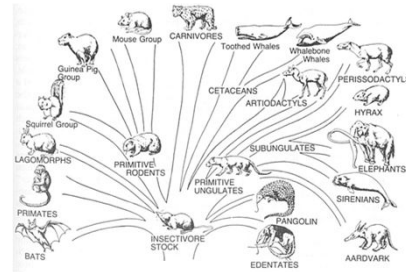
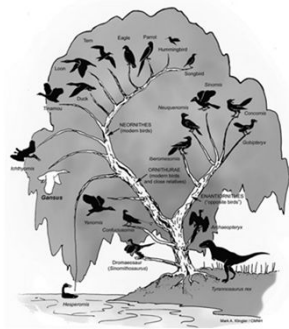


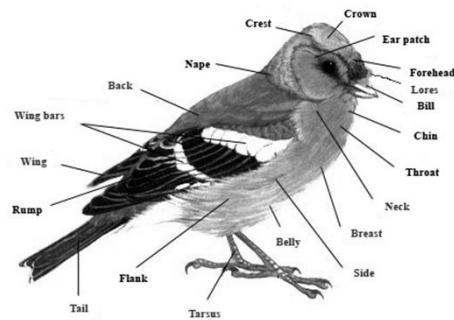
# Birds & Mammals



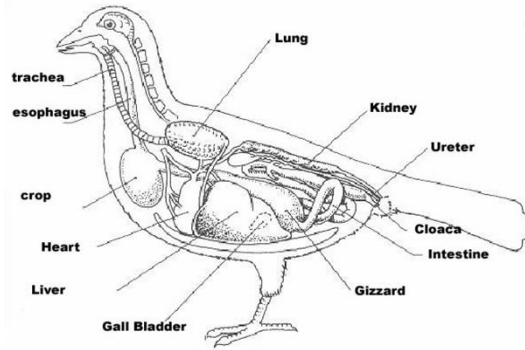
## Chapter 15

### What is a Bird?

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

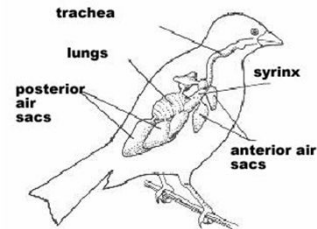


## Bird Internal Anatomy



### Identify the following:

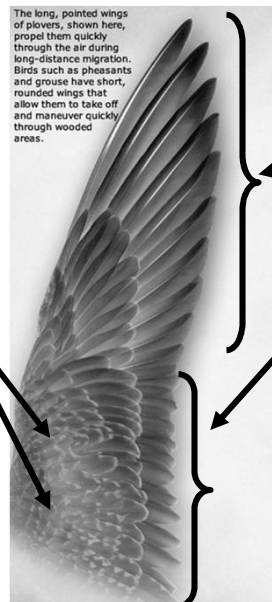
Trachea	Heart	Lung	Cloaca
Esophagus	Crop	Kidney	Intestine
Gall Bladder	Liver	Ureter	Gizzard



### Identify the following:

Trachea  
Lungs  
Anterior Air Sacs  
Posterior Air Sacs  
Syrinx

## Feather Types



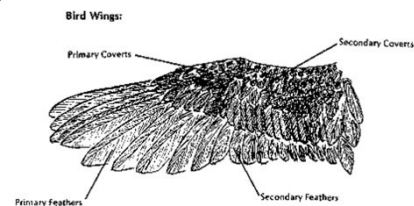
### ■ Flight Feathers

#### ■ Primary

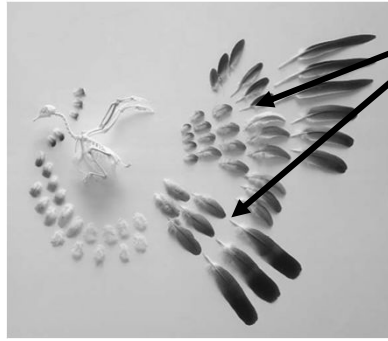
#### ■ Secondary

Wing  
Coverts

(A type of  
contour  
feather)



## Feather Types

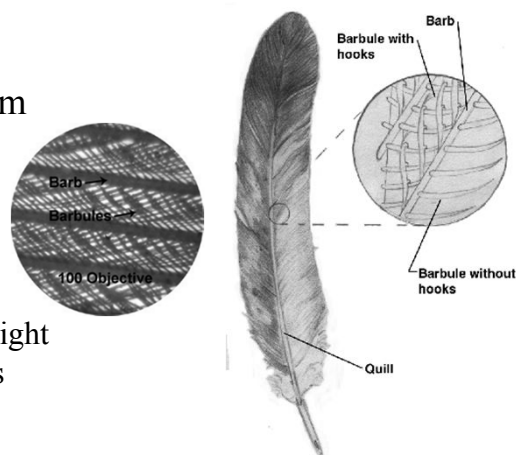


- Contour Feathers
  - Allow for Streamlined Shape
- Down Feathers
  - Allow for warmth & insulation



## Anatomy of a Bird Feather

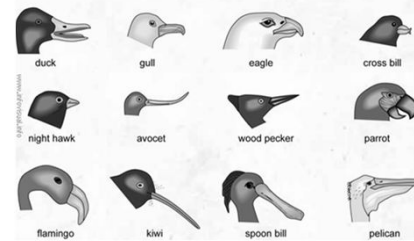
- Main Shaft or Quill
- Barbs branch out from shaft
- Off each barb are
  - One side w/ hooked barbules
  - The outer side w straight barbules w/out hooks
  - Allow for smooth tight cover.



## 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 pouch used like a fishing net to scoop up prey (fish).

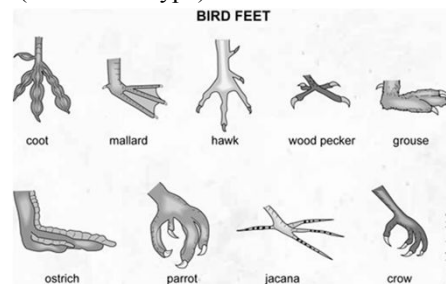


## Bird Diversity

**Bird feet:**

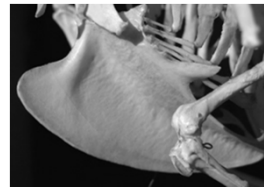
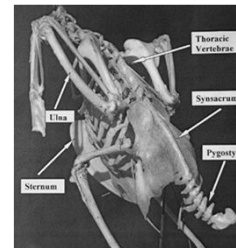
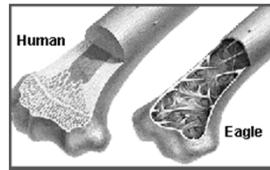
unique structures used to move and support the body.

- **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

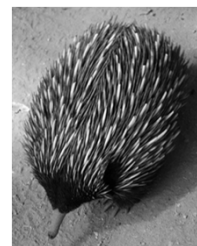
- 3 main groups of mammals:
- Classified by the way their young develop:
  - Monotremes – egg layers – Platypus & Echidna
  - Marsupials – Pouched mammals - opossums
  - Placental mammals – embryo & fetus develop inside the mother until

## 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.

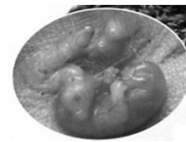


These guys have poisonous spur on their sides



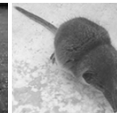
## Pouched Mammals

- 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 or feed themselves at birth, undeveloped, eyes closed etc. – puppy dogs



Precocial young



Moments after birth

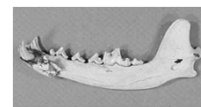
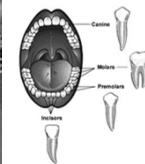
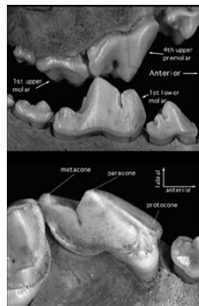


Altricial young



## 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 !!**