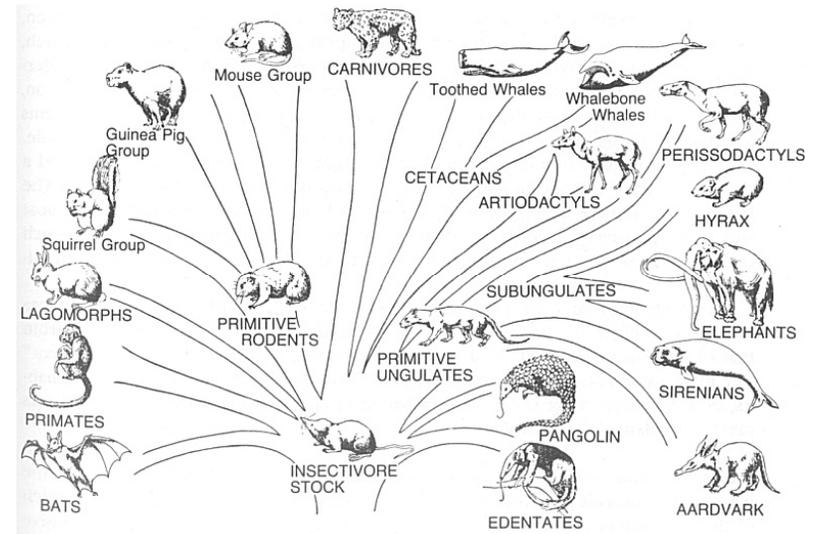
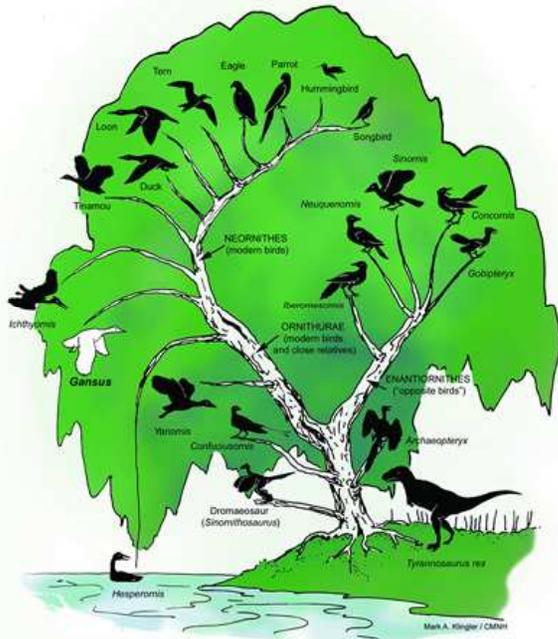


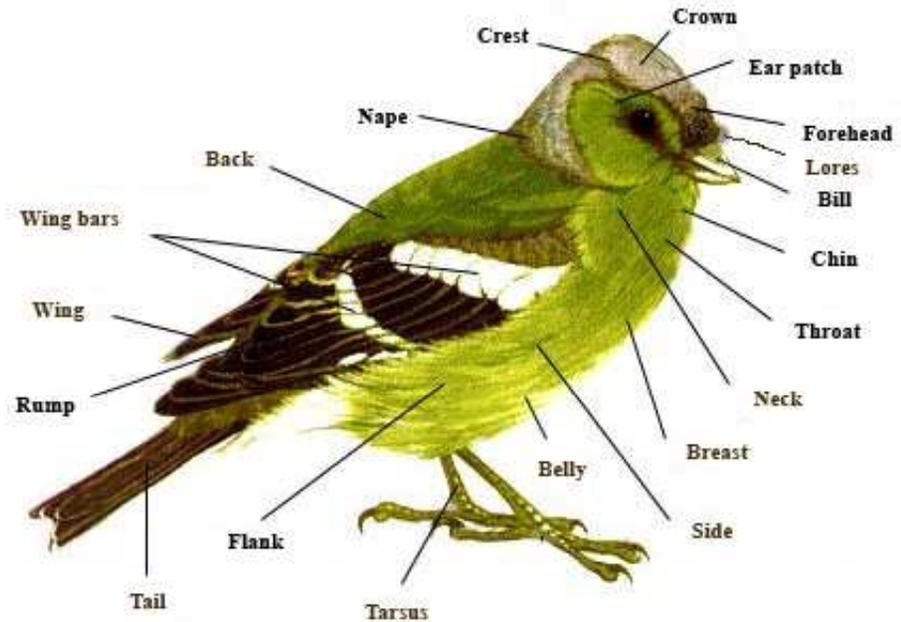
Birds & Mammals



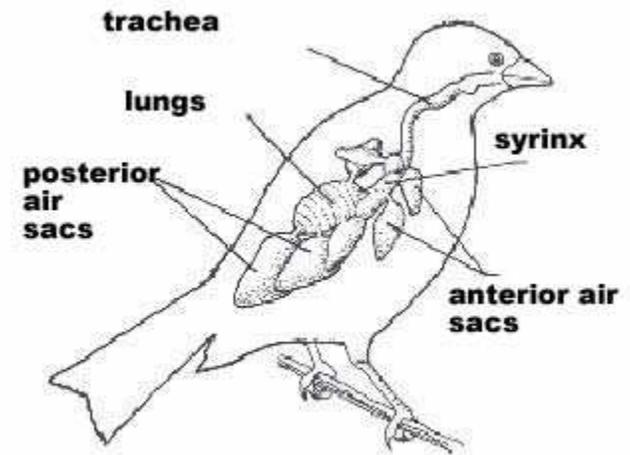
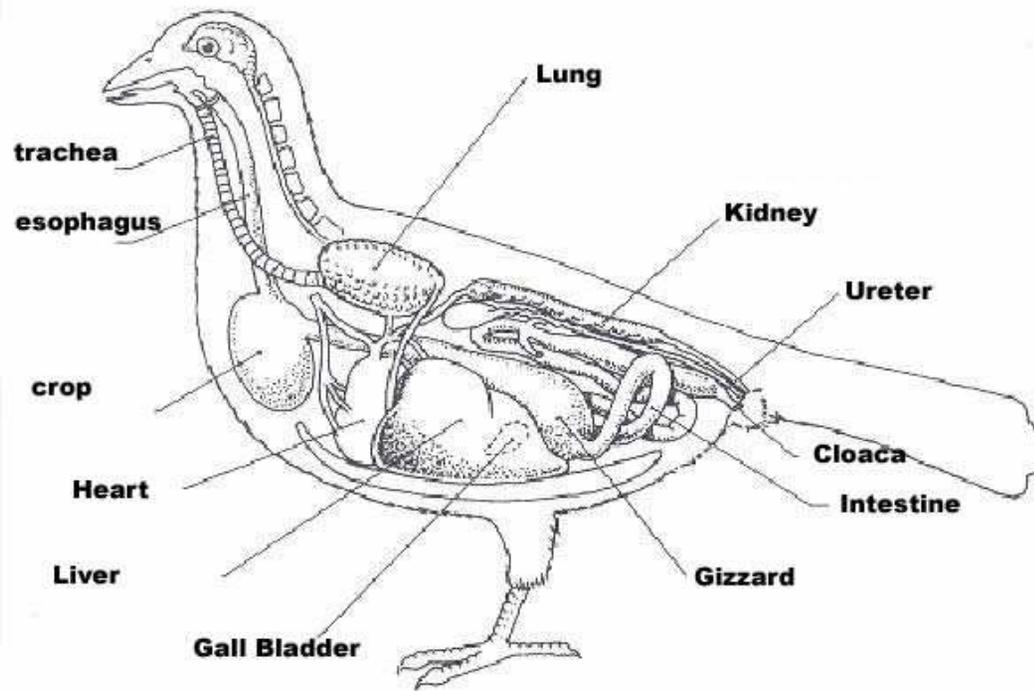
Chapter 15

What is a Bird?

- Vertebrate
- Endothermic
- Feathered
- 4 chambered heart
- Egg laying
- Fore-limbs adapted for flight
- Bones nearly hollow (allow for lighter weight)



Bird Internal Anatomy



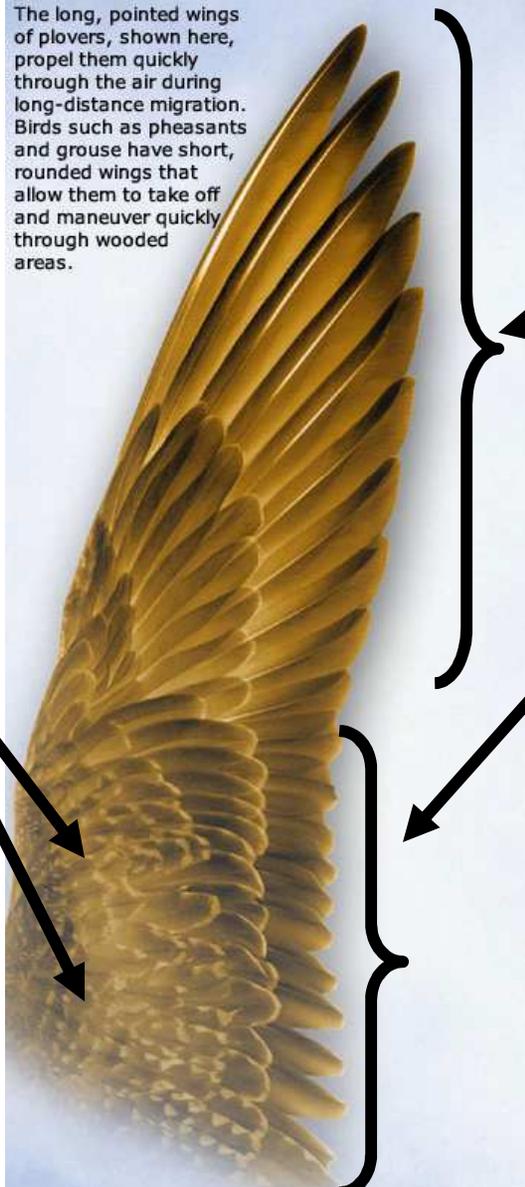
Identify the following:

Trachea	Heart	Lung	Cloaca
Esophagus	Crop	Kidney	Intestine
Gall Bladder	Liver	Ureter	Gizzard

Identify the following:

Trachea
Lungs
Anterior Air Sacs
Posterior Air Sacs
Syrinx

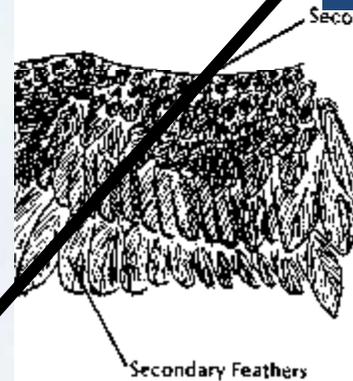
Feather Types



■ Flight Feathers

■ Primary

■ Secondary



Feather Types

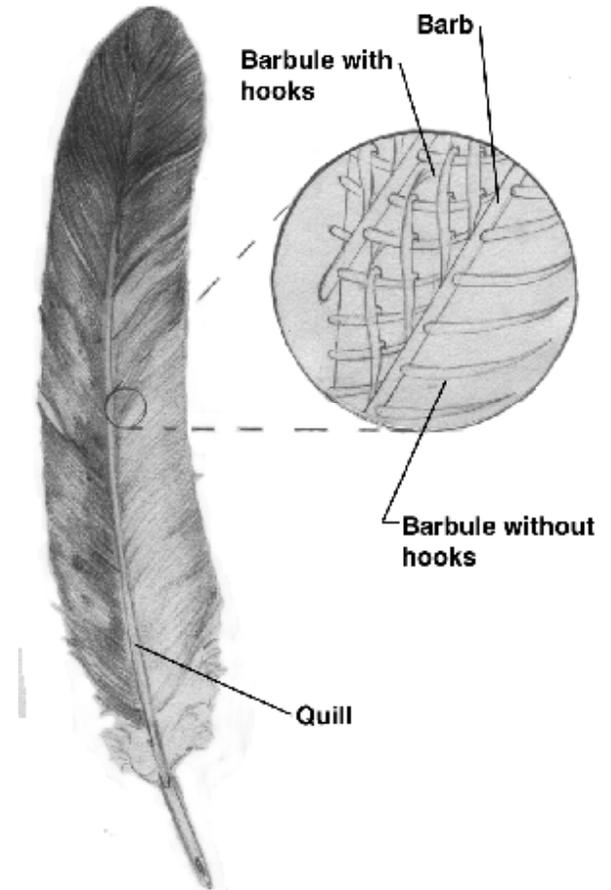
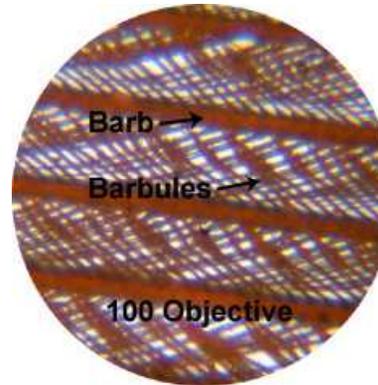


- Contour Feathers
 - Allow for Streamlined Shape
- Down Feathers
 - Allow for warmth
 - & insulation



Anatomy of a Bird Feather

- Main Shaft or Quill
- Barbs branch out from shaft
- Off each barb are
 - One side w/ hooked barbules
 - The outer side w straight barbules w/out hooks
 - Allow for smooth tight cover.



Bird Diversity

Bird beaks: different types of birds' mouths, made up of jaws covered by horny mandibles. They do not contain teeth.

- **Duck:** sieve-like, used for filtering.
Gull: omnivore, has many uses.
Eagle: bird of prey beak for tearing flesh.
Cross bill: bill used to spread cones to get to the seed.
Night hawk: nocturnal bird that catches insects by flying with its large beak open.
Avocet: stirs water & mud lifting invertebrates to catch for food.
Wood pecker: hard sharp beak boring holes in trees, & grabbing grubs.
Parrot: hard bill, cracking seeds.
Flamingo: designed for upside down filtering for aquatic crustaceans.
Kiwi: reaching deep into the mud to grab worms.
Spoon bill: filter water to obtain seeds and invertebrates.
Pelican: beak and

y (fish).

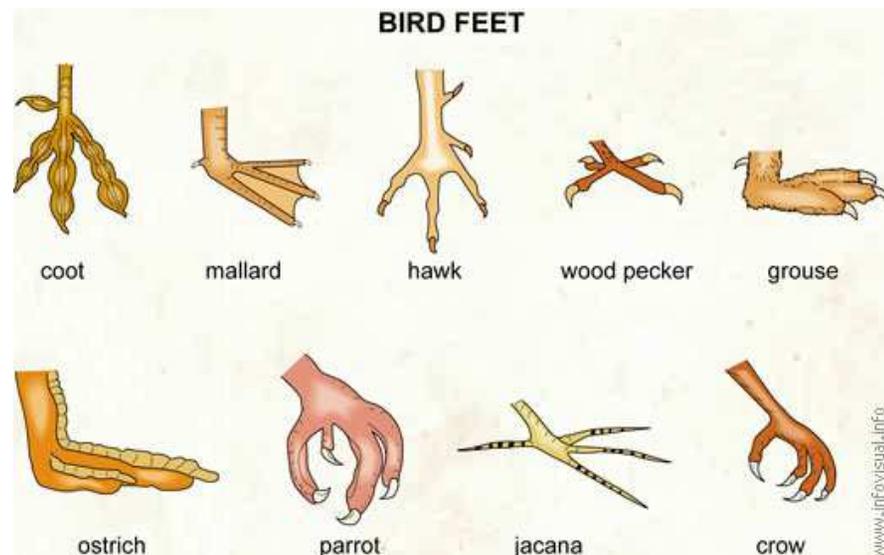


Bird Diversity

Bird feet:

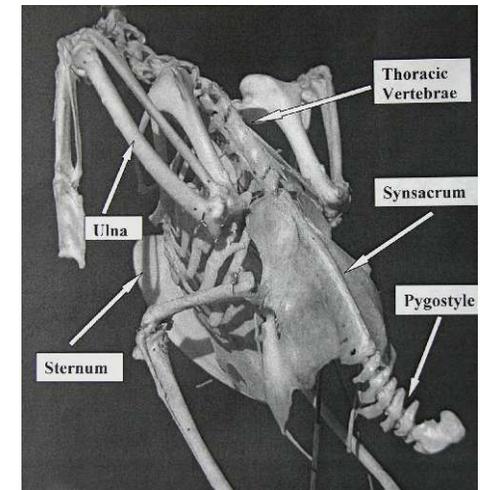
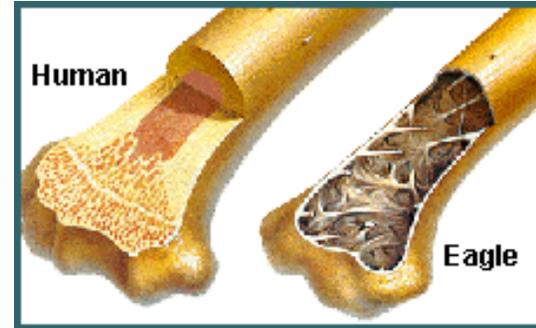
unique structures used to move and support the body.

- **Coot:** wading walk in mud edge of swamps.
Mallard: swimmer.
Hawk: grasping & holding prey.
Wood pecker: climbing bark of trees.
Grouse: generalist, perching, walking, etc..
Ostrich: large support, running.
Parrot: grasp & hold perch, seed & food items.
Jacana: marsh bird – walk in mud (snow shoe type)
Crow: generalist, multiple tasks.



Bird Diversity

- Adaptations for flight
 - Hollow bones allow for light weight
 - Skeleton modified
 - Fused back vertebrae & pelvis
 - Huge sternum for breast muscle attachment
 - 4 chambered heart – efficient transfer of O_2 & CO_2



What is a Mammal?

- Vertebrate
- Endothermic
- Fur or Hair
- 4 chambered heart
- Nurse young w/ Milk
 - Mammary glands
- Teeth modifications
 - Incisors, canines, premolars & molars
- Young born live
 - (except for Monotremes)



Mammalian Diversity

- 3 main groups of mammals:
- Classified by the way their young develop:
 - **Monotremes** – egg layers – Platypus & Echidna
 - **Marsupials** – Pouched mammals - opossums
 - **Placental mammals** – embryo & fetus develop inside the mother until

Egg Laying Mammals

- Order – Monotremata: Duck-Billed Platypus & Echidna
- “Monotreme” – means “one opening”
 - Refers to Avian & Reptilian characteristic of the Cloaca – digestive, reproductive & excretory systems all “dump” into the cloaca.
 - Once eggs hatch, young are nursed w/ milk.



These guys have poisonous spur on their sides



Pouched Mammals

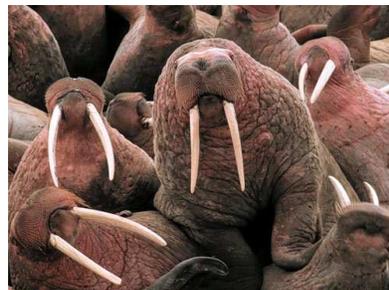
- Order Marsupialia –
 - Kangaroos, Koala, opossums, sugar gliders
 - Bear live young – born @ very early stage of development
 - Grow & mature for 9 months in mother's pouch (kangaroo)
 - New born kangaroo baby (far right) is less than 1" long!!



Placental Mammals

- All other orders of mammals includes:
 - Rodents, shrews, elephants, dogs, cats & whales
 - Placenta – reproductive organ connects embryos w/ mother's uterus.

- Allows exchange of O_2 , CO_2 , nutrients and wastes between mother & offspring
- Allows for longer protected embryonic development – up to two years for elephants!



Placental Mammals

- Longer gestation periods allow for better success at birth
 - Precocial – mature well developed young at birth – ready to run shortly after birth – wildebeest
 - Altricial – young unable to care for themselves – undeveloped, eyes closed etc – puppies



Precocial young



Moments after birth



Altricial young

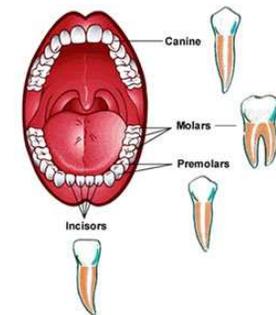
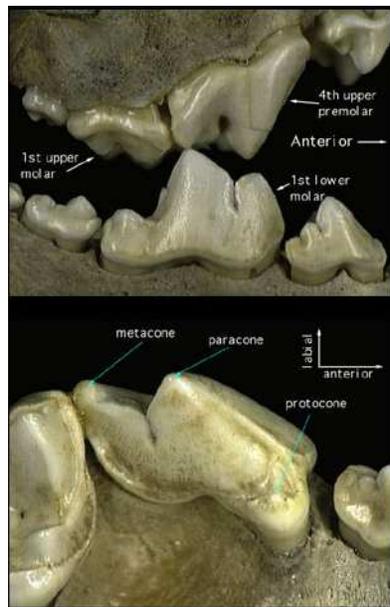
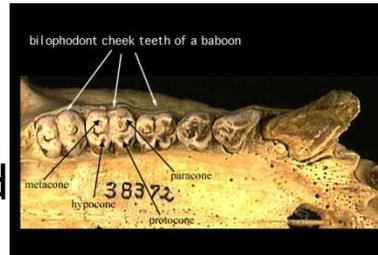
Endless



Africa

Teeth modified – multi functional

- Incisors – used to slice
- Canine – used to tear
- Premolars & molars used to grind
- Carnivores have a pair of carnassial teeth – used for cutting and breaking



The End !!