

Great Transformations Video Guide

Instructions: As you watch the video, *Great Transformations*, answer the questions below.

Viewable on youtube: Search for PBS Evolution

Whales (start at 02:54)

1. If all of earth's history were compressed into an hour, when did the animals appear?

2. When did mammals 1st appear on land (in millions of years ago)?

3. What was the unique fossil that Phil Gingrich found in Pakistan? What features did it have?

4. What are *transitional forms*, and why are they important to the study of evolution?

5. What was the Sahara like 40 million years ago?

6. What was *Basilosaurus* like, how was it different from modern whales? Why was this important to understanding whale evolution?

7. Who was *Cynonyx*, and how did it evolve into modern whales? What were the key adaptations?

8. How is the movement of whales evidence of their evolutionary heritage? How is their way of moving different from that of fish?

Note: Can you believe that one of the scientists' name in this section is *Fish*?

Leaving the water (origin of tetrapods).

9. What is a tetrapod? When did the common ancestor of all the tetrapods live?

10. Where did the first tetrapod live?

11. Which came first: living on land, or having limbs?

12. What was *Acanthostega* like?

13. What was *acanthostega's* environment like? How were *acanthostega's* limbs adaptive?

Name: _____ Period: _____ Date: _____

Origin of Animals

14. When did animals 1st appear on land? What name is this event given?

15. Why was the emergence of animals a problem for Darwin?

16. What are trilobites? Who are some of their modern relatives?

17. What was *Pikaia* like (and why should we care)?

Mike Levine and Evo/Devo (THIS IS THE MOST IMPORTANT PART OF THE VIDEO)

18. What was the experimental organism Mike Levine worked with?

19. What was Bateson's insight about animal development, and how it could go wrong?

20. How does DNA control segmentation in animals?

21. What does the *antennopodia* gene do?

22. What kind of genes did McGinnis & Levine succeed in isolating?

23. What does the *eyeless* gene do? Is this the same gene in mice? Is this an analogy, or a homology?

24. In terms of genes, how does animal evolution work? What does that say about the relationship among the animals?

25. What does it mean to say that evolution is *conservative*?

What about us?

26. When did bipedal walking 1st emerge among the hominids?

27. Why are lemurs a good analog for looking at how bipedal walking emerged?

28. What is knuckle walking?

29. How is the human skeleton different from the chimp skeleton? List as many features as possible.

30. Did bipedal walking *have* to lead to human consciousness?

Summary/Conclusion

31. It's said that "Evolution makes use of the old to create the new." How was this shown in this video?

32. A key theme in this course is the *unity and diversity* of life. How was this shown in this video?