



# **VERTEBRATES**



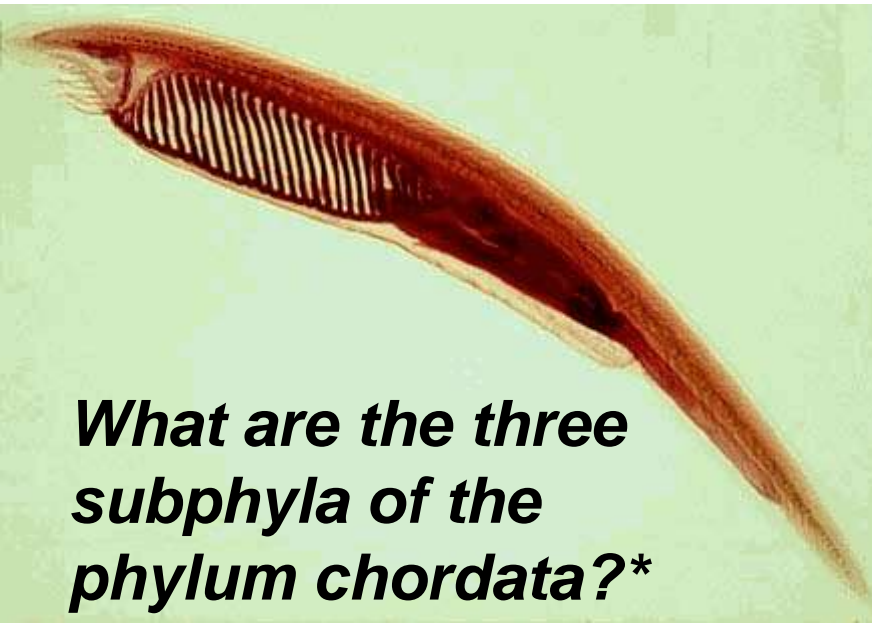
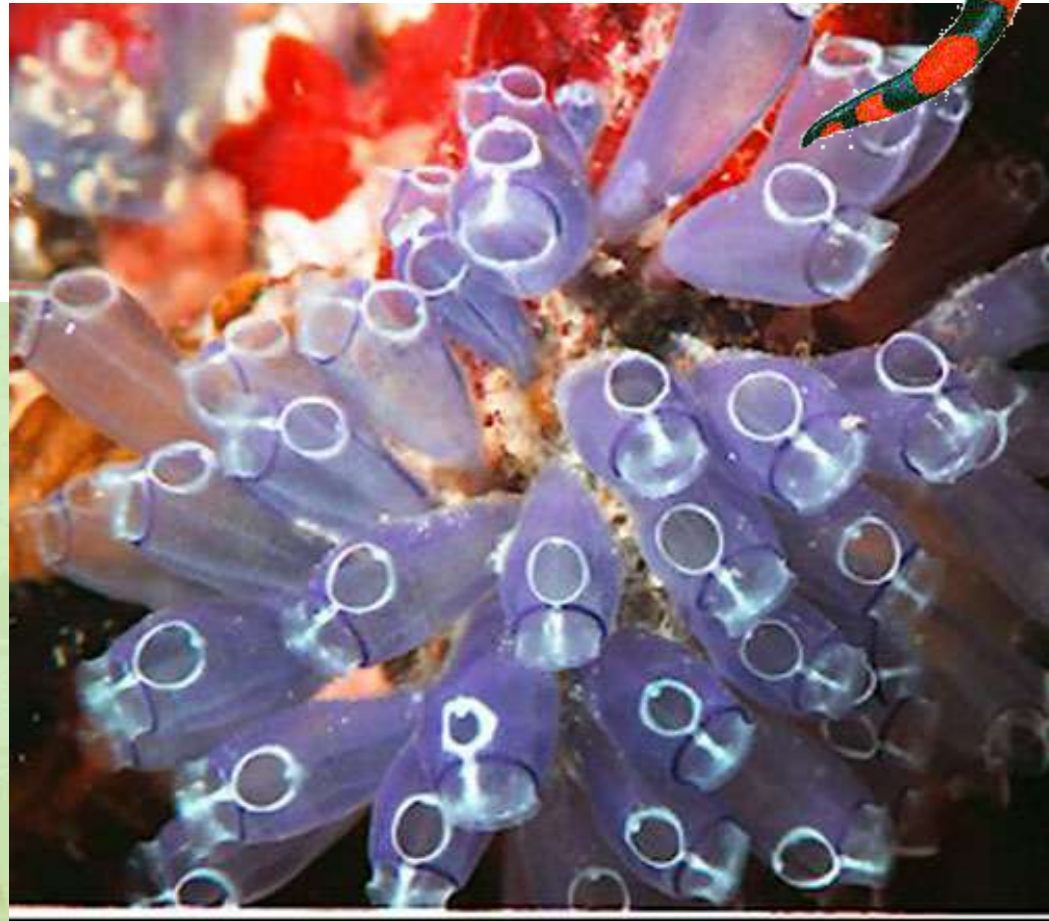
**Life Science Chapter 14**

**Animals with backbones**

# Chordates

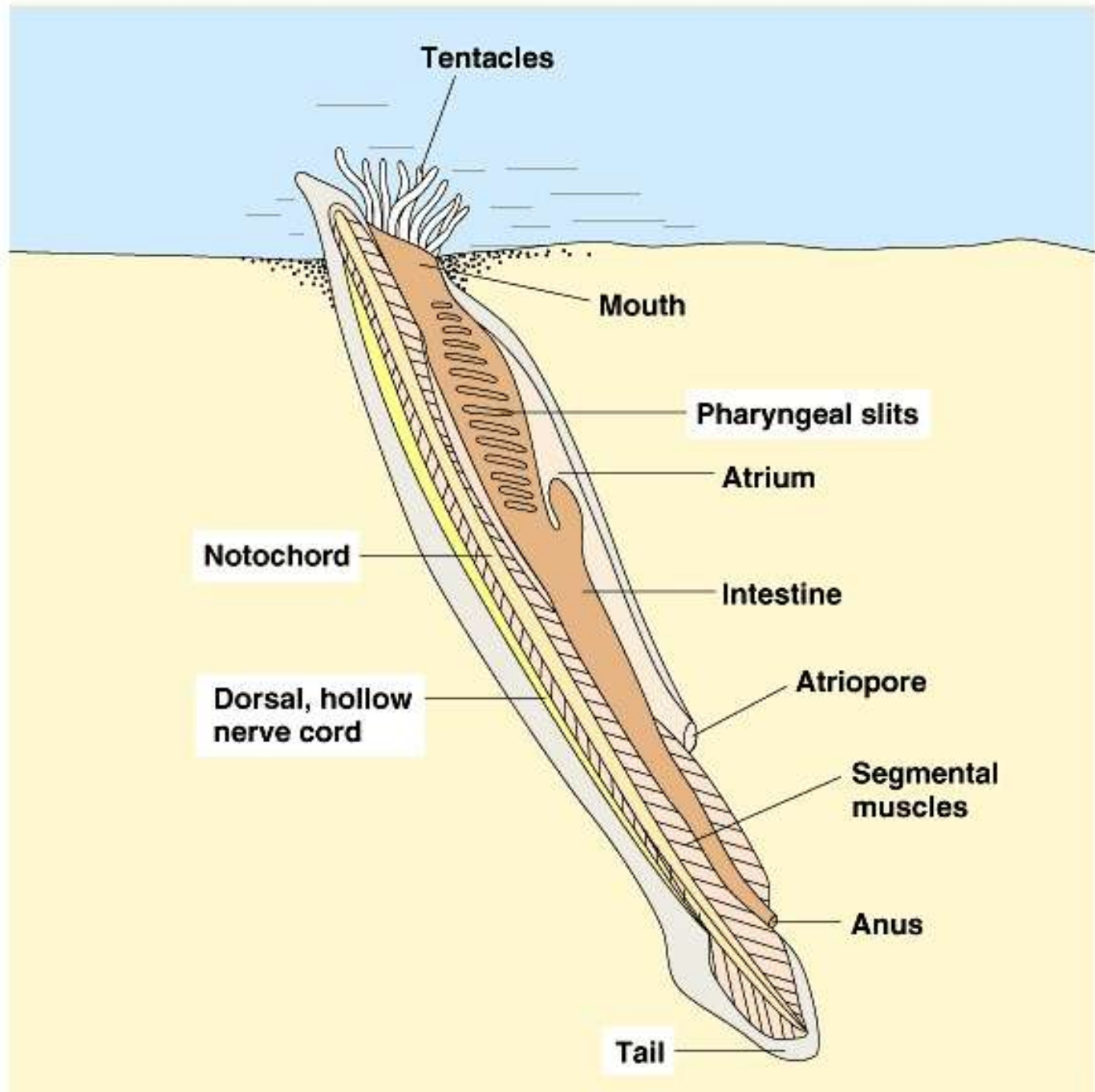


- **Phylum Chordata**
- **Three subphyla**
  - **Vertebrates**
  - **Tunicates**
  - **Lancelets**



*What are the three subphyla of the phylum chordata?\**



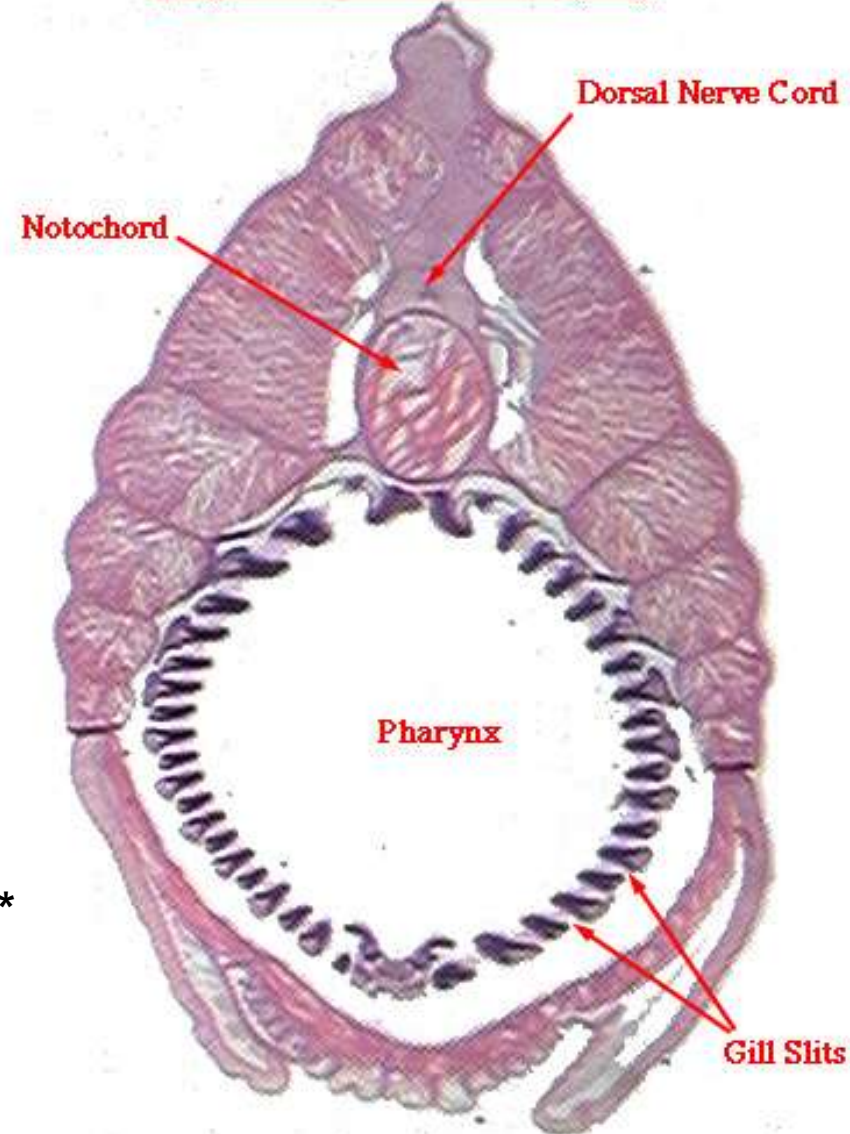


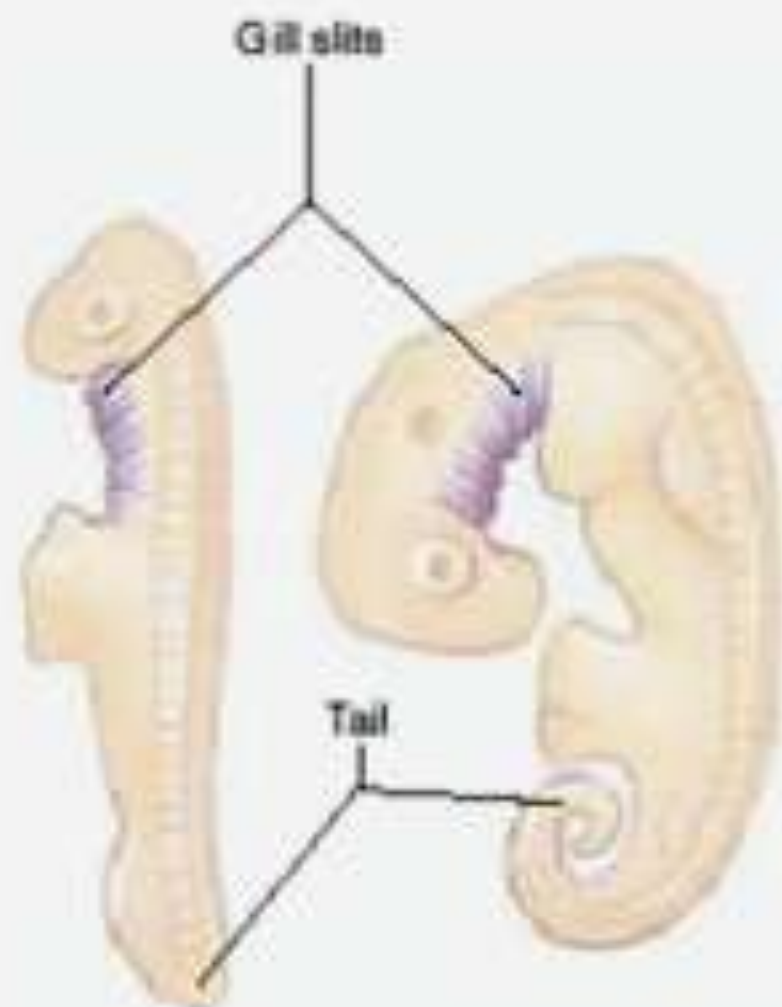
# Three characteristics of chordates

- Notochord (develops into a backbone in vertebrates)
- Dorsal hollow nerve cord (develops into a spinal cord in vertebrates)
- Pharyngeal pouches (gill slits)

*Name three characteristics of a chordate.\**

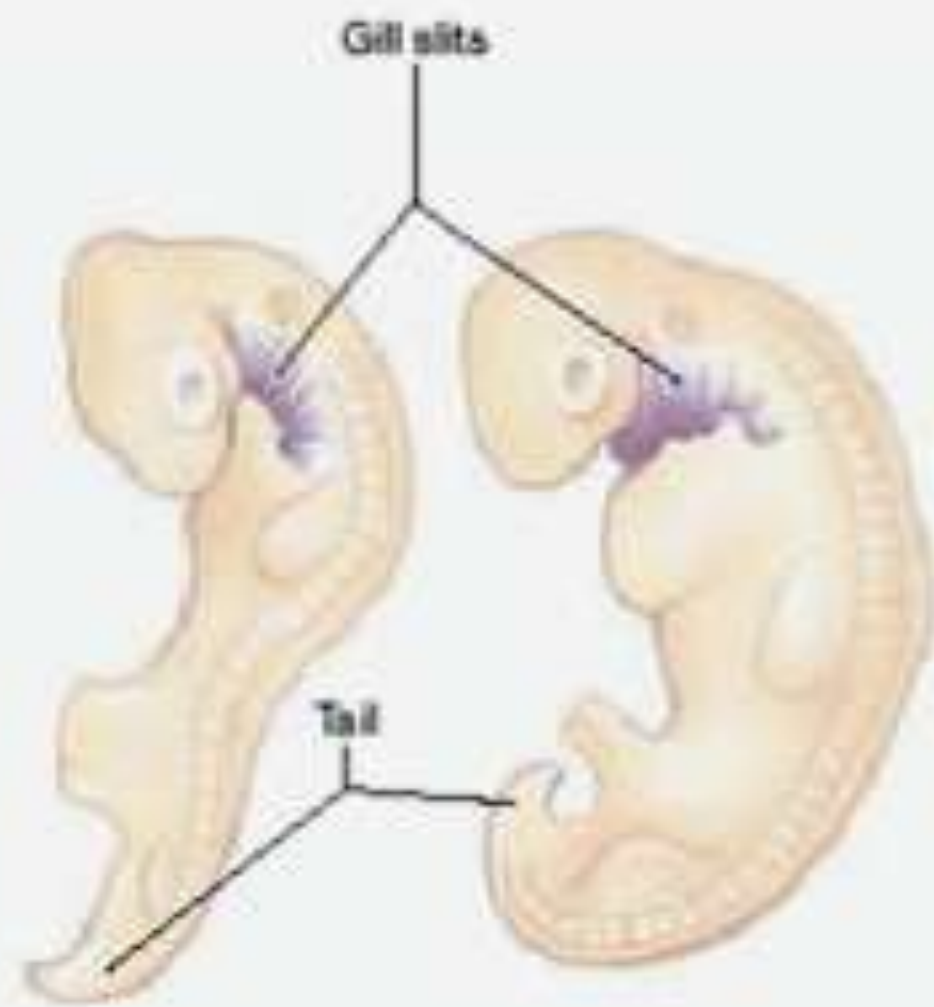
Amphioxus Cross Section (X10)





Fish

Reptile



Bird

Human

# Vertebrates

## Ectotherm



- Two main groups
  - Ectotherms – Get heat from outside
  - Endotherms – Have a constant internal body temperature

*Name the two main divisions of vertebrates.\**



## Endotherm



# Fish

- **Characteristics**
  - Ectotherms
  - gills,
  - fins,
  - external fertilization,
  - 2 Chambered heart,
  - scales

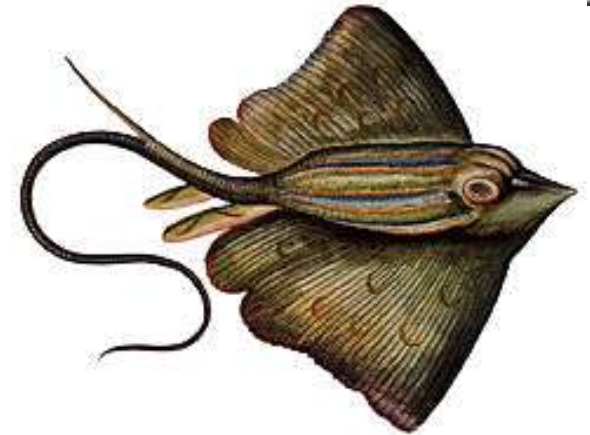
*Name some characteristics of fish.\**





# C. Three classes of fish

- **Agnatha – Jawless fish, examples are lamprey and hagfish**
- **Chondrichthyes – Cartilage fish, examples are shark, rays and skates**
- **Osteichthyes – bony fish (largest class of fish)**

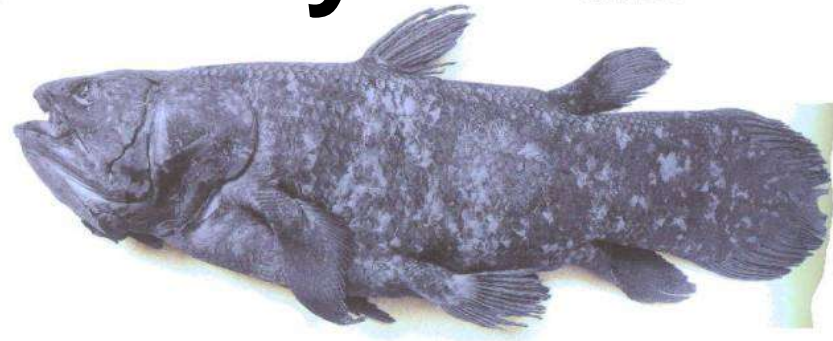


*What are the three classes of fish and what are their distinguishing characteristics?\**

*To what class do 95% of the fish belong?\**

# Three groups of bony fish

- Lobe finned fish
- Lung fish (have both gills and lungs)
- Ray finned fish



What are the three main groups of osteichthyes?



*Is it real? Or is it resin?*



# Amphibians



- **(Means double life)**
- **Characteristics**
  - **Moist skin without scales**
  - **Exchange gases through skin or simple sac-like lungs**
  - **Skeleton made of bone**
  - **Three chambered heart**
  - **Lay eggs in water**
  - **Go through metamorphosis**
  - **Ectotherms**
- **Hibernate**
- **Estivate – Slow their system during a dry hot period**

*What does the word amphibia mean?\**

*Describe metamorphosis in a frog.\**

# Amphibians

- Includes, Frogs, toads, salamanders, and newts
- External fertilization
- Amphibians on the decline p. 414



*Give three characteristics of amphibians.\**



*A. t. tigrinum*

Photo by David Snyder



larvae Tiger Salamander









***What is a possible reason for the recent decline in amphibians?\****



**Gina Mikel**  
**[www.scientificillustrator.com](http://www.scientificillustrator.com)**



# Quiz

1. What are the three subphyla of chordata?
  - 1.
  - 2.
  - 3.
2. What three characteristics of Chordates?
  - 1.
  - 2.
  - 3.
3. Vertebrates are classified into two groups based on how they get there heat. What are the two groups?
  - 1.
  - 2.
4. Give three characteristics of fish.
  - 1.
  - 2.
  - 3.
5. Give three characteristics of amphibians.
  - 1.
  - 2.
  - 3.

# Reptiles

- **Characteristics**
  - **Ectotherms**
  - **Scales**
  - **Breathe through lungs**
  - **Three chambered heart**
  - **Internal fertilization**
  - **Lay eggs on land that have a leathery shell**

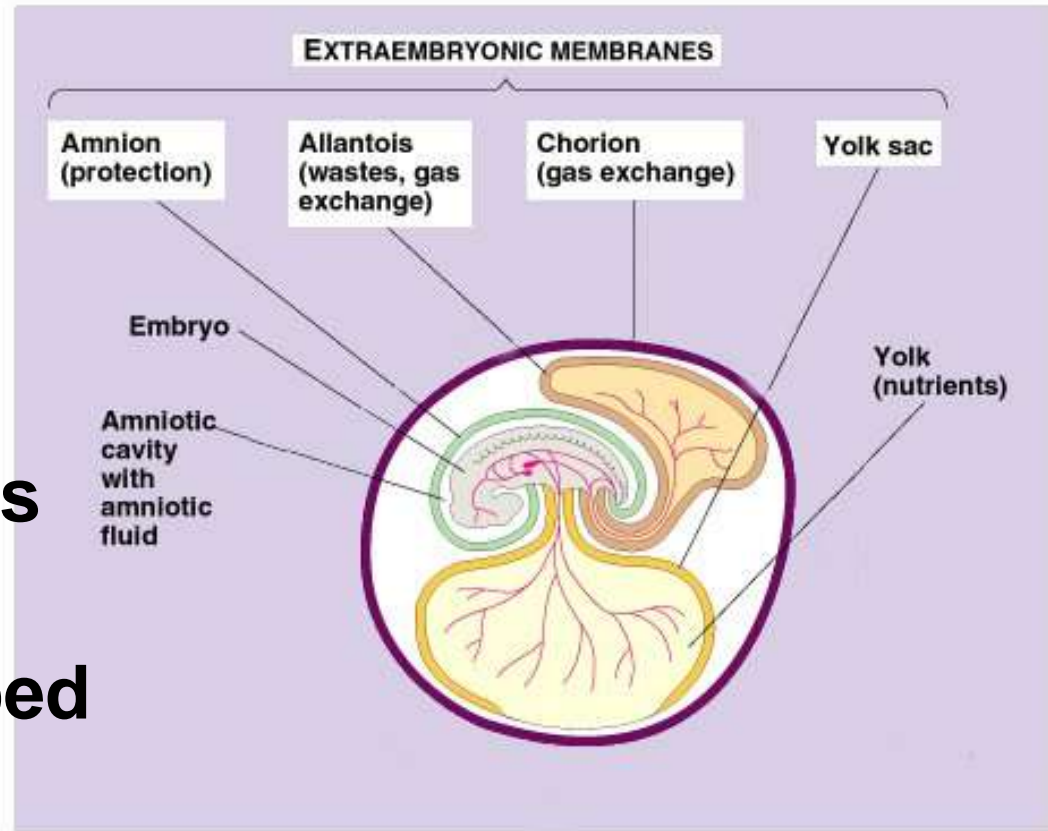


*Give three characteristics of reptiles.\**

*Describe how reptiles reproduction allows them to live on land and amphibians do not.\**

# Amniotic egg

- Membranes form cushion and protection
- Large food supply (yolk)
- Pores that allow gas exchange
- Hatch fully developed



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*How is the amniotic egg beneficial to the life on land.\**

*How many chambered heart does a reptile and amphibian have?\**

# Reptiles

- Group includes: Lizards, snakes, turtles, crocodiles, alligators, and dinosaurs
- Three orders of reptiles exist today
  - Turtles: Hard shelled
  - Crocodiles and alligators (Crocodilia)
    - Alligators have U shaped jaw that covers lower teeth.
    - Crocodiles have a more pointed jaw that doesn't cover all of their lower teeth.
  - Lizards and Snakes – Largest group of reptiles
    - Lizards
      - Movable eyelids
      - External ears,
      - Usually legs with toes claws and feet
    - Snakes –
      - No legs
      - No eyelids

**What are the three order of reptiles, and what is a characteristic of each?**













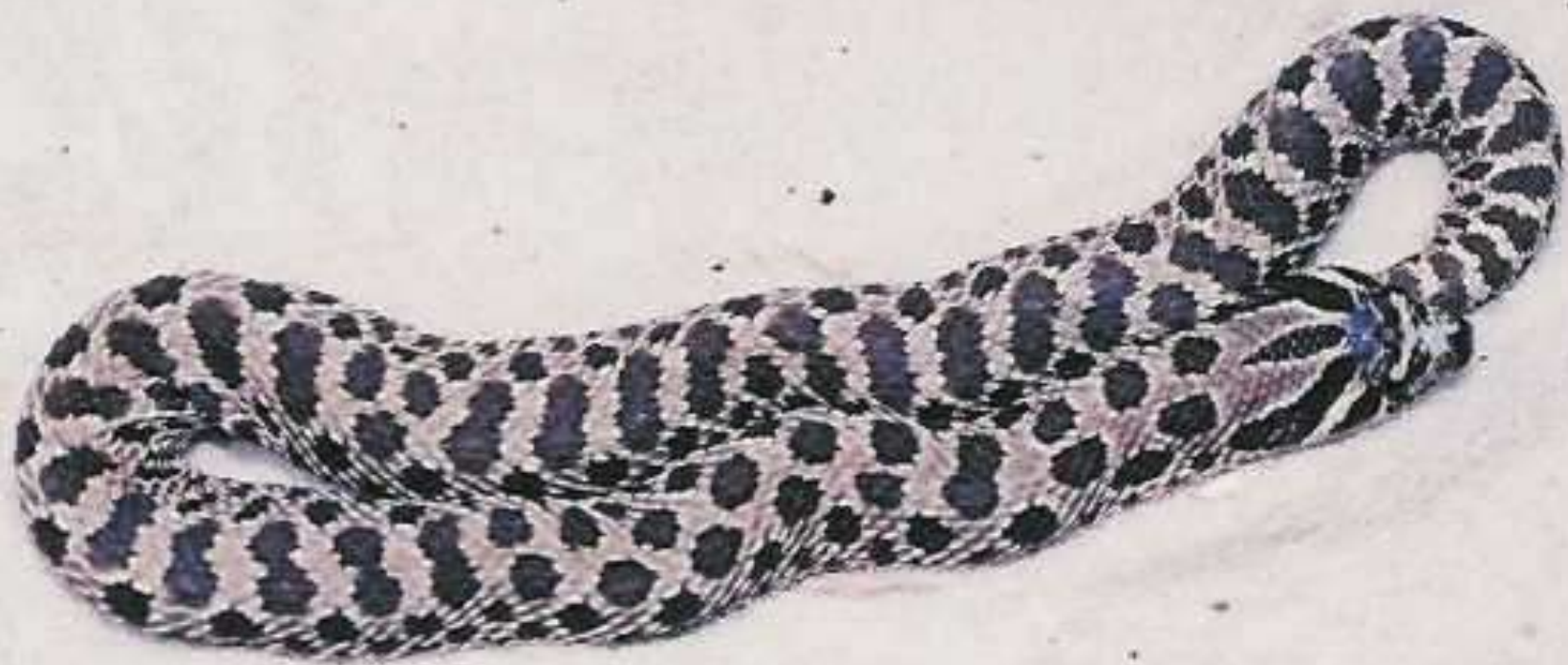




Photo by: Jerry L. Gingerich



Rat Snake

# Quiz

1. What are the three classes of fish?
  - 1.
  - 2.
  - 3.
2. What are the three groups of bony fish?
  - 1.
  - 2.
  - 3.
3. What does amphibia mean?
4. What are three characteristics of the class reptilia?
  - 1.
  - 2.
  - 3.
5. What are the three orders of reptiles?
  - 1.
  - 2.
  - 3.