

Topic 7

Level 1

1. B
2. B
3. C
4. B
5. A
6. D
7. D
8. A

Level 2

1. A
2. C
3. C
4. C
5. C
6. C
7. A
8. D
9. C
10. C

Grid in

1. 15 million years ago

FRQ

1. The answer is 15 million years ago. The acceptable answer will have a range around this number, perhaps accepting any number between 14 and 16 millions of years ago.

ion

Three methods or types of evidence that scientists use to classify organisms and study their degree of evolutionary relatedness are fossil evidence, homologies, and molecular evidence.

1. Fossil evidence can be used to determine the relative ages of different groups because deeper strata contain older species. For example, there are no terrestrial species in the most ancient fossil layers, an indication that emergence of life onto land was a later evolutionary development. Fossils can also provide evidence for the appearance of key features, such as feathers or emergence of the tetrapod body plan. Feathers coincided with the emergence of birds.
2. Homologous structures can be used to determine evolutionary relationships. Species that were derived from the same ancestor should have similarities, called homologies. Here, scientists would look for homologous structures—structures that are similar in different species—and use these to tie organisms together. For example, the bones of a bat wing are the same as those of a lion's front paw—radius, ulna, humerus, and so on. This provides evidence of relatedness.
3. Biochemical similarities can indicate relatedness. Today, DNA analysis is widely used. Because DNA is heritable, related species should share common genes, and the more recently the species branched off from a common ancestor, the more similar their DNA should be. Studying the DNA of organisms makes