

Unit 12: Vertebrates

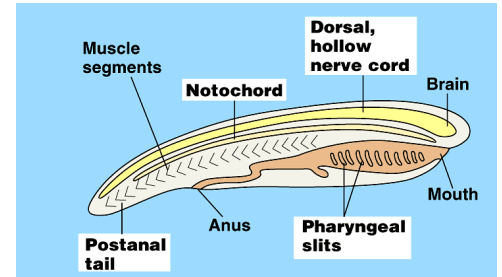
Ch. 30-33

Remember this is the Kingdom Animalia

Characteristics of Chordata

1) List four traits of Phylum Chordata.

1. notochord- long flexible supporting rod
2. pharyngeal pouches (paired structures in the throat region...develop into gills of fish)
3. dorsal hollow nerve cord-
4. post anal tail



Subphyla of Chordata

2) Give examples of members of the phylum Chordata (3 subphylum)

1. subphylum vertebrata- includes fish, amphibians, reptiles, birds, and mammals
2. Subphylum Cephalochordata- includes Lancelets
3. Subphylum Urochordata- includes Tunicates)

3) How do lancelets and tunicates feed?

- Suspension feeders, a process of capturing particles from the water

4) What bone structure is found in all vertebrates?

- back bone

Fish Ch. 30.2

I. Characteristics of Fish

5) What is a fish?

- aquatic vertebrates
- most have paired fins – movement
- most have scales – protection
- gills – gas exchange

6) Where is the dorsal fin located?

- On the top or back of the fish

7) What are the characteristics of the class Osteichthyes?

- Bony endoskeleton
- Swim bladder
- Paired fins

8) What are four classes of fish and examples?

- Myxini-hagfish
- Cephalaspidomorphi- lamprey
- Chondrichthyes- sharks and rays
- Osteichthyes- bony-fish

9) What are the two major groups of bony fish?

- Ray-finned
- Lobe-finned

II. Respiration in Fish

10) What does the operculum look like in fish?

- The operculum is a crescent shaped covering of the gills

11) What structure allows fish to absorb oxygen? What is the process?

- Gills allow fish to exchange gases
- The process of oxygen absorption is possible b/c of the counter-current flow

12) How many chambers to a fish heart?

- 2

13) What is the function of the kidney in fish?

- Excrete waste

14) What structure allows fish to be buoyant? What does it look like?

- Swim bladder... it looks like an air filled sac or bag

III. Adaptations in Fish

15) How do lampreys feed?

- Lampreys are parasite and use sucking disc to attach to other fish

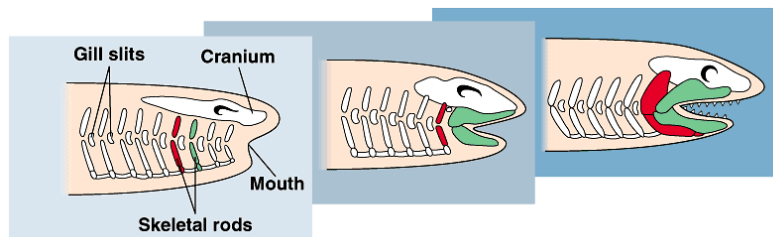
16) What is a coelacanth (see-la-kanth)?

- A lobe-finned fish that gave rise to amphibians

17) What are some characteristics of lungfish?

- Lungfish have primitive lungs that allow it to breath through it's mouth during droughts

18) What would the evolution of jawed fish from jawless like in a diagram?



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III. Reproduction in Fish

19) List 3 Types of Birth in Fish:

- Oviparous – eggs hatch outside the mothers body. (Salmon)
- Ovoviviparous – eggs hatch inside mother & young born live. (guppies)
- Viviparous – young obtain nutrients from mothers body & born alive. (some sharks)

20) Type of fertilization in Bony-Fish?

- External

21) How are shark eggs fertilized?

- Internally...NOT external

Amphibians Ch. 30-3

I. Characteristics of Amphibians

22) What words “amphi” mean?

- Both or double...living in water and on land

- 23) How chambers do their hearts have?
- 3
- 24) What type of consumers are amphibians?
- Carnivore
- 25) How do toads and frogs reproduce?
- They lay their eggs in the water
- 26) Explain their habitat. Why do amphibians have thin, moist skin?
- Wet environment, so they can respire (breathe)
 - Therefore they MUST live near or in water
- 27) What does ectothermic mean?
- Internal body temperature is regulated by the outside environment
 - aka cold-blooded

II. Adaptations

- 28) List characteristics that have allowed amphibians to live on land.
- Stronger bones and limbs to withstand the effects of gravity
 - Lungs for breathing
- 29) What kind of blood does the heart of an amphibian pump?
- Since amphibians have a 3 chambered heart the oxygen-rich blood mixes with the oxygen-poor blood

III. Response

- 30) What is the function of the nictitating membrane?
- A covering over the eye that protects the eye in water and prevents water loss on land... a structure that supports living on land and in water
- 31) What is the function of the tympanic membrane?
- external eardrum that vibrates sending sound waves to the inner ear.

IV. Metamorphosis

- 32) Where does fertilization occur?
- Fertilization in amphibians occurs externally

Be Familiar with the stages of tadpole to frog!!

V. Orders and examples

1) Urodela- salamanders and newts

2) Apoda- caecilians (legless salamanders)

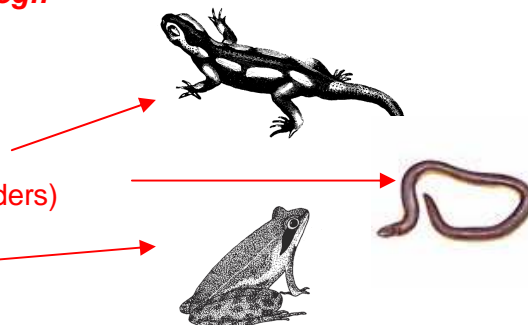
3) Anura- frogs and toads

33) What does a salamander look like?

- Slimy lizard

34) What order are amphibians w/o tails classified in?

- Anura



Reptiles Ch. 31-1

I. Characteristics of Reptiles

35) Are reptiles endothermic or **ectothermic**? (Circle correct one)

36) Describe the skin of reptiles.

- **Scaly, dry skin to prevent water loss and protection for living on land**

37) What kind of heart do all reptiles have EXCEPT alligators and crocodiles?

- **3 chambered**

II. Evolution

38) What is thought to have caused the mass extinction of dinosaurs?

- **A natural disaster such as a meteorite crashing into earth**

III. Form and Function

39) What characteristics had to evolve to move from water to land and survive arid environments?

- **Well developed lungs**
- **Water-conserving excretory system**
 - a. **uric acid** – terrestrial waste
 - b. **ammonia** – aquatic waste (crocs & gators!)
- **Strong limbs**
- **Internal fertilization**
- **Amniotic eggs contributed to success on land**

40) What are pit organs?

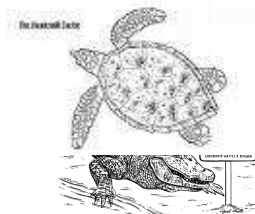
- **heat sensitive organs found on snakes of the viper family.**

III. 4 Orders and examples

1) **Squamata (lizard and snakes)**

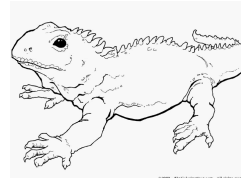


2) **Testudines (turtles & tortoises)**



3) **Crocodylia (crocodiles & alligators)**

4) **Sphenodonta (tuatara) RARE! Only ONE species in the ENTIRE order, found in New Zealand**



Birds Ch. 31-2

I. Characteristics of Birds

- 41) How are birds different from reptiles?
- Feathers, 4 chambered heart, endothermic, flight, hollow bones
- 42) How chambers do their hearts have?
- 4
- 43) Are birds endothermic or ectothermic? (Circle correct one)

II. Evolution

- 44) Birds are thought to have evolved from?
- Evolved from dinosaurs similar to velociraptors.

III. Features and Bones

- 45) Describe the bones of birds.
- Hollow and light weight
- 46) What did features replace as the body covering of birds?
- Scales
- 47) What would the best beak for scooping look like?
- Spoon-shaped

IV. Digestion/Excretion

- 48) What structure in birds temporarily stores food?
- Crop
- 49) What is the function of the cloaca?
- Releasing waste
- 50) What form of nitrogenous waste do birds excrete?

V. Respiration/Reproduction

- 51) How bird respiration is made more efficient?
- One-way air flow constantly exposes bird to oxygen-rich air.
- 52) What is the chorion?
- Regulates the transfer of oxygen to embryo and release of carbon dioxide
- 53) What gender of songbirds actually sings the melodious songs?
- Male

VI. Orders and examples

- 54) Why would a bird need talons?
- Grasping their prey as they swoop down-Falconiformes

Mammals Ch. 32

I. Characteristics of Mammals

- 55) Are mammals endothermic or ectothermic? (Circle correct one)
- 56) What are the functions of hair?
- Insulation
- 57) What groups of vertebrates have a four-chambered heart?
- Order Crocodylia and Mammals

- 58) What would teeth used for cutting biting look like?
- Incisors
- 59) What evolved from the Therapsids?
- Mammals
- 60) What do large eye sockets on early mammals suggest?
- Nocturnal
- 61) What type of birth do egg laying mammals have?
- Oviparous
- 62) Why do all monotremes and most marsupials live in Australia and New Guinea?
- Marsupials occupied niches in Australia and New Guinea that would be developed by Eutherians on other continents
- 63) What is a diaphragm muscle?
- Muscle below rib-cage, and when contracted it draws air into lungs
- 64) What group of vertebrates have lungs with air sacs and a diaphragm muscle?
- Mammals
- 65) How do bats use sound?
- Echo-location is used to determine size, location, direction, and speed of moving objects
- 66) What is the function of the placenta?
- Provide oxygen and nourishment for developing embryo
- 67) What is the main difference between marsupials and placentals?
- Length of development in Uterus
 - Short for Marsupials
 - Long for Placentals
- 68) What would a member of the Order Insectivora and Xenarthra look like?
- 69) What type of birth do egg-laying mammals have?
- Oviparous-eggs hatches outside mother

Comparing Chordates Ch. 33

READ!