Vertebrate and Invertebrate Animal Structure Notes (6-3.1)

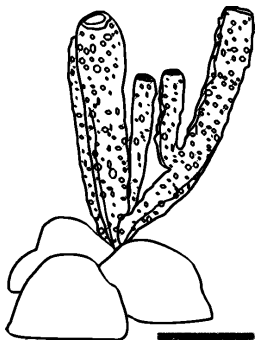
- *compare* the characteristic structures of vertebrates and invertebrates: detect ways that these organisms are alike and different
-*identify* specific invertebrate and vertebrate groups based on a description of characteristics;
-*illustrate* the different kinds of vertebrates and invertebrates by their distinctive differences;
-*classify* an animal into a particular group based on its characteristics.

The Animal Kingdom is divided into 35 different phyla.
These phyla can be classified into 2 groups (vertebrates/invertebrates) based on external & internal physical traits.
All animals share several common characteristics:
o 1) Their bodies are multi-cellular.
o 2) They are heterotrophs (cannot make their own food) and must get their energy by eating plants or other animals.
- herbivores (eat plants), carnivores (eat meat), omnivores (eat plants and meat); detrivores (eat dead material)
o Their major functions are to 3) obtain food and oxygen for energy, 4) keep their internal conditions in balance, 5) move, 6) reproduce (mostly sexual reproduction), and 7) remove waste

Invertebrates comprise the remaining phyla of the Animal Kingdom. They include sponges, segmented worms, echinoderms, mollusks, and arthropods. Invertebrates share certain characteristics:
They do NOT have backbones or internal skeletons. They are more simple organisms.
Some have external skeletons, called *exoskeletons*.
Invertebrates can be classified based on their shape (symmetry).

- Radial symmetry: many lines of symmetry that pass through a central point (Ex. pie plates, bicycle wheels)
- Bilateral symmetry: One line of symmetry that splits the object in half (Ex. spoon, eyeglass)
- Asymmetry: not symmetrical (Ex. Lumpy clay ball)

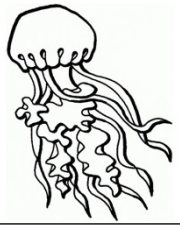
Sponges

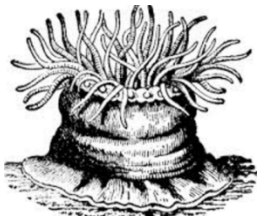


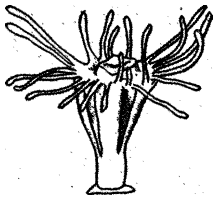
Very simple animals that have many *pores* (holes) through which water is filtered.
Water moves into a central cavity and out through a hole in the top.
Sponges obtain their food and eliminate wastes through this passage of water.
Filter feeders: have specialized cells for obtaining food and dissolved oxygen from the water.
Asymmetrical
Examples: Sponges (Barrel Sponge, Stove-Pipe Sponge, Vase Sponge, Branching Tube Sponge)

Cnidarians

Cnidarians means "stingers": use stingers to capture their prey and to defend themselves
Radial symmetry
Ex: jellyfish, sea anemones, corals, hydra

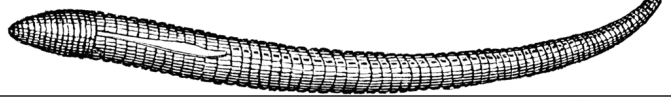






Segmented worms

Annelid- name for segmented worm (anus-means ring)
Have long tube-like bodies that are divided into segments.
They are the simplest organisms with a true nervous system and blood contained in vessels.



A long digestive tube runs down the length of the worm's inner body.

Worms take in dissolved oxygen from the water through their skin.

Most are predators and decomposers. They obtain food using a mouth, then digest their food.

Bilateral symmetry

Ex: earthworms, leeches, seafloor worms

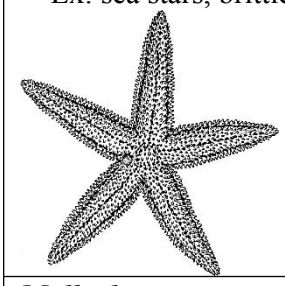
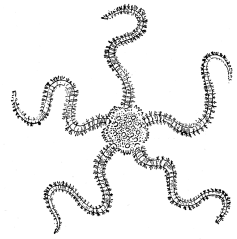
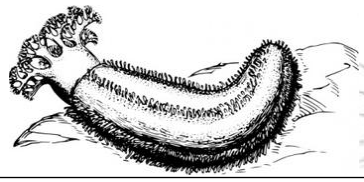
Echinoderms

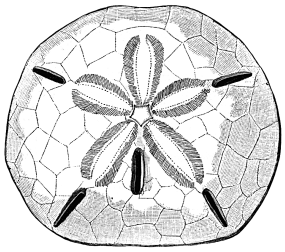
means "spiny-skinned"-spines for protection

Five-part radial symmetry: have 5 *arms* that extend from the middle body outwards.

A water vascular system that has fluid-filled tubes that when filled act as suction cups: allows them to move, exchange carbon dioxide and oxygen, capture food, and release waste

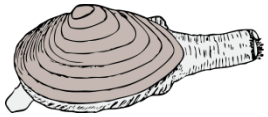
Ex: sea stars, brittle stars, sea cucumbers , sea urchins, sand dollar



Mollusks

Have unsegmented soft bodies; most have a thick muscular foot for movement, eating, or to open and close their shells. Some are filter-feeders.

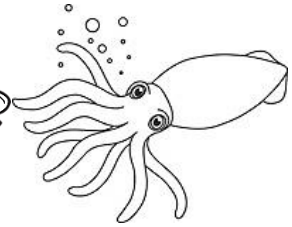
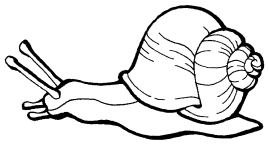
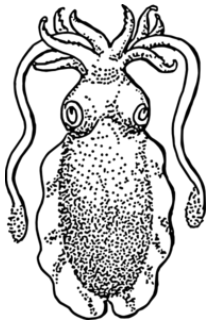
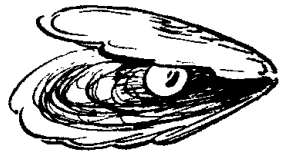
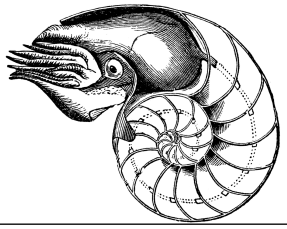



They have more developed body systems than sponges or worms.

They take in oxygen through gills or lungs, and some have shells.

Bilateral symmetry

Ex: octopi, squid, snails, slugs (no shell), clams, oysters, scallops, cuttlefish, na utilus

Arthropods

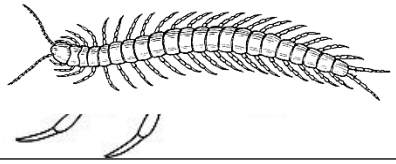
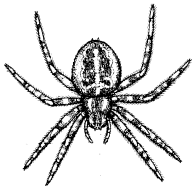
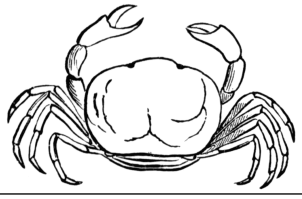
Arthropod means "jointed foot"

Have jointed legs, segmented bodies, some have wings, exoskeletons (hard outer covering), mandible jaws for chewing food

They obtain oxygen from the air through gills or spiracles (air tubes)

Bilateral symmetry

Ex: insects (flies, ants, beetles, bees, grasshoppers), centipedes and millipedes, arachnids (spiders, ticks, scorpions), and crustaceans (lobsters, shrimp, crabs)

Vertebrate Animals

Vertebrates comprise only one phylum of animals. They include fish, amphibians, reptiles, birds, and mammals. Vertebrates share certain physical characteristics:

They have backbones, an internal skeleton (*endoskeleton*) for muscle attachment and growth, and muscles.

They have blood that circulates through blood vessels and lungs (or gills) for breathing.

They have a protective skin covering.

Most have legs, wings, or fins for movement.

They have a nervous system w/ a brain that processes information from their environment through sensory organs. They are more complex organisms.

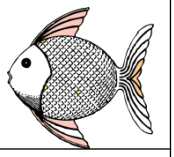
Vertebrates differ in the way that they control their body temperature.

In some (fishes, amphibians, and reptiles), their body temperature is close to that of their environment. They are considered *cold-blooded*, or *ectothermic*.

In others (birds and mammals), their body temperature stays constant regardless of the temperature of the environment. They are called *warm-blooded*, or *endothermic*.

Fish

Are cold-blooded (ectothermic); most obtain dissolved oxygen in water through gills; most lay eggs; have scales; have fins; and live in water.



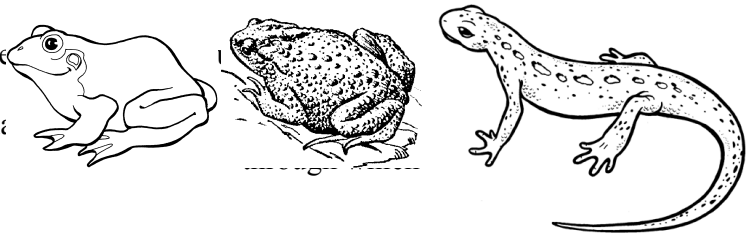
Amphibians

Are cold-blooded (ectothermic); most can breathe in wate
adults; go through metamorphosis; lay jelly-like eggs.

The major groups of amphibians are frogs, toads, and sal

Frogs and salamanders have smooth, moist skin,
part of their life in water and part on land.

Toads have thicker, bumpy skin and live on land.



Reptiles

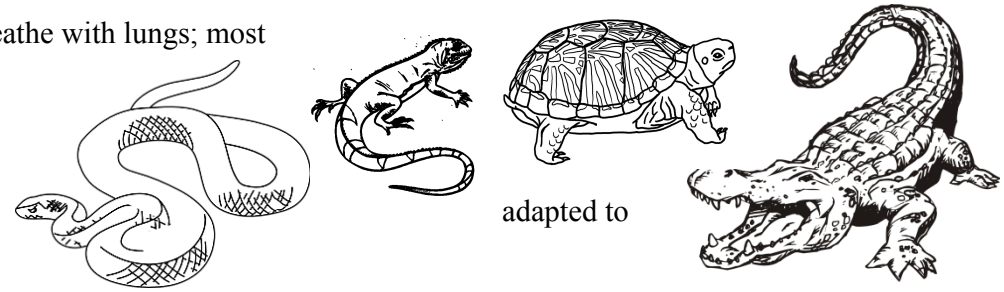
Are cold-blooded (ectothermic); breathe with lungs; most lay amniotic (covered) eggs,
although in so me the eggs hatch
inside the female; and have scales or plates.

Eggs, skin, and kidneys are
conserve water

adapted to

Ex: snakes, lizards, turtles,

alligators, and crocodiles



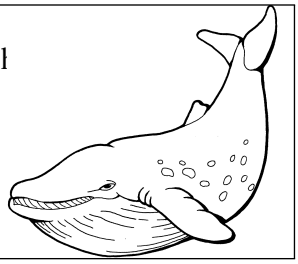
Birds

Are warm-blooded (endothermic); breathe with lungs; lay eggs; have feathers; and have a beak, two wings, and two feet. Most are adapted to fly

Mammals

Are warm-blooded (endothermic); breathe with lungs; most have babies that a l skin covered with fur or hair; and nourish young with milk produced by mother.

The 3 types of mammals are: Monotremes (ex. platypus). Marsupials (ex. kangaroo, opossum), and Placentals (ex. human, ho rse).



1) Which are vertebrates? a. hamster b. crab c. koala d. spider
2) Which are vertebrates? a. alligator b. fish c. dolphin d. bird
3) What do all vertebrates have in common?
   a. They live on land. b. They all have a hard internal skeleton or backbone.
   c. They all have legs. d. They are all warm blooded.
4) Vertebrates include which types of animals? A. Mammals B. Fish C. Amphibians D. Reptiles E. All of the following
5) Which are invertebrates? a. frog b. dragonfly c. worms d. fish
6) Which are invertebrates? a. spider b. crab c. bird d. starfish
7) What do all invertebrates have in common?
   a) They all have a soft skeleton made of fluid. b) They all have a hard external skeleton.
   c) They don't have a hard internal skeleton. d) They are all cold blooded.
8) Invertebrates include which types of animals?
   a) Protozoa b) Mollusks c) Crustaceans d) Insects e) All of the following
9) Which of the following is a characteristic shared by all animals?
   A. Their bodies have many cells. B. They eat autotrophs.
   C. They reproduce asexually. D. They have skeletons.
10) An animal has bilateral symmetry if __.
   A. no lines can be drawn to divide the animal into halves that are mirror images.
   B. many lines can be drawn to divide the animal into halves that are mirror images.
   C. one line can be drawn to divide the animal into halves that are mirror images.
   D. any line through the center of the animal divides it into halves that are mirror images.
11) Which of the following is true of all mollusks?
   A. They have shells. C. They have segments.
   B. They have soft bodies. D. They have gills.
12) An arthropod's tough outer covering is called __.A. an endoskeleton B. an exoskeleton C. armor D. a mantle
13) Fish take in oxygen through their __. A. fins B. gills C. scales D. vertebrae
14) Birds are the only animals that have __ A. scales B. feathers C. nests D. a heart w/ 4 chambers
15) An animal whose body temperature does not change much, even when the temperature of the environment changes, is called __. A. a temperature regulator B. a cold-blooded animal C. an endotherm D. an ectotherm
16) Which of the following are all endotherms?
A. reptiles and amphibians B. birds and mammals C. fish and birds D. reptiles and mammals
17) This animal is a(n) __. A. reptile B. amphibian C. mammal D. cnidarian
18) This animal has __.A. an exoskeleton B. jointed limbs C. a segmented body D. all of the following
19) This animal belongs to the group of invertebrates called __.
A. arthropods C. echinoderms
B. cnidarians D. mollusks
20) An animal whose body temperature stays close to that of its surroundings is a(n) _____.
21) What is an internal skeleton called? _____
22) What kind of symmetry has multiple lines that radiate from a central point? _____
23) What is a hard external skeleton called?_____

17)

18)

Word bank for 24: **arthropods, cnidarians, echinoderms, mollusks, sponges, worms**

a. Full of pores-
b. Joint-limbed-

c. Stingers-

d. Insects, spiders, and lobsters are members-

e. Sea urchins and starfish are members-

Word bank for 25: **amphibians, birds, fish, mammals, reptiles**

a. Alligators and snakes are members-

b. Bats, whales, and cats are members-

c. Sharks are members-

d. Undergo metamorphosis-