



## GREAT TRANSITIONS INTERACTIVE

Using the HHMI Click and Learn “Great Transitions Interactive,” you will explore the evolution of four-limbed animals from fish, focusing on transitional forms with features of both fish and tetrapods, and see the progression of anatomical changes from reconstructed fossil skeletons.

### INTRODUCTION

1. Tetrapods are \_\_\_\_\_. Examples of tetrapods include \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
2. Tetrapods first appear in the fossil record \_\_\_\_\_ million years ago.
3. Charles Darwin predicted that tetrapods evolved from \_\_\_\_\_. What observation leads to that hypothesis?
4. What evidence would you expect to find to support that hypothesis? What age rocks would you look in and why?

### ANATOMICAL FEATURES OF TRANSITIONAL FORMS

#### Gills or Lungs?

5. Fish use \_\_\_\_\_ to breathe underwater. (However, many species of lobe-finned fishes that evolved during the Devonian period also had \_\_\_\_\_.)
6. In fossils, what anatomical evidence indicates that gills were present? \_\_\_\_\_
7. Many transitional species had gills which means that they lived in \_\_\_\_\_.
8. Lungs allow an animal to breathe \_\_\_\_\_. Why did this adaptation evolve?
9. Tetrapods use \_\_\_\_\_ to breathe. Do any modern tetrapods have gills? Explain.



### **The Ribcage**

10. Why is a sturdy ribcage important for tetrapods?

### **Humerus (Limbs)**

11. What is homology? To what are fins homologous?

12. Why are lobe-finned fish thought to be the closest relatives to tetrapods?

### **Digits**

13. Most modern tetrapods have \_\_\_\_\_ digits on front limbs and \_\_\_\_\_ digits on back limbs, although some species have fewer. How does this number compare to the number of digits on the limbs of transitional fossil forms?

### **Head and Neck**

14. Why do many of the transitional fossils between fish and tetrapods have flat heads?

15. How did the anatomy of the shoulder and head change during tetrapod evolution?



### COMPARING FOSSIL FORMS

16. \_\_\_\_\_ and \_\_\_\_\_ are fossil species that have characteristics unique to fish as well as characteristics found in fish and tetrapods. Describe the characteristics of lobe-finned fish that are similar to those of tetrapods.
  
17. Which lobe-finned fish is alive today? \_\_\_\_\_
  
18. Acanthostega and Ichthyostega have been called fish-like tetrapods. Explain why they are described as such and describe the environment in which they probably lived.
  
19. Why is Tiktaalik such an important transitional fossil?
  
  
  
  
  
  
  
  
  
  
20. \_\_\_\_\_ and \_\_\_\_\_ are early tetrapods that do not have features unique to fish. Describe how these two species differ anatomically and what that means about where they each lived.