

# Vertebrates

# Chordata

- Characteristics:
  - Bilaterally symmetrical
  - 3 germ layers
  - Digestive tract with two openings
- Structures:
  - Notochord
  - Dorsal nerve cord, pharyngeal slits, tail at some stage of life
  - Closed circulatory system

# Class Agnatha

- Examples: Hagfish, lamprey
- Characteristics:
  - Ectotherm
  - Oldest known vertebrates
  - Cartilaginous skeleton
  - Lack jaws
  - Unpaired fins
  - Can't bite (burrow through body)
- Structures:
  - Elongated, eel-like body
  - Scale-less fish



# Class Chondrichthyes

- Cartilaginous fish
- Examples: Shark, ray, skate
- Characteristics:
  - Ectotherm
  - Predatory fish
  - Have jaws
  - Paired fins
  - Skin covered with placoid scales
  - Most live in salt water
  - Keen vision
- Structures:
  - Sharks have the largest brain of any fish



# Class Osteichthyes

- Bony fish
- Examples: Salmon, bass, catfish
- Characteristics:
  - Ectotherm
  - Bony skeleton
  - Have jaws
  - Paired fins
  - Lay large number of eggs
- Structures:
  - Have scales
  - Most have a swim bladder





# Class Amphibia

- Examples: Frogs, toads, salamanders
- Characteristics:
  - Ectotherm
  - Name means double life
  - First vertebrates to live on land
  - Moist, thin skin
  - Lay eggs in the water
- Structures:
  - Lacks scales
  - Three-chambered heart
  - No claws



# Class Reptilia

- Examples: Dinosaurs, turtles, snakes
- Characteristics:
  - Ectotherm
  - First fully terrestrial vertebrate
  - Evolved from amphibians
  - Thick, dry, scaly skin that prevents water loss
- Structures:
  - Three-chambered heart (except crocodiles)
  - Scales made of keratin
  - Amniotic egg (prevent water loss since young born on land)



# Reptilia



TheRoughWoodsmen.com



# Class Aves

- Examples: Birds
- Characteristics:
  - Endotherm
  - Can fly (feathers, hollow bones, wings)
  - Respiratory system (lungs with air sacs)
  - Evolved from dinosaurs
- Structures:
  - Beaks, no teeth
  - Four-chambered heart
  - 2 part stomach



# Class Mammalia

- Examples: Mammals (Humans, cats, horses, dogs, manatees)
- Characteristics:
  - Endotherm
  - Have hair and mammary glands (produce milk)
  - Single jawbone and specialized teeth
- Structures:
  - Four chambered heart

