

Teacher Guide to the Discovery of *Tiktaalik roseae*

This activity uses the recent (2004) discovery of *Tiktaalik roseae* to teach about the fossil record and scientific inquiry. In this assignment, students will gain experience in reading scientific journals and writing about scientific concepts in an entertaining way. Using this research paper alternative eliminates the risk of plagiarism and provides students with an opportunity to transform a potentially dry topic into a creative writing opportunity while still learning and conveying scientific information. Teachers may opt to assign this project as an independent learning project or as a teacher guided, inquiry-based lesson depending on the level of their students.

Options for Differentiating Instruction:

1. Several resources regarding the discovery of *Tiktaalik roseae* have been listed. These resources span various reading levels and therefore can be used to differentiate instruction within a class and/or between levels.
2. Teachers may opt to assign this project as an independent learning project or as a teacher guided, inquiry-based lesson depending on the level of their students. In either case, it is recommended that teachers allow class time for students to complete the guiding activities listed below.
3. The number of facts presented and vocabulary terms used in assessing this project (See Grading Criteria WS) can be modified to provide more options for differentiating instruction.

Prior to completing this project, I would encourage teachers to complete the following guiding activities as they introduce students to fossils, reinforce concepts related to scientific inquiry and provide basic background information on the discovery of *Tiktaalik roseae*

Guiding Activities:

- I. The Great Fossil Find. This inquiry-based activity is a great hook to begin an Evolution Unit. It takes students on a “paper” fossil expedition. Groups are gradually given fossils from an animal skeleton and they work collaboratively to develop several hypotheses about the organism they’ve discovered as they proceed through the activity. It contains teacher resources and student handouts. <http://www.indiana.edu/~ensiweb/lessons/gff.pdf.html>
- II. Using the illustration of the lineage leading to modern tetrapods found in Nature (April 6, 2006, page 747), students will:
 - Be introduced to the concept of phylogenetic trees. (Have students describe what is being shown in the illustration.)
 - Speculate as to what type of organism *Tiktaalik* was, where it might have lived, what changes to the environment may have caused these traits to be selected for more so than those found in the ancestral species of *Panderichthys* and *Eustenopteron* from which it derived, etc.

- III. View the University of Chicago Video Clip that discusses the discovery of *Tiktaalik*.

Basick, Renee. "*Tiktaalik roseae*: Bridging the Gap between Fish and Land Animals." (Web Video) The University of Chicago News Office. April 5, 2006. The Chicago Media Initiatives. 17 Jul 2006
<http://www-news.uchicago.edu/releases/06/060405.tiktaalik-video.shtml>

MSNBC also has an 8-minute video on *Tiktaalik*'s discovery and evolution in general in which Bill Nye is interviewed. Internet Explorer is required to view the video.

"Fossil shows how fish made the leap to land." (Video) MSNBC. April 7, 2006. 17 Jul 2006. <<http://www.msnbc.msn.com/id/12168265>>

- IV. Peers edit journal entries and have students self-assess before submitting their final products.
- V. Once students have submitted their journal entries, you may opt to play "Devonian Blues." It is a song written by Ray Troll about the discovery of *Tiktaalik roseae* and can be found at his "Troll Art Website."

Troll, Ray. "Devonian Blues." Song. 2005
<<http://www.trollart.com/sound/devonianblues/index.html>>