**Active Learning Exercise 5.1**

to accompany

*Vertebrate Life*, Tenth Edition

Pough • Janis

**Earth and the Vertebrates through Time**

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**Source:** HHMI BioInteractive website (see link below)

**Level of Difficulty:** Medium

**Relevant Terminology:** mass extinction, era, period, epoch, continental drift, climate

**Introduction**

The Howard Hughes Medical Institute site has an app called “EarthViewer” that provides all manner of information about Earth over time, as is described in Chapter 5 (and also Chapters 13 and 23).

**Link**

<http://www.hhmi.org/biointeractive/earthviewer-online-and-downloadable-version>

**Activity**

Go to the EarthViewer app at the link above. You can download it or use it online, but the online version has more features and is preferable. You can also refer to Chapter 5 in your textbook.

1. Using Figure 10.1 (provided below) as your starting timeline, plot the following data through time, on the figure:

* Oxygen levels
* Carbon dioxide levels

2. These data are plotted for you under Charts on the bottom of the app page. You do not need to plot them again necessarily, but note the patterns of each through time:

* Surface temperature
* Luminosity (*What is this and why might it matter to vertebrates?*)
* Day length
* Biodiversity of marine bivalves (*How does this relate to vertebrates?*)

3. Indicate the following on the figure:

* Mass extinction events
* Major diversifications of vertebrates (or other flora or fauna that seem relevant)

4. For each era, sketch or describe the approximate positions of the continents on Earth.

5. You’ve now collected all these data in one place. Describe any patterns you see.

* What happened where? When? Why?

6. In particular, consider the diversifications of vertebrates.Write a few paragraphs explaining why you think these happened when and where they did.

