

Video Questions- What Darwin Never Knew

DNA, Genetics, and Evolution- Documentary on the Living Science of Evolution

PART 1- Darwin

1. What is the full name of the famous book written by Charles Darwin, and when was it published?
2. What is the relationship between Darwin's ideas and our modern understanding of genetics? Have we found Darwin to be fundamentally correct or incorrect in his understanding of how new species develop?
3. Describe Darwin's childhood and early career pursuits.
4. What was the HMS Beagle, and what was its mission?
5. Describe the Galapagos Islands.
6. What tools did he use to record his observations?

NOTE: Questions 7, 8, and 9 skip around in order in the video. You will have to go back and forth between observations and conclusions/reasoning.

7. Describe Darwin's key observations on the Galapagos Islands, as well as upon return to Britain. What specifically did he notice about the following?
 - a. Tortoises-
 - b. Finches-
 - c. Fossils of extinct organisms as compared to living organisms-
 - d. Embryos of developing organisms-
 - e. Animal breeding (dog example)-
 - f. His own family-

8. Explain Darwin's reasoning, based on the evidence above. How did he arrive at the following principles?
 - a. Descent with modification-
 - b. Natural selection/ adaptation-
 - c. Variation
9. How were Darwin's views different from the Victorian thinking of the time? How did they differ with the religious thinking of the time?

Part 2- Genetics- What Darwin Didn't Know

10. What is the Snickers Bar of the desert? The rock pocket mouse.
11. Describe the evolutionary change that has been observed in the mice in the AZ desert.
12. Describe the **evidence** and **reasoning** to support this claim: rock pocket mice have evolved light and dark fur to adapt to the light and dark backgrounds of the desert where they live.
 - a. Evidence:
 - b. Reasoning: (comes later in the video)
13. What is the vital quality of DNA that leads to evolutionary change?
14. Give 1 other example of a mutation that led to evolutionary advantages for specific species.
15. What was one erroneous assumption made at the beginning of the Human Genome Project?
16. Compare the number of genes in the human genome to one other organism described.
17. What big question did the results of the Human Genome Project present scientists with?
18. Explain how the study of embryology has led to a greater understanding of animal diversity.
19. How much of the human genome is non-coding or "junk" DNA?

20. Explain the experiment that led to flies with glow-in-the-dark spots on their wings.
21. What is a switch?
22. How has the discovery of switches contributed to our understanding of evolution? Give an example.
23. What is the difference between ocean and lake sticklebacks?
24. What is the connection between lake sticklebacks and manatees?
25. What were scientists able to discover by returning to the study of Darwin's finches?
26. Describe the 3 possible roles of genes, or segments of DNA:
- a.
 - b.
 - c.
27. Give evidence for the "great transformations" - the large evolutionary changes that have taken place over time
- a.
 - b.
28. What is the story, and significance of the fossil of the flat-headed fish found in the desert?
29. If you're a prey species your choices are to get _____, get _____ or get _____. Which did Tectonic seem to do?
30. Why was the paddlefish selected for study?
31. What are hox genes?

32. From a genetic and evolutionary perspective, how are humans unique as a species?
33. Explain our current understanding of the similarities and differences between humans and chimpanzees.
34. How did the Human Genome Project help with the quest for a cure for muscular dystrophy?
35. Explain the reasoning connecting discoveries of jaw strength to human brains.
36. How did the study of the genetic disorder microcephaly aid in the understanding of brain development?
37. Describe Katie Pollard's work.

Reflect After Viewing

1. How does this video help illustrate the principle of unity and diversity among living things? Use at least 3 specific examples.
2. How does this video help illustrate the idea that structure reflects function? Use at least 3 examples.
3. Explain your understanding of the relationship between genetics and evolution. Use separate paper if necessary.