

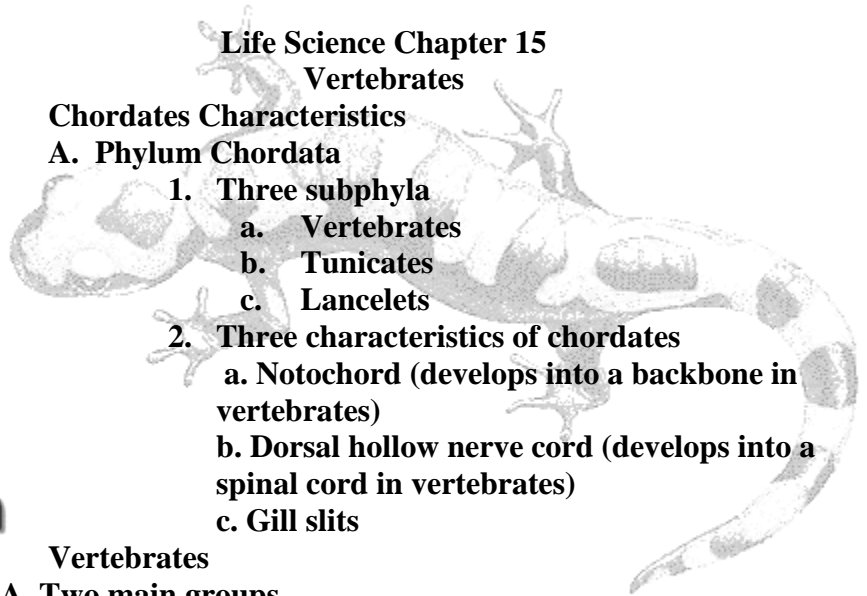
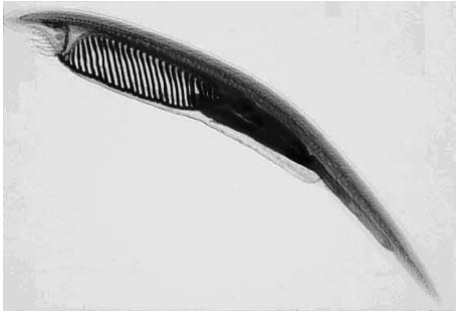
Life Science Chapter 15

Vertebrates

I. Chordates Characteristics

A. Phylum Chordata

1. Three subphyla
 - a. Vertebrates
 - b. Tunicates
 - c. Lancelets
2. Three characteristics of chordates
 - a. Notochord (develops into a backbone in vertebrates)
 - b. Dorsal hollow nerve cord (develops into a spinal cord in vertebrates)
 - c. Gill slits



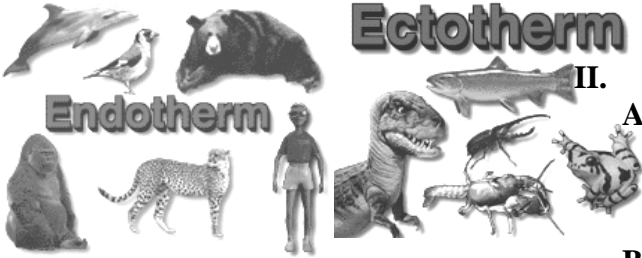
Ectotherm

II. Vertebrates

A. Two main groups

1. Ectotherms – Get heat from outside
2. Endotherms – Have a constant internal body temperature

Endotherm

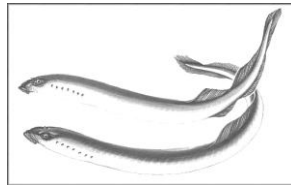
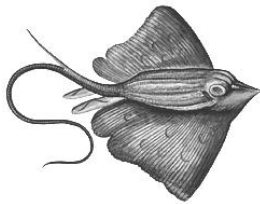


B. Fish

1. All have gills, fins, external fertilization, Chambered heart, and scales

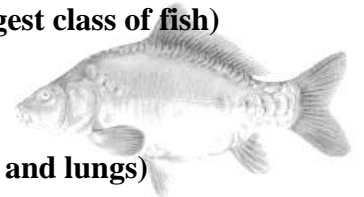
C. Three classes of fish

1. Agnatha – Jawless fish, examples are lamprey and hagfish
2. Chondrichthyes – Cartilage fish, examples are shark, rays and skates
3. Osteichthyes – bony fish (largest class of fish)



a. Three groups of bony fish

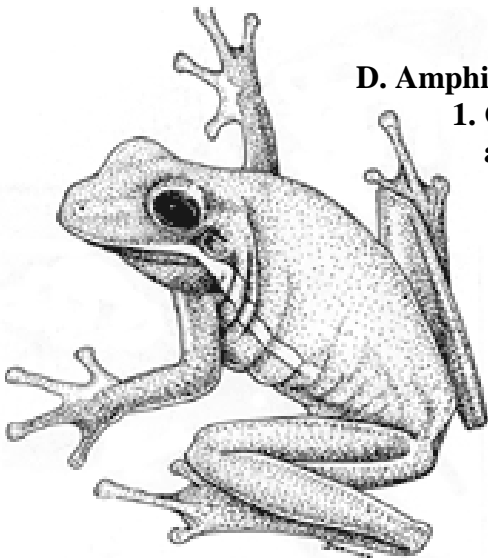
1. Love finned fish
2. Lung fish (have both gills and lungs)
3. Ray finned fish



D. Amphibians – (Means double life)

1. Characteristics

- a. Moist skin without scales
- b. Exchange gases through skin or simple sac-like lungs
- c. Skeleton made of bone
- d. Three chambered heart
- e. Lay eggs in water
- f. Go through metamorphosis
- g. Ectotherms
- h. Hibernate
- i. Estivate – Slow their system during a dry hot period
- j. Includes, Frogs, toads, salamanders, and newts
- k. External fertilization
- l. Amphibians on the decline p. 414



E. Reptiles

1. Characteristics

- a. Ectotherms**
- b. Scales**
- c. Breathe through lungs**
- d. Three chambered heart**
- e. Internal fertilization**
- f. Lay eggs on land that have a leathery shell**

1. Amniotic egg

- a. Membranes form cushion and protection**
- b. Large food supply (yolk)**
- c. Pores that allow gas exchange**
- d. Hatch fully developed**
- g. Group includes: Lizards, snakes, turtles, crocodiles, alligators, and dinosaurs**

2. Three orders of reptiles exist today

- a. Turtles: Hard shelled**
- b. Crocodiles and alligators (Crocodylia)**
- c. Lizards and Snakes – Largest group of reptiles**

1. Lizards

- a. Movable eyelids**
- b. External ears,**
- c. Usually legs with toes claws and feet**

2. Snakes –

- a. No legs**
- b. No eyelids**
- c. No external ears**
- d. Jaw bone that can detach**

