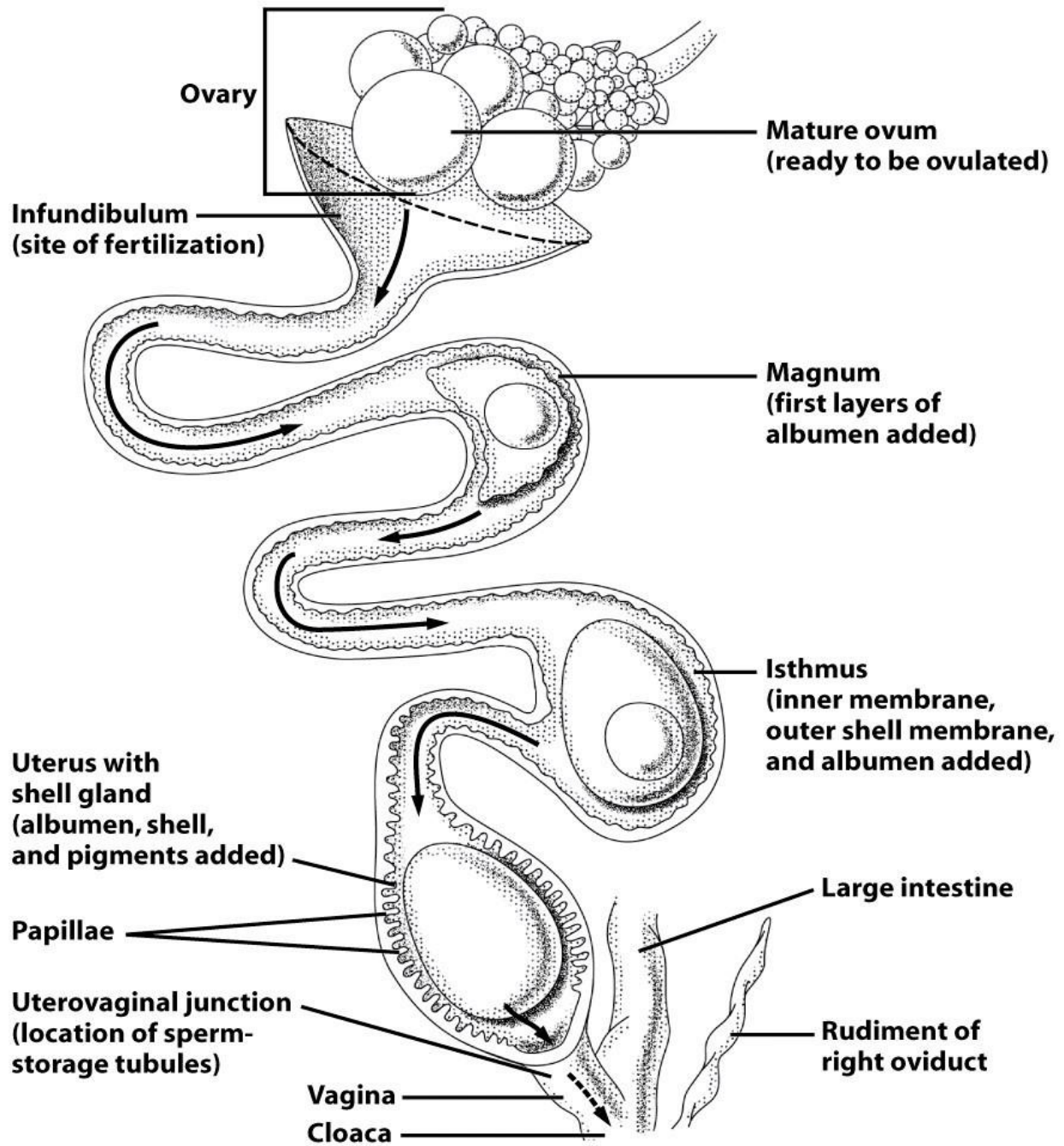


Figure 14-17
Ornithology, Third Edition
 © 2007 W.H. Freeman and Company

Timetable of Reproductive Events

Structure	Function	Time
Ovary	The ovary produces and releases ovum for fertilization.	8-10 days for ovum to mature
Infundibulum	The ovum is fertilized with stored sperm and sealed with a protein coating. The coating forms the first layer of albumen and the chalaza filaments that anchor the ovum in the center of the egg.	15 minutes
Magnum	More albumen is added. This will cushion the embryo and provide much of the protein it needs for its development.	5 hours
Isthmus	Inner and outer membranes are added, along with more albumen. The membranes will protect the egg from bacterial contamination and reduce evaporation through the porous eggshell.	3 hours
Uterus/Shell Gland	Water and minerals are pumped into the ovum. A hard shell is formed around it using calcium from the female eagle's body. If the egg isn't white, pigments are deposited on the hard shell.	39 hours
Vagina	The sphincter muscle contracts, causing the egg to rotate pointed end first. The egg is ejected through her cloaca and into the egg cup.	15 minutes