Name _____ Course/Section_____

Date _____ Professor/TA _____

Activity 32/33.1 What can we learn about the evolution of the animal kingdom by examining modern invertebrates?

Fill in the chart on the next two pages to organize the major characteristics of key invertebrate phyla.

Key invertebrate phyla								
Characteristics	Porifera	Cnidaria	Platyhelminthes	Nematoda	Annelida	Mollusca	Arthropoda	Echinodermata
Examples of organisms	*Sponges*							
Number of tissue layers in embryo	*Doesn't apply*	*2; ectoderm and endoderm*						
Tissue versus organ level development	*Quasi tissue level*	*Tissue level*						
True muscle cells?	*No*	*No; have epithelio-muscular cells*						
Symmetry? Cephalization?								

	Key invertebrate phyla							
Characteristics	Porifera	Cnidaria	Platyhelminthes	Nematoda	Annelida	Mollusca	Arthropoda	Echinodermata
Coelom? Type?								
Digestive tract? Type?								
Circulatory system? Type?								
Nervous system? Type?								
Other								

Using the information in the chart and in Chapters 32 and 33 of Biology, 7th edition, answer the questions.

1. What set of characteristics is shared by all of the invertebrate animal phyla in the chart?

2. What unique combination of characteristics defines each of the invertebrate phyla as separate from the other phyla?

3. If you compare the characteristics of one phylum of the invertebrates with the next, what key differences separate the groups from each other?

4. a. Looking across the rows, what major trends appear to occur in the evolution of various organs or organ systems in these animal groups?

b. Does this analysis provide evidence for or against the statement: "Evolution adds onto or modifies what already exists"? Explain.

Name _____ Course/Section _____

5. The chart organizes the major groups of animals based on grade or shared body plan features. What changes would you need to make in this organization to reflect the possible phylogenetic relationships uncovered using molecular evidence?

6. How would your answers to questions 2, 3, and 4 differ (if at all) if the chart were rearranged to reflect changes in relationships based on molecular evidence?

7. A number of developmental characteristics are used to determine evolutionary relationships among animal phyla.

a. What evidence is used to link Annelids, Arthropods, and Molluscs evolutionarily?

b. What evidence is used to separate these phyla from the Echinoderms and Chordates?

8. In biological terms, a group of organisms is said to be successful if it represented by a large number of species or if the mass of all the organisms in the group is large. (In both cases, large is determined relative to other groups or organisms.) Given this definition of success, which of the major groups of animals would you argue is the most successful? Be sure to provide evidence for your argument.