

Mechanisms of Evolution and Speciation

Name: _____
Period: _____ Date: _____

Access the *Understanding Evolution* website to help you answer the following questions. Use your own words. Wherever appropriate, write full sentences.

SPECIATION

1. What is a species, and how does it relate to a gene pool? **Use your own words.**
2. What are two facts that make it difficult to define a species?
3. Define "speciation" **in your own words**. EXPLAIN how one species becomes two species.
4. What are the three causes of speciation listed on the website?
5. What cause of speciation from the previous question would be responsible for speciation in the case of *Iguana iguana*?
6. Two animals look the same. Can you be sure that they are the same species? EXPLAIN.

Determine the cause of speciation in each scenario. Choose from geographic isolation (GI), reduction of gene flow (RGF), and reproductive isolation (RI). Write your answers on the lines.

7. Apple maggot flies lay eggs on hawthorns (which are native to America) and domestic apples (which were introduced to America by immigrants and bred). Females generally choose to lay their eggs on the type of fruit they grew up in, and males tend to look for mates on the type of fruit they grew up in. So hawthorn flies generally end up mating with other hawthorn flies and apple flies generally end up mating with other apple flies. _____
8. There many different species of finches have evolved on the Galapagos Islands, and they all came from a single original species. _____
9. In some snail species, the direction of shell spiraling is controlled by a single gene. Snails with left- spiraling shells cannot mate with snails having right- spiraling shells. _____
10. Stickleback fish live in two neighboring habitats of a lake: the lava habitat and the nitella habitat. The lava stickleback has much shorter spines than the nitella stickleback, caused by reduced predation pressure in the lava habitat. _____
11. In central and northern California, the Red-legged Frog (*Rana aurora*) breeds in fast-moving, temporary streams. Bullfrogs (*Rana catesbiana*) breed in permanent ponds. _____

MECHANISMS OF EVOLUTION

12. Summarize, in **one or two words each**, the six mechanisms of evolution addressed in the section "Mechanisms: the processes of evolution."

- a.
- b.
- c.
- d.
- e.
- f.

13. How is evolution defined on the Understanding Evolution website? You may copy the definition verbatim.

14. What is "gene frequency"? **Use your own words.**

15. List and SUMMARIZE, **in your own words**, the four mechanisms of evolutionary change.

- a.
- b.
- c.
- d.

16. What are three sources of genetic variation in populations?

17. Define "germ line mutation" **in your own words.**

18. Why don't all mutations impact evolution?

19. Give one **specific** example of an external influence that could create a mutation.

20. What are the three factors that, when present, can lead to natural selection?

21. Define “fitness” **in your own words**.

22. What three factors determine the fitness of an organism?

23. After reading the **entire** page titled “What about fitness?”, SKETCH an original picture that shows a fit individual compared to an unfit individual, *based on the definition in the previous question*.

24. Define “sexual selection” **in your own words**.

25. What choices do females make when they are ready to mate?

26. Define “adaptation” **in your own words**.

27. How do farmers and animal breeders use artificial selection to produce desirable organisms?

28. Define “coevolution” **in your own words**.