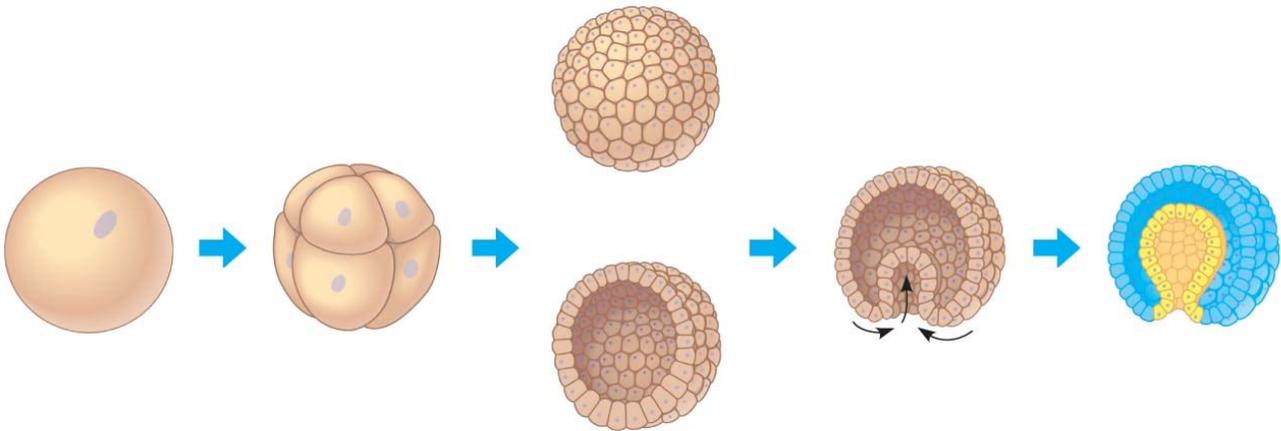


Name \_\_\_\_\_ Period \_\_\_\_\_

**Chapter 32: An Introduction to Animal Diversity**

**Concept 32.1 Animals are multicellular, heterotrophic eukaryotes with tissues that develop from embryonic layers**

1. Like the fungi, animals are multicellular heterotrophs. How do they feed?
2. What two types of specialized cells do only animals have?
3. Most animals reproduce \_\_\_\_\_, and the \_\_\_\_\_ stage dominates the life cycle.
4. Animal development requires its own vocabulary to describe the stages that are seen in all developing embryos. To help learn them, label each stage shown in this figure.



5. Your sketch labels should include the following terms. Define each one:

**zygote**

**blastula**

**gastrula**

**blastopore**

6. Explain these terms:

**cleavage**

**gastrulation**

**metamorphosis**

7. All eukaryotes have sets of regulatory genes containing common sets of DNA sequences called *homeoboxes*. What are the unique homeobox genes of animals called?

***Concept 32.3 Animals can be characterized by “body plans”***

8. Which animal group lacks symmetry? \_\_\_\_\_

9. Two types of symmetry are seen in all other animal groups. Name and describe them in words or with a sketch.

10. What is the symmetry of a jellyfish? \_\_\_\_\_ of a worm? \_\_\_\_\_ of a dog?  
\_\_\_\_\_

11. Animals that have *bilateral symmetry* have a front and rear. Draw a sketch of a cat, and label these regions: *anterior*, *posterior*, *dorsal*, and *ventral*.

12. Does your cat have whiskers, eyes, and ears? With *bilateral symmetry*, major sensory structures and the “brain” are concentrated in the head region. What is this area called?

13. Many animals with radial symmetry are *sessile*. What does this mean?

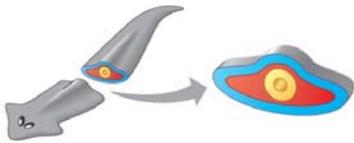
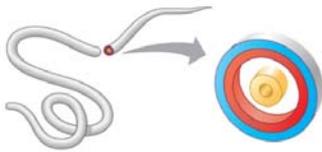
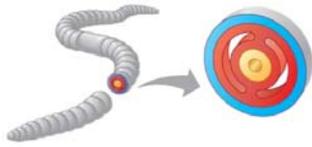
14. How is radial symmetry an advantage to *sessile* or *planktonic* animals?

15. The process of *gastrulation* results in concentric layers in the embryo and the development of a body tube called the *archenteron*, which becomes the gut. Return to the figure in question 4, and label the *archenteron* and the three tissue layers: *endoderm*, *ectoderm*, and *mesoderm*. If this diagram is not printed in color, use pencils to color the ectoderm blue, the mesoderm red, and the endoderm yellow. These colors are used by convention for each tissue type.
16. Which animal groups have only two tissue layers and are said to be *diploblastic*?
17. For a *triploblastic* animal, give at least two organs or organ systems that arise from each tissue layer (also called *germ layer*).

<b>Germ Layer</b>	<b>Organ or Organ System</b>
<i>endoderm</i>	
<i>mesoderm</i>	
<i>ectoderm</i>	

18. Now we are going to move into a discussion that many students find confusing. Pay close attention! What is a *coelom*?
19. The definition you have written should say the body cavity is surrounded by mesoderm on *both* sides. What do we call the animal groups that have a body cavity with mesoderm on only *one* side?
20. And what are the animal groups called that have *no* body cavity?

21. Here's the point our students find confusing: the *gut* or *digestive tube* is not a *coelom*! All the animals sketched below have a digestive tube, but only one has a true coelom. Using the colors described in question 15, color the germ layers, and label these representative animals *coelomate*, *pseudocoelomate*, and *acoelomate*. Indicate the body cavity and gut in the pictures. Also give the common names of the animals shown.

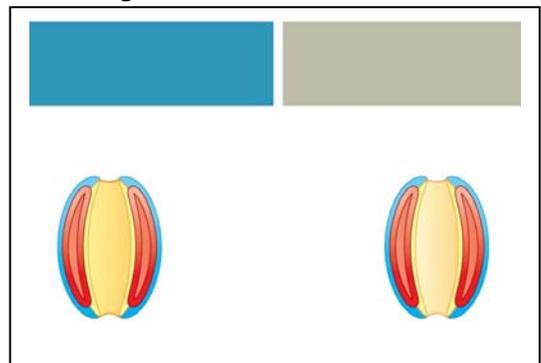


22. What are three functions of the body cavity?

### Protostome and Deuterostome Development

This concept is one our students often find difficult, but it is important to help you understand the major features that are used to organize the animal groups. Stick with it until you know what is meant by being a *protostome* or *deuterostome*. Let's begin with explaining the meaning of these words based on their roots:

*stom-* = mouth  
*proto-* = first  
*deutero-* = second



With a *protostome*, the *blastopore* (which is the opening into the archenteron) becomes the mouth (*first mouth*), and a second opening in the body tube will form the anus.

With a *deuterostome*, the blastopore will be the anus, and a second opening becomes the mouth (*second mouth*).

23. Label *protostome*, *deuterostome*, *mouth*, *anus*, and *digestive tube* on the figure above.
24. What forms the mouth in a *deuterostome*?
25. Now let's layer on another set of words based on the early mitotic divisions of the embryo called *cleavages*. Study the figure below. If the cells are lined up over each other in the eight-cell embryo, the cleavages are said to be *radial*. If the top layer is rotated relative to the lower layer, the cleavages are said to be *spiral*. Label the cleavages below.
26. If each cell in the early embryo has the capacity to develop into a complete embryo, what is this type of cleavage called?
27. What type of cleavage is it if the developmental fate of each embryonic cell is rigidly "determined" very early?
28. You will notice that most animals have *spiral* and \_\_\_\_\_ *cleavage* or *radial* and \_\_\_\_\_ *cleavage*.
29. Label the figure below with *protostome* and *deuterostome*, *spiral* and *determinate cleavage*, and *radial* and *indeterminate cleavage*.



30. Many times you have heard that taxonomy is in flux. Your text shows two different phylogenetic trees based on analysis of different criteria. Use the phylogenetic trees to answer these questions.

*Animals in which phylum or phyla . . .*

- a. lack symmetry and true tissues?
- b. show radial symmetry and are diploblastic?
- c. have three tissue layers, but lack a body cavity?
- d. show bilateral symmetry and have a pseudocoelom?
- e. have a true coelom and are protostomes?
- f. have a true coelom and are deuterostomes?
- g. are your closest relatives?

If you can group the animal phyla based on the characteristics above, you are ready for the most common type of animal questions you will see on the AP Biology exam!

*Testing Your Knowledge: Self-Quiz Answers*

Now you should be ready to test your knowledge. Place your answers here:

1. \_\_\_\_\_ 2. \_\_\_\_\_ (you may omit #3) 4. \_\_\_\_\_