Biology 15.3
Spiders, centipedes, and millipedes

Class Arachnida

1. Mostly spiders and ticks, but include scorpians & mites. Most harmless, but some harmful.
2. Habitat: mainly terrestrial
3. Organization: Arthropoda body pan, Organs bathed in hemolymph in the hemocoel
    a. Body segments: cephalothorax and abdomen
    a. 4 pairs of walking limbs (8 total)
4. Symmetry: bilateral
5. Integument: exoskeleton of chitin
6. Skeleton system: exoskeleton of chitin. jointed appendages.
7. Muscle system: spiders use striated muscle cells to fold legs, but use hydraulic pressure to extend.
8. Movement: mobile by means of 8 legs. Arachnids do not have wings.
9. Nervous system/ Senses: Ganglia can occupy 20-30% of the cephalothorax. Nerves lead to legs, eyes, and rest of body. Two pairs antennas (smell, touch, taste), Most have four pairs of simple eyes, Some have no eyes. body 'hairs' for touch, hearing, and vibration. They do not have antennas and mandibles. Spiders. Statocyst for balance.
10. Behavior/activity: interactive
11. Nutrition: Heterotrophic, carnivorous, herbivorous, and omnivorous. There is only one known herbivorous spider species.
12. Digestive system: External digestion involves injecting digestive enzymes into prey, then sucking liquefied tissues.
13. Respiratory system: book lungs: only in arachnids (air -> slit in abdomen -> lungs)
14. Circulatory system: Open circulatory system with an autonomic, single chambered tube heart
15. Immune system: innate humoral and cellular non-specific and specific
16. Excretory system: malpighian tubules used to excrete uric acid, etc.
17. Reproductive system: dioecious. Female lays eggs in egg sac. Some by live birth.
18. Embryology/Life cycle: spiderlings (miniature adults) hatch from eggs in an egg sac. Some by live birth.
19. All spiders produce silk that emerges from it's spinnerets.
    b. Spinnerets: silk producing glands used to form webs
    c. Spider web is stronger than steel.
    d. Female spiders sometimes eat their mates.
    e. Some cultures serve spiders as food.
    f. Daddy longleg spiders (pholcids) venom is not deadly to humans. The real daddy longlegs (opiliones) are not spiders and have no venom sack or fangs.
    g. Black widow: neurotoxin cause intense pain, muscle spasms, vomiting, but rarely fatal
    h. Brown recluse: small, brown spider with violin shaped marking on cephalothorax. Toxin kills tissue and may be fatal
    i. Tarantula: large hairy spider
    j. Scorpians: poisonous stinger in tail end, painful
    k. Ticks: blood sucking parasites, transmit diseases such as Rocky Mountain spotted fever and lymes disease
    l. Mites: cause mange and other skin diseases. Chiggers (red bugs) are mites

Class Chilopoda

1. Centipedes
2. Habitat: subartic environments, deserts, and moist areas such as leaf litter, under logs or rocks
3. Organization: flat body of head and many body segments with one pair of legs per body segment. No wings. Organs bathed in hemolymph in the hemocoel
4. Symmetry: bilateral
5. Integument: exoskeleton of chitin
6. Skeletal system: exoskeleton of chitin. jointed appendages.
7. Muscle system: striated
8. Movement: mobile by means of many legs with kinematic wave motion.
9. Nervous system/ Senses: CNS and PNS. One pair of antennae and compound eyes.
10. Behavior/activity: interactive
11. Nutrition: Heterotrophic, carnivorous: insects and small animals.
12. Digestive system: 1 pair of venomous claws/fangs underneath the head
13. Respiratory system: tracheae
14. Circulatory system: Open circulatory system with an autonomic, single chambered tube heart.
15. Immune system: innate humoral and cellular non-specific and specific
16. Excretory system: malpighian tubules used to excrete uric acid, etc.
17. Reproductive system: Dioecious.
18. Embryology/Life cycle: Eggs to adult. Some species are matriphagic. The offspring eat their mother.

Class Diplopoda

1. Millipedes
2. Habitat: found in most terrestrial habitats on all continents but Antarctica.
3. Organization: Organs bathed in hemolymph in the hemocoel. Most cylindrical (some flattened) body with head, short thorax and many abdominal segments. Two pairs of legs per body segment. No wings.
4. Symmetry: bilateral
5. Integument: exoskeleton of chitin
6. Skeletal system: exoskeleton of chitin. jointed appendages.
7. Muscle system: striated
8. Movement: mobile by means of many legs with kinematic wave motion.
9. Nervous system/ Senses: One pair of antennae and simple eyes.
10. Behavior/activity: interactive
11. Nutrition: Heterotrophic, detritivores. They feed on detritus.
12. Digestive system: chewing mouthparts.
13. Respiratory system: tracheae
14. Circulatory system: Open circulatory system with an autonomic, single chambered tube heart
15. Immune system: innate humoral and cellular non-specific and specific
16. Excretory system: malpighian tubules used to excrete uric acid, etc.
17. Reproductive system: Dioecious.
18. Embryology/Life cycle: Eggs to adult form. body segments increase in number after each molt.
19. Some millipedes are mildly poisonous, but none are venomous.