

Test 4 Study Guide Answers

Biology 11A

1. What led Georges Buffon to suggest that the Earth was more than 6000 years old?
fossils

2. What principle did Lamarck propose to explain animal morphologies such as the giraffe's long neck?

Acquired characteristics

3. Describe Natural Selection in your own words.

Your answers should include things like "traits/characteristics, best suited/better adapted, environment/surroundings, best fit/survive to reproduce/more offspring, reproductive success, time/generations."

4. What are homologous structures? How can we use them to relate people to cats or dolphins?

Structures with the same evolutionary origins but different functions. By using "comparative anatomy" we see similar bones, muscles, tendons, etc. in a structure showing us that we were perhaps once related by a common ancestor.

5. The Emu lives in Australia, but its cousin the Rhea lives in South America. They and their common ancestor are all flightless, so how do we explain their separation?

Biogeography= land masses separated and descendents of a species each evolved on their own.

6. What type of developmental structure is your appendix? (Hint: it's there, but you don't really use it)

vestigial structure

7. What type of evidence is there that connects whales with terrestrial origins?

Small hind leg/foot bones/pelvis= becomes smaller as not needed or used

8. What is embryology and what is the significance of the pharyngeal pouch?

Embryology shows us that the embryos of differing species are very similar. The pharyngeal pouch is an example of a part found in the embryos of many species that will later develop into the physical characteristics found on that particular organism.

Ex. In fishes it becomes the gills but in primates it becomes the ears and throat.

9. What are scientists comparing when they say Chimpanzees are 99% similar to Humans and what type of evolutionary evidence are they using?

They are comparing DNA sequences using molecular biology

10. There's a great t-shirt that says "If you don't believe in evolution, ask your doctor about Methicillin-Resistant Staphylococcus Aureus." What does this mean, and how does it relate to Natural Selection?

MRSA is strain of bacteria responsible for infections that quickly develop a resistance to antibiotics. With each new drug introduced to fight this bacteria, it soon evolves through natural selection where only the ones with resistance will survive to rapidly reproduce. Hence, "survival of the fittest".

11. What type of selection brought about my Aunt Kiki's pet Labradoodle?

Artificial selection

12. What's the difference between genetic drift and gene flow? Under which category do the bottleneck and founder effects fall?

Genetic drift is a change in the gene pool due to chance (has greater impact on smaller populations).

-bottleneck effect and founder effect are found under this category

Gene flow is the gain or loss of alleles from a population by the movement of individuals or gametes into or out of the population.

13. A biologist might study a certain "allele frequency" in the "gene pool" of a "population." Can you define all these terms?

Allele frequency is the amount of a particular allele in a population

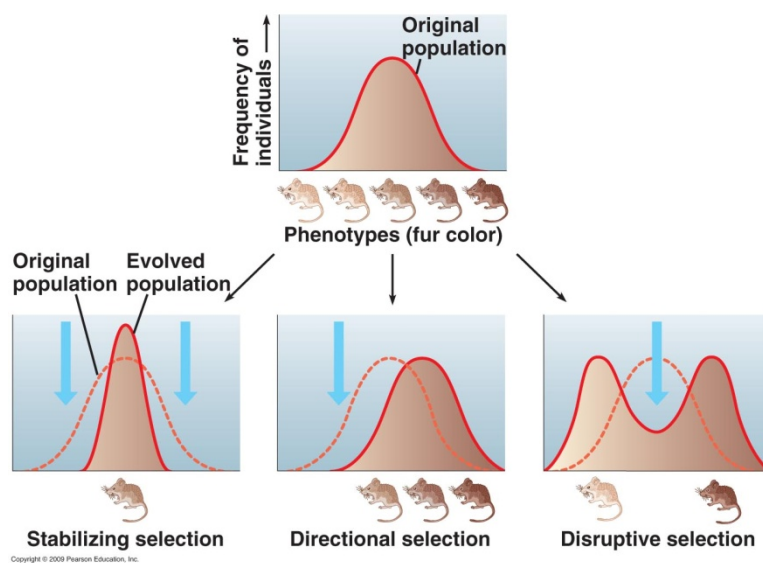
Gene pool is the sum of all genes in a population

Population is defined as the individuals of a species in a given location.

14. What type of selection is exemplified by bodybuilders and Irish Elk?

Sexual selection

15. Sketch a graph for each type of selection: directional, stabilizing, and disruptive



16. What weather conditions would dissuade time travelers from visiting prebiotic Earth? What 4 gases did early earth most likely contain?

Volatile conditions were intense like lightning, volcanic activity, and UV radiation. The gases most likely found were CO, CO₂, N₂, and CH₄.

17. What are the six steps that began life on this planet, to the best of our knowledge? (From the formation of organic molecules to LUCA).

- 1. Organic molecules form from prebiotic gases***
- 2. Polymers form***
- 3. RNA self replicates***
- 4. RNA and proteins cooperate***
- 5. Microspheres form***
- 6. LUCA***

18. What did Stanley Miller do, and based on figure 16.3A, what do you think his glasses prescription must have been?

He showed that organic molecules can be made from the gases found in "prebiotic" early earth.

19. You have billions of bacteria in your body, but do you have any Archaea? What three types are they and where are they found? What category do the two share?

Humans very seldom have archaea in their bodies.

Thermophiles live in areas of high heat (think "therm"ometer).

Halophiles live in areas of high salt concentration ("halo" latin word for salt).

Methanogens produce methane gas (yup- we all know what that is!)

Bacteria and archaea are both prokaryotes.

20. You found some "play-doh" and decided to make the three different shapes that bacteria take on. What would each shape be and what would you name it? Please use the correct scientific names not Fido or Fluffy.

Cocci are round

Baccilli are rod shaped

Spirochetes are twisted

21. From where might eukaryotes have gotten their chloroplasts or mitochondria?

Eukaryotes are thought to have evolved from the inward folding of developing ancient prokaryotes and their chloroplasts or mitochondria came from another smaller prokaryote moving into the cell (a process called endosymbiosis).

22. Are you a photoautotroph or a chemoheterotroph? Define yourself.

Chemoheterotroph- organism that obtains energy and carbon from organic molecules.

23. Are slime molds prokaryotes or eukaryotes? What are their closest cousins?

Slime molds are eukaryotes. Their closest cousins are fungi because they both absorb decaying matter.

24. How in the world could plants possibly survive on land?

Plants have adapted for life on land:

- **Anchored by rigid stem as opposed to algae which is supported by water.**
- **Roots provide anchorage and help absorb minerals and water**
- **Vascular tissues pull water and nutrients upward**
- **Waxy cuticle prevents moisture loss from the air and protects from scorching sun. Stomata opens for absorption of gases.**
- **Produces seeds or spores as means of reproduction**

25. Which came first, the bryophyte or the angiosperm? What are some big differences between them?

Bryophyte came first. They need a lot of water to survive and reproduce. They lack vascular tissue and make sperm.

Angiosperms have the most advanced vascular system. They make pollen and seeds which develop in a flower.

26. What are the reproductive parts on a gymnosperm? What about a fungus?

Gymnosperm=cone

Fungus=mushroom

27. Why are some fungi and algae really "lichen" each other?

Lichens are fungi living mutualistically with photosynthetic organisms. The fungi receives food from algae and the algae in return gets shelter and help absorbing and retaining moisture.

28. What major structure do we have that a lamprey doesn't?

Jawbone

29. What sets monotremes like the Duck-Billed Platypus apart from Eutherians?

Monotremes lay eggs and eutherians give birth to developed young and have a placenta.

30. What are some characteristics of prosimians, other than freakishly large eyes?

Oldest group, small size, small brain, good sense of smell, live in rain forests.

31. Why is it ridiculous to call Chimpanzees monkeys? What is the difference?

Chimpanzee is in the Ape family classified as a Hominoid more closely related to humans. Apes have shorter hindlimbs than forelimbs, walk on all fours, larger brain, many live off the ground, have complex social structure.

32. How old is "Lucy," and what type of Hominid was she?

Australopithecus afarensis , 3.24 million years old

33. Who was the first of the genus Homo to fashion tools?

Homo habilis ("the handyman")

34. When Hollywood makes the movie "Cro-Magnon vs. Neanderthal," who will win, assuming it's historically accurate plot-less tripe?

Cro-Magnon

35. What support is there for the "Out of Africa" hypothesis?

Fossil evidence- modern humans all very similar

DNA evidence

- ***DNA sequencing shows high similarity among individuals***
- ***All maternal DNA lineages lead to ancestors in Africa***
- ***Paternal DNA lineages (Y chromosome) support similarities***

36. What were the three big steps in the development of Human culture, and what allowed for this evolution?

1. Bipedalism,

2. brain enlargement,

3. evolution of prolonged prenatal care

Culture allowed for this evolution to occur

GOOD LUCK EVERYONE. KICK SOME BIO BUTT!!!