Fossil Worksheet

The Rock Record

1. Describe the law of superposition: ________________________________
   
   ________________________________________________________________

2. Using the law of superposition, which rock layer in this picture is the
   oldest? ______________  Youngest? ______________________

3. What happened to the climate in this area over time? (Look at the fossils
   as the layers get younger and think about where these fossils might have
   lived)

4. Describe the law of cross-cutting relationships: ________________________________
   
   ________________________________________________________________

5. Look at the picture to the right. Using what you know about the law of cross-
   cutting relationships, put the following steps in order as they likely happened based
   on what you can tell in this picture
   _______A pluton of lava (a “dike”) pushed through the layers
   _______The layers were all flat
   _______An Earthquake happened and a fault appeared that “offset” the layers

   What is an unconformity? ____________________________________________

THE FOSSIL RECORD

What is a fossil?__________________________________________________________

What is an index fossil?__________________________________________________

Define correlation. ______________________________________________________
Correlating Rock Layers using Index Fossils

Geologists try to match similar rock layers in different locations to see if they formed at the same time or under the same conditions. This process is called rock “correlation.” Sometimes the rock type will match but not always. Remember that sometimes erosion can remove layers that used to be there and then more layers can be deposited on top of the eroded layer.

A squiggly line represents an “unconformity” which means erosion.

Absolute dating techniques show that this fossil is 4 million years old.

Limestone
Shale
Sandstone

Section 1

1. Draw arrows to connect the matching rock layers by their fossils. (not all layers will have a match)

2. Which section is older? __________________

3. An “unconformity” exists between two layers in the first section. What is one possible reason that the unconformity appears only in the first section and not the second section? ________________________________

4. How old do you think the fossil that is shaped like a bullet in the 2nd layer of the 2nd section is based on the age of the rocks around it? ______________________________

5. The fossil that is a wing-shaped clam (on the bottom layer of the first section) is found in sandstone in the first layer and limestone in the second layer. What is one possible explanation for why they are not found in the same type of rock. ________________________________
Interpreting Fossil abundance on a graph

1. Which animal was there the most species of during the Cenozoic?

2. Which animal was there the most species of during the end of the Devonian (which is at the top of the Devonian section)?

3. Of the animals on this graph, which one was the first to exist?

4. Which animal/s are now extinct?

5. Which animals have survived the longest?

6. What time period had the most species alive? __________

7. Which animal species lived for the shortest amount of time?

8. Which time periods only had one species of animals present?

9. Let’s say you want to find a fossil of a ray-finned fish. In the picture of rock layers below, which rock “formation” or “member” would be the best for you to start digging in?

10. What is the first formation or member would you be able to find jawless fishes in?
**Properties of an Index Fossil**

Index fossils are used to determine the relative age of rocks. The best index fossils are of organisms that **existed for a very brief time** but are **found over a large (widespread) area** of Earth. In a sequence of rock layers, an index fossil would not be found in very many layers vertically but would be widespread horizontally from one place to another. It is likely that a long time from now, humans will be an excellent index fossil. Humans have existed for a relatively short time, yet our remains and signs of our existence can be found worldwide.

The following diagrams represent the **rock layers and fossils found at four widely separated areas** of exposed rock layers.

1. Describe two characteristics of an index fossil: (found in reading above)
   a. 
   b. 

2. Which fossil is the best index fossil?
   a.  
   b.  
   c.  
   d.  

3. Explain why you chose that fossil for number 2?

4. Based on the types of fossils above, in what type of environment/habitat were the rocks deposited in?

5. If you know if the fossil is 40 million years old and fossils were found in the fossil record from 50 million years ago to 10 million years ago, how old do you think the fossil could be?

6. Why would humans be a good index fossil?