

Biology 16.2

Fish

Class Agnatha (jawless fish)

1. Lamprey and hagfish
2. Habitat: aquatic
3. Organization: slender, tubelike
4. Symmetry: bilateral
5. Integument: smooth skin, no scales
6. Skeleton: cartilage, jawless
7. Musculature: innervated striated, cardiac, and smooth muscle tissues
8. Movement: 2 single dorsal fins for swimming
9. Nervous system/Senses: 1) Brain, 2) dorsal spinal cord, 3) cranial nerves, 4) spinal nerves, 5) sense organs
10. Behavior/activity: innate and reflex
11. Nutrition: Parasitic carnivores
12. Digestion: alimentary canal system. 1) buccal funnel, 2) rasp like tongue in mouth
13. Respiration: oval gill slits
14. Circulatory: 1) closed, 2) 2 chambered heart. Exothermic.
15. Immune system: Innate and specific. Big variation among classes.
16. Excretory: kidneys and liver
17. Reproduction/Embryology: oviparous
18. Life cycle: larvae stage to adult
19. A threat to edible fish in Lake Eerie

Class Condriichthyes (cartilaginous fish)

1. Sharks, rays, skates
2. Habitat: aquatic
3. Organization: streamlined or flat
4. Symmetry: bilateral
5. Integument: sandpaper like, tiny scales
6. Skeleton: cartilage
7. Musculature: innervated striated, cardiac, and smooth muscle tissues
8. Movement: dorsal and lateral fins for swimming
9. Nervous system/Senses: 1) Brain, 2) dorsal spinal cord, 3) cranial nerves, 4) spinal nerves, 5) sight, smell, touch, taste, vibration
10. Behavior/activity: innate and reflex
11. Nutrition: heterotrophic carnivores. Whale shark is omnivorous (zooplankton and phytoplankton)
12. Digestion: typical alimentary canal system. Replaceable, razor sharp triangular teeth in mouth
13. Respiration: gills
14. Circulatory: 1) closed, 2) 2 chambered heart. Exothermic.
15. Immune system: Innate and specific. Big variation among classes.
16. Excretory: kidneys and liver
17. Reproduction/Embryology: oviparous
18. Interesting facts
 - a. Great White shark found with intact horse in stomach
 - b. Electric ray can jolt prey with electricity

Class Osteichthyes (bony fish)

1. Osteo=bone Ichthyes= fish, :bony fish
2. Habitat: aquatic
3. Organization: most slender, flat, streamlined, air bladder for floating
4. Symmetry: bilateral
5. Integument: scales and mucous

6. Skeleton: bony
7. Musculature: innervated striated, cardiac, and smooth muscle tissues
8. Movement: fins for swimming
9. Nervous system/Senses: 1) Brain, 2) dorsal spinal cord, 3) cranial nerves, 4) spinal nerves, 5) sight, smell, taste, touch, vibration (no sound)
10. Behavior/activity: innate and reflex
 - a. schools of fish, porcupine fish
11. Nutrition: heterotrophic (carnivores, herbivores, and omnivores)
12. Digestion: typical alimentary canal system
13. Respiration: opercular gill
14. Circulatory: 1) closed, 2) 2 chambered heart. Exothermic except for Opah (*Lampris guttatus*).
15. Immune system: Innate and specific. Big variation among classes.
16. Excretory: kidneys and liver
17. Reproduction/Embryology: 1) oviparous, some viviparous 2) males often nurture the young, 3) catfish carries eggs in mouth (mouth brooding)
18. Interesting fish
 - a. flounder has both eyes on side of head and lays on ocean floor