

# Lecture 19: Animal Classification

## Class Reptilia

Adaptations for life on land

- Amniotic egg. بيض جنيني
- Water-tight scales.
- One **occipital condyle** – one point of attachment of the skull with the vertebral column.
- Water-conserving kidney.
- Three-chambered heart
  - Crocodilians التماسيح have 4
- Claws for digging and locomotion.
- Improved Respiratory System.
- Loss of Lateral Line System of fish and amphibians.
- 17 orders of reptiles, but only members of 4 remain alive today.



# Order Testudines السلحفاة

- 300 species of turtles (الترسة) البحرية السلاحف and tortoises السلاحف البرية
- Bony shell
- Limbs articulate internally to the ribs ضلوع
- Keratinized beak منقار instead of teeth
- Fusion of vertebrae, ribs and skin bones form plates – **carapace** (top of the shell).
- Bones of the pectoral girdle الحزام الصدري and skin bones form – **plastron** (bottom of the shell).



# Order Crocodylia التماسيح

- 21 living species; crocodiles, alligators, the American crocodile, caiman, and gavials.
- Anatomically closer to birds and dinosaurs than other reptiles (have 4-chambered heart, triangular eye orbits, other skull characteristics).
- Almost unchanged in 170 million years.



**Brown Caiman**



**Saltwater Croc.**



**American Alligator**



**Gavial or Gharial**



# Order Squamata

Diverged 150 million years ago from lepidosaurs

- Suborder Sauria – Lizards
- Suborder Serpentes – Snakes
- Suborder Amphisbaenia – Worm Lizards



Coral Snake



Chameleon الحرباء



Worm Lizard السحلية

# Suborder Sauria – the Lizards

- 4, 500 species of lizards; *sauro*, lizards
- Usually have two pairs of legs
- Upper and lower jaws unite anteriorly.
- Most are oviparous, some are ovoviviparous or viviparous
- Herbivorous, omnivorous, and carnivorous.
- Live in a variety of habitats.



Blue-tongue Skink



Frilled Lizard



Agama Lizard



Argus  
Monitor



# Suborder Serpentes- The Snakes

- About 2,900 species, *serpere*, to crawl
- Most are **harmless**, but about 300 species are venomous.
- Elongate and lack limbs, have more than 200 vertebrae and pairs of ribs – for locomotion.
- Upper jaws are movable on the skull and upper and lower jaws loosely joined by flexible ligaments, so each half can move independently – allows swallowing large prey.
- All are carnivorous.



# Class Aves

- Major Characteristics
  - Adaptations for Flight
    - Appendages modified as wings
  - Feathers
  - Endothermy داخلية الحرارة
  - High Metabolic Rate
  - A Vertebral Column modified for flight
  - Bones lightened by numerous air spaces
  - Modern Birds:
    - Possess a horny bill and lack teeth

- Order Sphenisciformes – Penguins البطريق
  - Heavy bodied, flightless flipper زعنفة like wings for swimming, with insulated with fat



Emperor Penguins

- Order Strigiformes – Owls
  - Large head with eyes fixed forward; raptorial foot



Barn owl.



- Order Anseriforms – Ducks, Geese and Swans البجع
  - Wide flat bill and an undercoat of dense down; webbed feet.



Female Mallard Duck

- Order Columbiformes – Pigeons and Doves
  - Dense Feathers loosely set in skin, well developed crop

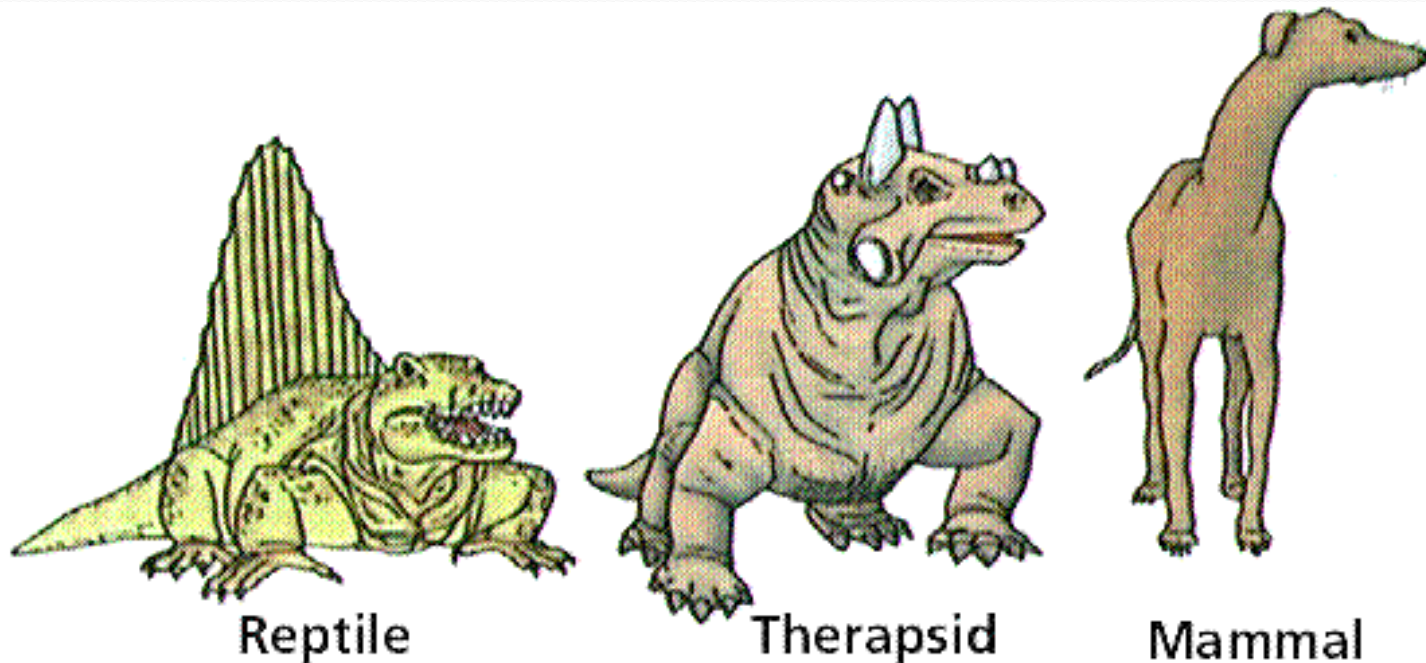


Decorative Dove

# Mammals

## Major Concept:

1. Mammalian characteristics evolved gradually over a 200-million-year period in the synapsid lineage.



2. The skin of mammals is thick and protective and has an insulation covering of hair.





3. Adaptations of teeth and digestive tract allows mammals to exploit a wide variety of food resources.



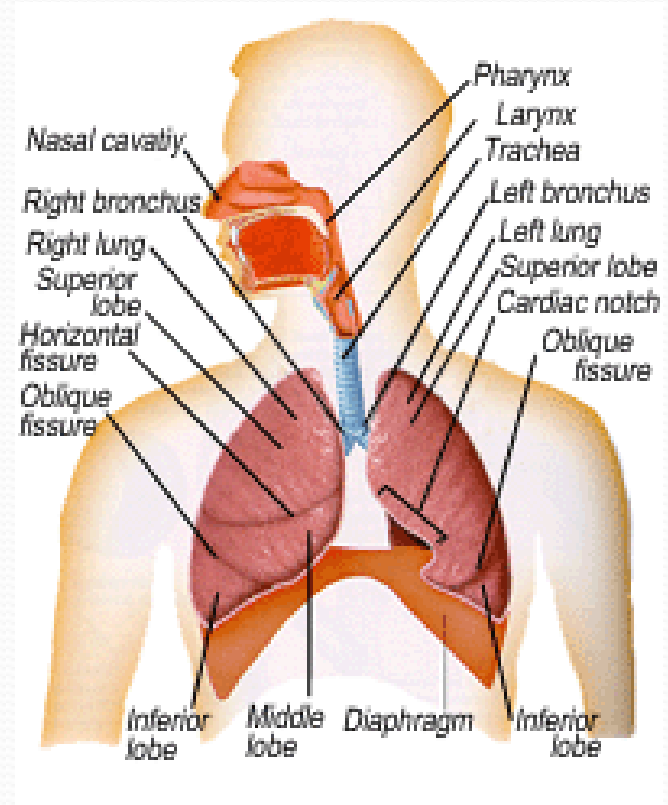
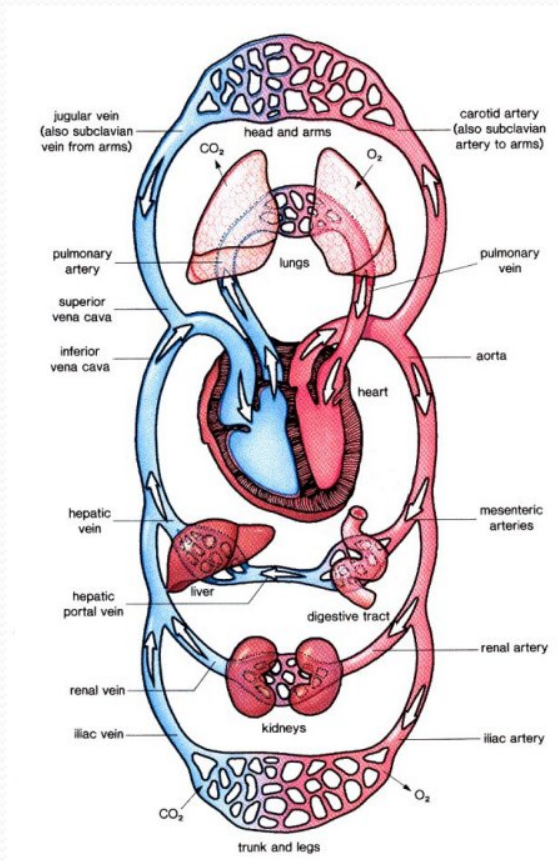
Beaver Teeth

Siberian Brown  
Bear - Teeth

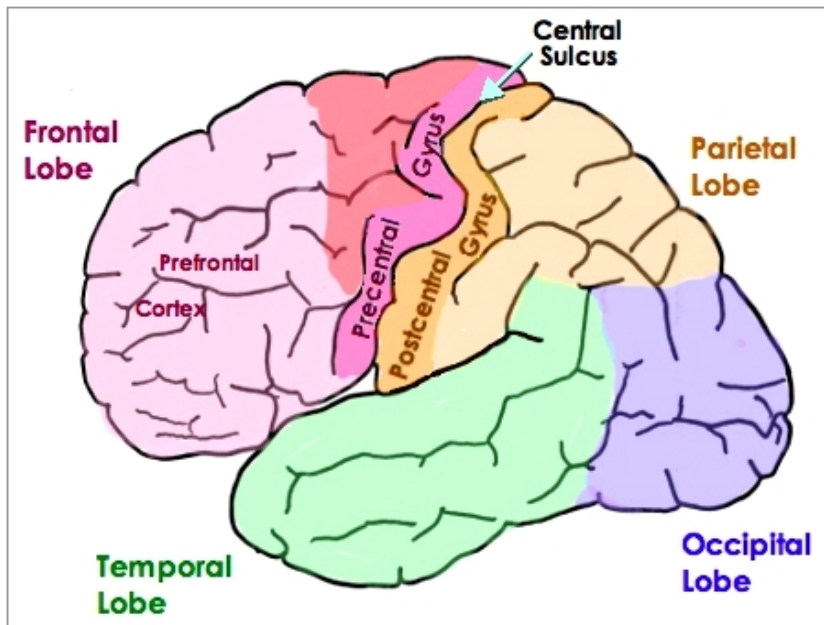


Orca teeth

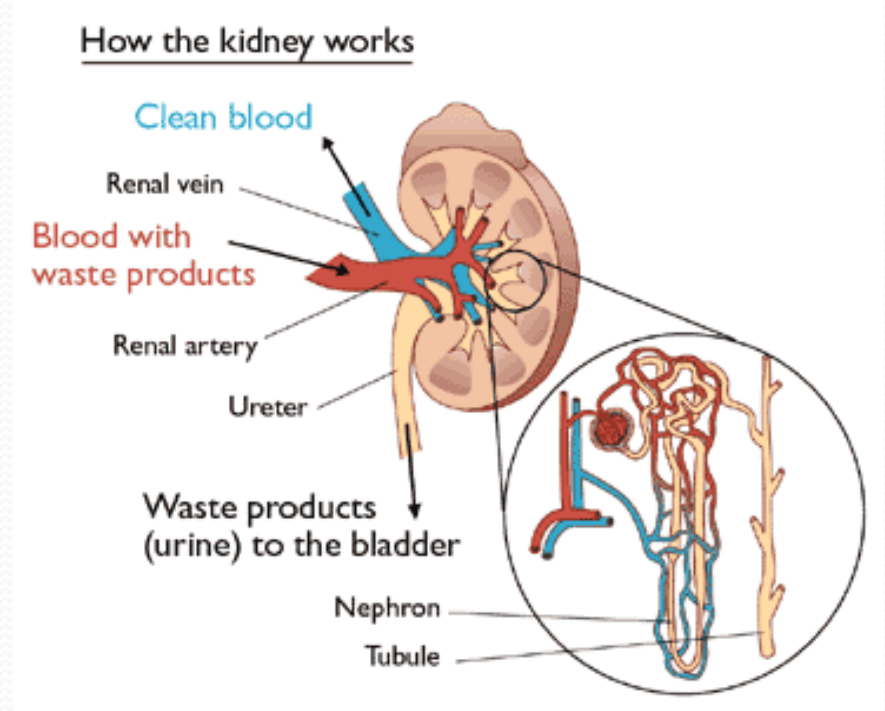
#### 4. Efficient systems for circulation and gas exchange support the high metabolic rate associated with mammalian endothermy.



5. The brain of mammals has an expanded cerebral cortex that processes information from various sensory structures.



6. Metanephric kidneys permit mammals to excrete urea without excessive water loss.





7. Complex behavior patterns enhance mammalian survival.



8. Most mammals are viviparous and have reproductive cycles that help ensure internal fertilization and successful development.

