



Science Unit: *Animal Growth and Changes*

Lesson 6: *Owl Pellet Dissection*

School Year: 2012/2013

Developed for: Hastings Elementary School, Vancouver School District

Developed by: Linda Herbert (scientist); Natacha Corrie and Chris Donegan (teachers)

Grade level: Presented to grade 2/3; appropriate for grades 1 – 7 with age appropriate modifications

Duration of lesson: 1 hour and 20 minutes

Notes: This lesson is a modification of Lesson 16, Dissecting Owl Pellets, in the Temperate Forest science unit, Scientist in Residence Program.

<http://scientistinresidence.ca/science-lesson-plans/temperate-forest/>

Immediately prior to this lesson, the students received a presentation from the Orphan Wildlife Rehabilitation Society (OWL), which included information on owls and other birds of prey as well as a visit by two live birds of prey. Additional information on booking a visit is provided below. <http://www.owlcanada.org/>

Objectives

1. Learn about what owls eat.
2. Discover what an owl pellet is and find out about its contents.

Background Information

See original lesson: Lesson 16, Dissecting Owl Pellets, in the Temperate Forest science unit, Scientist in Residence Program. <http://scientistinresidence.ca/science-lesson-plans/temperate-forest/>

Vocabulary

Owl pellet: Non-digestible parts of an owl's food, which has been compressed into an oval shaped mass in the gizzard (part of the owl's stomach) and is expelled from the stomach via the mouth. The oval shape is due to the oval shape of the gizzard.

Bird of prey: A carnivorous bird that hunts and eats other animals (mammals, other birds, amphibians, lizards, rodents, insects, etc.).

Raptor: A bird of prey that actively hunts for and catches its food. Can be distinguished from other birds of prey by their keen eyesight, strong, curved talons and sharp, strong beaks. Includes hawks, eagles, falcons, ospreys, vultures and owls.

Proventriculus: Also called the glandular stomach. The first part of a bird's stomach, it starts the digestion process using mucus, digestive enzymes and stomach acid (somewhat similar to how human stomachs function).



Gizzard: Also known as the ventriculous or muscular stomach. This second part of a bird's stomach, has no digestive glands and instead aids digestion using muscular contractions as sand, grit or small rocks which the bird has swallowed to assist in this process. The gizzard also acts as a repository for the indigestible food parts (bones, fur, teeth, claws etc.), which are compacted into a pellet and expelled via the mouth.

Materials & Activity Instructions

See original lesson: Lesson 16, Dissecting Owl Pellets, in the Temperate Forest science unit, Scientist in Residence Program and worksheet included with this lesson.

Additional notes - Summary of the pellet formation process:

A bird's stomach has two parts:

- The first part is the proventriculus
- The second part is the ventriculus, or gizzard.

Owls swallow their prey in large chunks. After swallowing, these chunks of food pass down the esophagus and into the proventriculus. Digestion begins in the proventriculus via digestive enzymes and stomach acid. The food mass along with the digestive enzymes then passes into the second part of the stomach the ventriculous or gizzard where the chemical digestion started in the proventriculous continues and manual digestion begins. The gizzard uses strong muscular contractions to aid in digestion. The alternating muscular contractions push the food mass around and grind it with the grit/sand/stones already present in the gizzard.

The soft/digestible parts of the food are allowed to continue along the digestive system into the small intestine. The indigestible parts (fur, feathers, claws, bones etc.) are retained in the gizzard and compacted into an oval shaped pellet (oval due to the gizzard's shape). The digestion process up to this point takes several hours. The pellet is then passed back into the proventriculous where it will remain for several hours before being regurgitated. It is likely that additional digestive enzymes are digesting any remaining digestible material during this time. When the digestive process is finished the owl will regurgitate the pellet. The regurgitation is accomplished via a reverse peristalsis in the esophagus – essentially smooth muscular contractions push the pellet up the esophagus and back into the mouth. In this way the process is different from coughing or retching.

Several videos of the process are available on YouTube including this one: <http://www.youtube.com/watch?v=waLiTmLr1nM> (Note that the commentary is irrelevant and should be muted).

Interesting facts:

- When a pellet is being formed it blocks the digestive tract and thus the animal cannot eat again until the pellet has been expelled.
- Hawks have stronger stomach acid than owls and thus are able to digest bone. As a result hawk pellets will contain little to no bony material.

References

1. Campbell, Wayne et al. 2005. Compact Guide to British Columbia Birds. Lone Pine Publishing.
2. Duke, Gary E. 1997. Gastrointestinal Physiology and Nutrition in Wild Birds. Proceedings of the Nutrition Society, Volume 56, Pp 1049-1056.



SCIENTIST IN RESIDENCE PROGRAM

Extension of Lesson Plan

Have a presentation by Orphaned Wildlife Rehabilitation Society (OWL*). This presentation includes bringing in live owls and other birds of prey to the school. OWL supplies pellets and bone charts as well as a teacher's package.

OWL
3800 72nd St
Delta, B.C. V4K 3N2
Tel. 604 946 3171
Fax 604 946 3172
www.owlcanada.ca.

Painted Lady Life Cycle



adult



egg



pupa

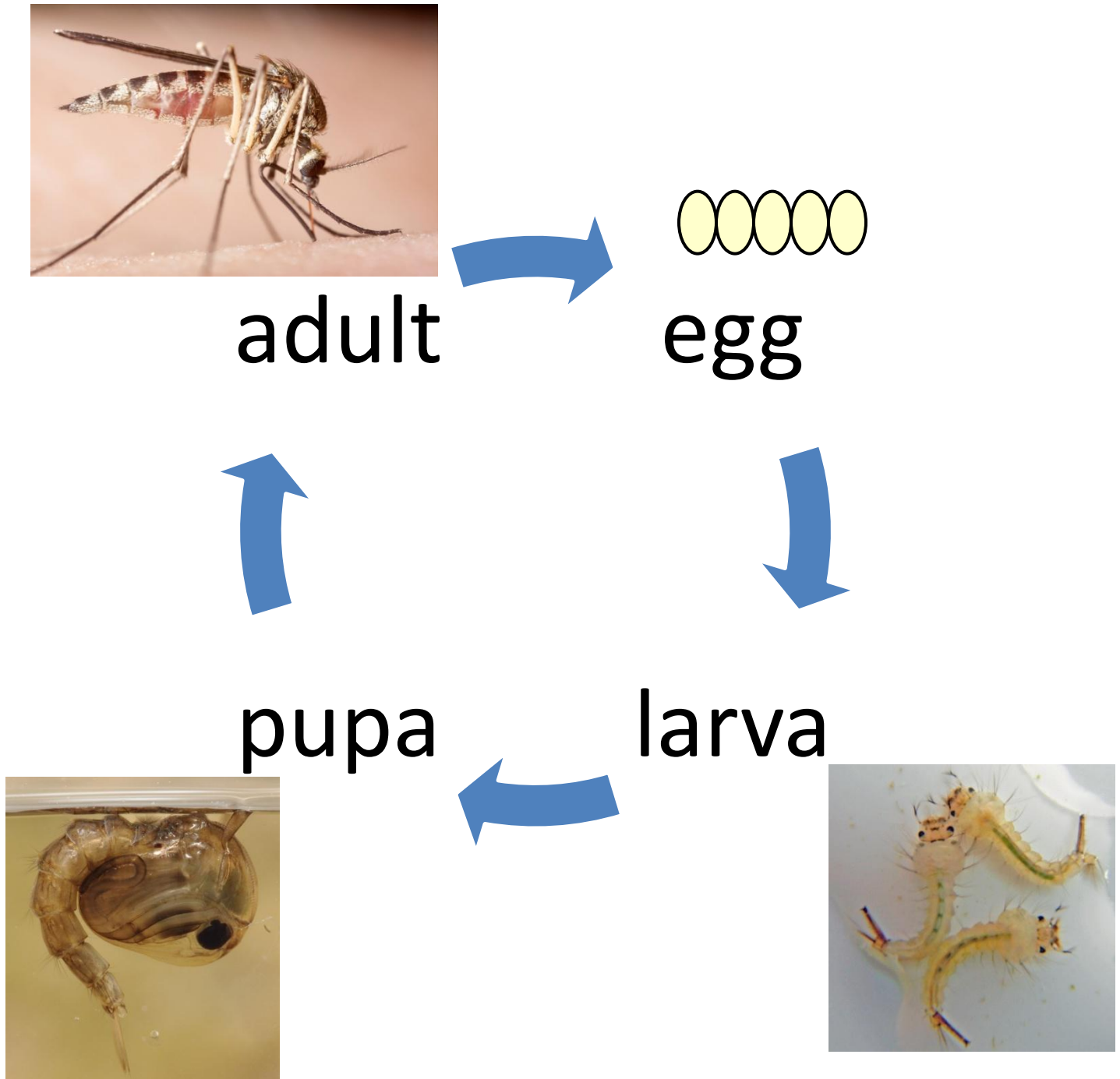


larva



Complete Metamorphosis

Mosquito Life Cycle

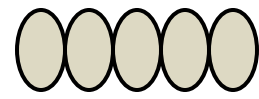


Complete Metamorphosis

Dragonfly Life Cycle



adult



egg



nymph



Incomplete Metamorphosis

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Scientist Name: _____

Date: _____

OWL PELLET DISSECTION

Observations

Describe your owl pellet.

Color: _____ Length: _____ Width: _____

Other observations _____

What is in an owl pellet? Draw or paste your findings here.

Conclusions

What did your owl eat?

List 3 things that owls cannot digest:

1. _____
2. _____
3. _____

The most interesting thing I learned about owls is:
