

SECTION 17-2 REVIEW**SYSTEMATICS****VOCABULARY REVIEW** Define the following terms.

1. systematics _____

2. phylogenetic diagram _____

3. cladistics _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. The scales of snakes and the scales of pangolins
- | | |
|-----------------------------------|---|
| a. are shared derived characters. | c. suggest descent from a common ancestor. |
| b. are homologous structures. | d. evolved independently in the two groups. |
- _____ 2. In cladistics, what term is used for a group of organisms that includes an ancestor and all of its descendants?
- | | |
|----------|------------|
| a. class | c. phylum |
| b. clade | d. species |
- _____ 3. The molecular-clock model of evolutionary relationships is based on the assumption that changes in macromolecule sequences
- | |
|---|
| a. are not random. |
| b. are affected by natural selection. |
| c. are greater in species with more-distant common ancestors. |
| d. occur at different rates in different organisms. |
- _____ 4. One example of a derived character is provided by the
- | | |
|-----------------------|--------------------------------|
| a. feathers of birds. | c. scales of pangolins. |
| b. scales of snakes. | d. chromosomes of chimpanzees. |
- _____ 5. Which of the following do cladistic taxonomists NOT compare when hypothesizing evolutionary relationships among organisms?
- | | |
|-------------------------------|------------------------------|
| a. morphological similarities | c. homologous chromosomes |
| b. analogous structures | d. shared derived characters |

SHORT ANSWER Answer the questions in the space provided.

1. List three types of evidence used by systematic taxonomists to construct phylogenetic diagrams.

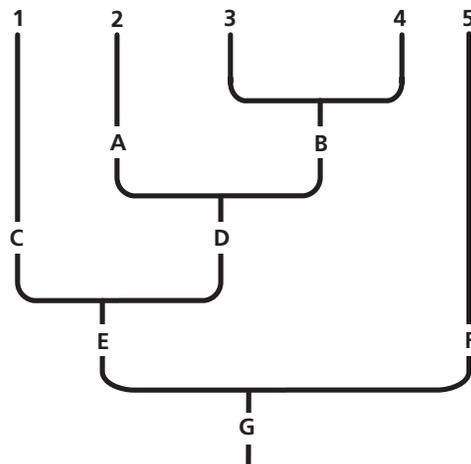
2. What is an out-group in cladistic analysis? _____

3. How do derived characters help cladistic taxonomists determine phylogenetic relationships?

4. **Critical Thinking** A paleontologist studying two modern species finds a 7-million-year-old fossil organism with a morphology similar to the modern species and concludes that it is an ancestor of both. A molecular biologist studying the amino acid sequence of a particular protein in both modern species concludes that the two species last shared a common ancestor 12.5 million years ago. Suggest possible reasons for the discrepancy in the two conclusions.

STRUCTURES AND FUNCTIONS Use the figure to answer the following questions.

The phylogenetic diagram shown below indicates the evolutionary relationships for a hypothetical group of modern organisms, labeled 1–5, and their ancestors, labeled A–G.



- Which two modern organisms are likely to be most closely related? _____
- What was the most recent common ancestor of organisms 2 and 3? _____
- What was the most recent common ancestor of organisms 1 and 5? _____