**Invertebrate Diversity**

* To be filled out while you view the lectures and read the assigned text.

1. Animals evolved approximately \_\_\_\_\_\_\_\_\_\_\_\_\_\_ yeats ago.
2. Explain how the colonial behavior of choanoflagellates is believed to have evolved into the multicellular animal.
3. Describe the 4 key features that define the animal kingdom
4. List the major branching points that occur in the evolutionary history of the animal kingdom.
5. What are two features that animals with radial symmetry lack?
6. Explain the difference between a protostome and a deuterostome.

Major Invertebrate Phyla

Use the lecture presentation and your textbook to define and describe the following groups of animals:

1. Sponges
   1. Phylum:
   2. Characteristics:
   3. Describe the three types of cells found in a sponge and give the function of each.
   4. What is the purpose of spicules?
2. Sea Anemones and Jelly Fish
   1. Phylum:
   2. Characteristics:
   3. What is the purpose of a nematocyst?
3. Flatworms
   1. Phylum:
   2. Characteristics:

* 1. Examples:

1. Segmented Worms
   1. Phylum:
   2. Characteristics:
   3. Examples:
2. Animals with a Calcium Shell
   1. Phylum:
      * Gastropod Characteristics:
      * Bivalve Characteristics:
      * Cephalopod Characteristics:
3. Roundworms
   1. Phylum:
   2. Characteristics:
   3. Examples:
   4. What it the relationship nematodes have with arthropods?
4. Phylum Arthropoda
   1. Characteristics:
   2. Why are arthropods considered to be the most successful animal phylum?
   3. Major Groups
      * Insects:
        1. Characteristics:
        2. Examples:
      * Arachnids :
        1. Characteristics:
        2. Examples:
      * Myriapods:
        1. Characteristics:
        2. Examples:
      * Crustaceans:
        1. Characteristics:
        2. Examples:
5. Sea Stars and Sea Urchins
   1. Phylum:
   2. Characteristics:

**Insects Revisited:**

1. What is one special adaptation that insects demonstrate that other invertebrates do not?
2. The insect body is divided into three distinct regions, each specialized for different functions.  Identify the functions of the following segments:
   * + - * Head
         * Thorax
         * Abdomen
3. In the animal world the most important survival strategy that must precede even reproduction in adult stages is feeding.  Insects have devised a variety of structures and methods for specializing in obtaining nutrients. Identify and describe the structures used by the following animals.
   1. Grasshoppers
   2. Flies
   3. Butterflies & Moths
   4. Mosquitoes
4. Name the three different types of developmental sequences seen in insects.
5. Complete metamorphosis includes the following stages: egg > \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is called a chrysalis in the context of butterflies and finally the > \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (which has the ability to reproduce) and lay more eggs, starting the whole cycle over again.
6. Give four examples of animals that demonstrate complete metamorphosis.
7. In the incomplete metamorphosis developmental sequence the stages are: \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (juveniles), and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. Give at least two examples of animals that show incomplete metamorphosis.
9. Beetles are the most abundant group out of all the insects, do you know which type of metamorphosis they undergo? Complete or Incomplete (circle your response).