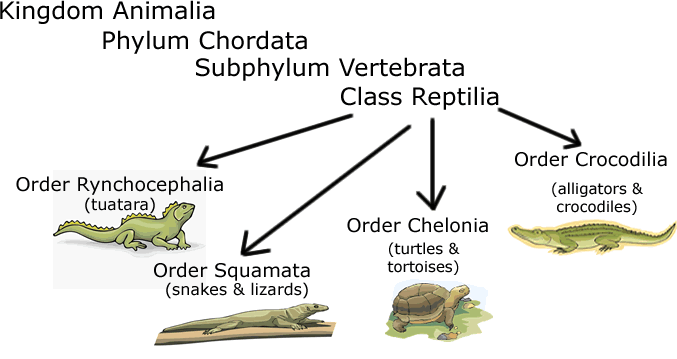
Birds and Reptiles – are they related?

* Birds are thought to have evolved from small dinosaurs
* The hunt for the ancestors of living birds began with a specimen of *Archaeopteryx*, the first known bird, discovered in the early 1860s. Like birds, it had feathers along its arms and tail, but unlike living birds, it also had teeth and a long bony tail. Furthermore, many of the bones in *Archaeopteryx*'s hands, shoulder girdles, pelvis, and feet were distinct, not fused and reduced as they are in living birds. Based on these characteristics, *Archaeopteryx* was recognized as an [intermediate](http://evolution.berkeley.edu/evolibrary/glossary/glossary_popup.php?word=intermediate+form) between birds and reptiles; but which reptiles?
* Modern birds descended from a group of two-legged dinosaurs known as theropods, whose members include the towering *Tyrannosaurus rex* and the smaller velociraptors.
* Bird and reptile worlds are closely linked but scientists disagree on how this looks… an interesting Inquiry project perhaps..

Reptiles

Kingdom Animalia  
---Phylum Chordata  
------Subphylum Vertebrata  
---------Class Reptilia  
------------Orders: Sphenodonta, Squamata, Testudines, Crocodilia



Testudines

Sphenodonta

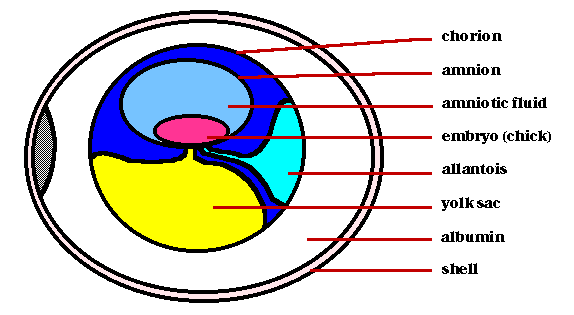
**Characteristics of Reptiles**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
2. Ectothermic (cold-blooded)  
3. Dry scaly skin  
4. Amniote eggs  
5. Respiration with lungs  
6. Ventricle partially divided  
7. Internal fertilization

**The Amniote Egg**

Contains a water and food supply for the developing embryo and can be layed on land.

Must be fertilized \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, has a shell



|  |  |
| --- | --- |
| Structure | Function |
| amnion | provides a watery environment for the embryo |
| yolk Sac | contains the food for the embryo |
| allantois | stores waste |
| chorion | allows oxygen to enter and carbon dioxide to leave |
| albumin | egg white |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - eggs are laid and incubated outside the body   
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - eggs are incubated inside the body, born live  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - live birth, no egg (humans)

**Types of Reptiles**

4 Main Groups (ORDERS)

Crocodilia = crocodiles, alligators

Testudines = turtles and tortoises

Sphenodonta = tuatara

Squamata = lizards, snakes, worm lizards ( largest group )

**1. Order Sphenodonta**

**-** are only found in New Zealand  
- have no external ears  
- have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**2. Order Testudines**

**-** Tortoises and turtles  
- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
- Sea turtles are one of the Earth's most ancient creatures. The seven species that can be found today have been around for 110  million years, since the time of the dinosaurs. They can live up to 50 years or more and have similar life spans to humans. Sea turtles are classified as endangered due mostly to human activity.

- The top of a turtle’s shell is the **carapace**  
- the bottom is the **plastron**

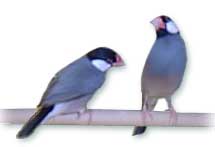
**3. Order Crocodilia**

- alligators and crocodiles  
- Alligators are found mainly in North and South America and only live in freshwater  
- Alligators only show their upper teeth when their mouth is closed, and their snouts are rounder (u-shaped)  
- Crocodiles can live \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, most are found in Africa, India, and Asia  
- Crocs have a pointed snout and show both rows of teeth when their mouths are closed.   
- The Nile Crocodile takes care of its young, a unique trait among reptiles

**4. Order Squamata**

* Snakes and lizards, and worm lizards
* Most diverse group with 7400 living species
* Shed their skin periodically either in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Have jointed jaws that are strong and flexible
* First appeared during the mid Jurassic period (185-165 million years ago)

Birds



## Classification

-Kingdom Animalia  
---Phylum Chordata  
------Subphylum Vertebrata  
---------Class Aves

## Characteristics of Birds

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Feathers
* Hollow, lightweight bones
* Endothermic
* Efficient respiration
* Heart with a completely divided ventricle (4 chambers)
* Scaley feet (birds are related to reptiles)
* furculum (wishbone)

\***Ornithology** is the study of birds

## Feathers

Types of feathers

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - provide insulation  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - cover head and body, provide coloration  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - on wings and tail, provide lift

Feathers are covered in oil to keep them water proof - "like water off a duck's back" - this oil is secreted from a preen gland

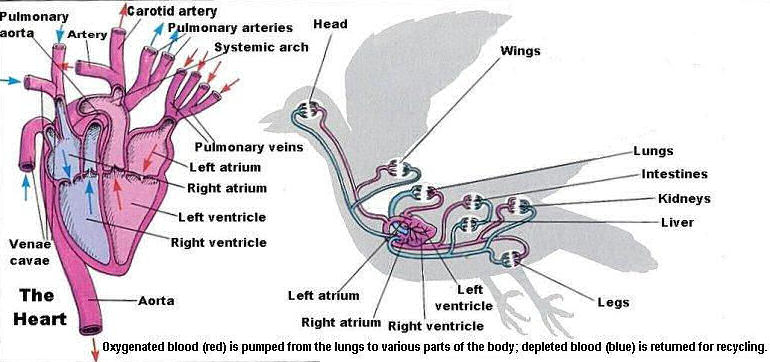
Preening is a behavior that replaces the oil on feathers, and repairs broken links on the vanes

## Avian respiration and circulation

A four chambered heart prevents oxygen rich blood from mixing with oxygen poor blood - it is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

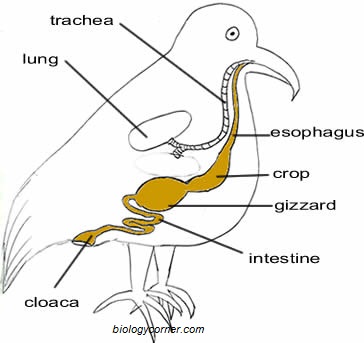
Lungs are connected to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, which fill with air during inhalation. The air then is released from the air sacs when the bird exhales - this means that the bird receives oxygen during inhalation and exhalation

The lungs are connected to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

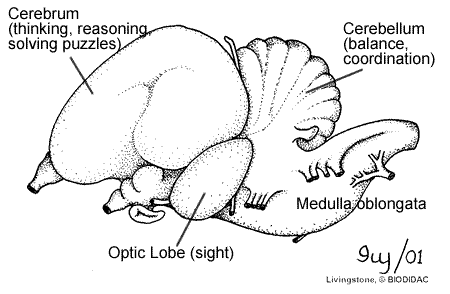


## Bird Digestion

Birds digest food quickly, they can't afford the extra weight.   
They have no teeth, the breakdown of food occurs in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** - sometimes birds swallow rocks to assist this  
The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** stores food...mother birds regurgitate food stored in the crop to their babies  
Waste exits through the cloaca - and so do eggs



## Bird Brain



\* Birds have an excellent sense of sight, but most do not have a good sense of smell

\*Many birds are intelligent and can solve complex puzzles

\*Birds can learn to talk, but really they are just mimicking sounds they hear

## Beaks and Feet

Adapted to the birds way of life. Study of the beak and the feet of a bird gives information about its lifestyle

**Beaks**

Short and thick - seed cracking (robin)  
Long and thin, slightly curved - eating nectar (hummingbird)  
Strong, chisel like - drilling (woodpecker)  
Sharp, curved and pointed - tearing flesh (hawk)  
Long and flattened - straining algae and plants (ducks)  
Spear shaped - spearing fish (heron)

**Feet**

3 toes in front, 1 behind - perching (robin)  
2 toes in front, 2 behind - climbing (parrot)  
Powerful curved talons - grasping prey (hawk)  
Webbed - swimming (duck)  
Long and thin - wading (heron)  
Thick and stout - running (ostrich)

## Bird Classification

Birds are classified by the beaks and their feet. There are many bird orders, but here are some of the more common orders.

Order Passeriformes - songbirds (bluebirds, robins, sparrow)  
Order Falconiformes - birds of prey (hawk, falcon, eagle)  
Order Anseriformes - swimming birds (duck, goose, swan)  
Order Galliformes - fowl (pheasant, turkey)  
Order Ciconiformes - wading birds (heron, flamingo)

\*You will not need to know the orders, but you should know how the birds are grouped. For example, a hawk is more closely related to a falcon than it is to a bluebird.

## Courtship Behavior and Reproduction

Birds often engage in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ behavior for mating purposes. These include:

Building nests  
Dancing and posturing  
Bringing gifts  
Bright colorful displays  
Singing

Some birds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and often both parents raise young.

Two types of reproduction occur in birds:

Some birds incubate eggs for a long time - chicks are born with feathers and can walk/swim (ducks)   
Some birds incubate eggs a short time - chicks are born featherless and helpless (robins)

### Myths about Birds

Birds do not normally have a good sense of smell, except in carrion eaters (vultures) - a baby bird that falls out of a nest can be put back in, the mother probably won't know the difference

Bird poop you find on your car is actually a mixture of urine and solid waste - birds cannot store waste

Some birds can learn to mimic speech, like a parrot - but they can't actually communicate

Eggs bought at the supermarket are not fertilized, you cannot incubate them to hatch a chick.

The term "birdbrain" often describes someone who is stupid - in actuality, some birds are extremely intelligent and can be trained to do tricks and can solve puzzles.

The term "eats like a bird" describes someone who doesn't eat much - in actuality, birds consume a large amount of food to maintain a high metabolism (endothermic)

### Some special terms to describe birds in groups.

A murder of crows  
A gaggle of geese  
A herd of swans  
A cast of hawks  
A brood of chickens  
A murmuration of starlings  
A watch of nightingales  
A host of sparrows  
A bevy of quails