**Active Learning Exercise 10.1**

to accompany

*Vertebrate Life*, Tenth Edition

Pough • Janis

**A Fossil Update to the Transition from Fish to Tetrapods**

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**Source:** This activity is based on the following paper:

Ahlberg, P. E., and J. A. Clack. 2006. Palaeontology: A firm step from water to land. *Nature* 440: 747–749. doi:10.1038/440747a

**Level of Difficulty:** Difficult

**Relevant Terminology:** transitional form, outgroup, crown group, cladogram, derived characteristics

**Activity**

**Part I**

Answer the following three questions based on reading the paper above.

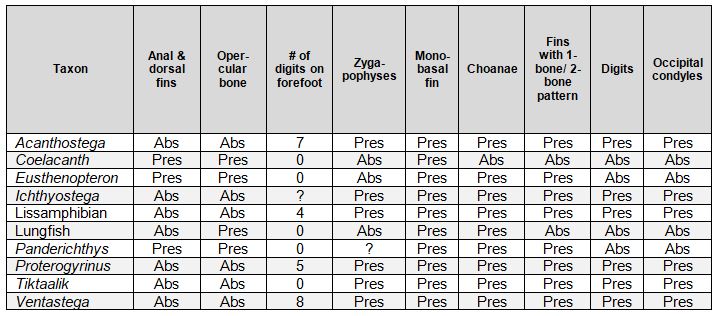
1. In the discussion of why *Tiktaalik* is important, this editorial suggests that it demonstrates the predictive capacity of paleontology. What does that mean and how does *Tiktaalik* do that?

2. What specific traits make *Tiktaalik* a “transitional form”? Explain.

3. Suppose you are a paleontologist specializing in the transition from fish to tetrapods. Obviously *Tiktaalik* was a big deal and you want to find the next big deal. What are a few specific traits you’re looking for in the next important fish → tetrapod animal to advance what’s now known about this process? In which geologic time periods will you look?

**Part II**

This table shows the states of nine morphological characters for a variety of sarcopterygian fishes.



1. Use coelacanths as the ancestral outgroup and lissamphibians as the crown group to determine the phylogenetic position of the intervening species. Draw a simplified cladogram based on textbook Figure 10.2 and indicate the appearance of derived characters.

2. Estimate the approximate date (mya) of the major extant group branches on your cladogram.

3. For each of those branches, indicate a derived characteristic or two that identifies it.

**Additional Resource/Link**

Meet *Tiktaalik roseae*: An Extraordinary Fossil Fish

<http://tiktaalik.uchicago.edu/meetTik2.html>