Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Activity 6: Evidence from the Fossil Record**

**Directions: Read pages 446-453 in your SEPUP Biology textbook and answer the following questions in complete sentences on a separate sheet of paper.**

**Introduction**

1. **What is the fossil record?**
2. **What types of structures may be fossils?**
3. **How are fossils formed?**
4. **What do paleontologists do for a living?**
5. **The structures and ages of fossils provide evidence for macroevolution, which is…?**

**Challenge Question: How do scientists interpret evidence in the fossil record?**

**Reading**

1. **What 2 methods do scientists use to determine the age of the earth and the ages of rock layers and the fossils they contain?**
2. **Define Stratigraphy.**
3. **How does most sediment form?**
4. **Define Strata.**
5. **What is Stratigraphy based on?**
6. **How does the geologic timeline divide geologic time into periods?**
7. **Define Stratigraphic Dating.**
8. **Give 2 examples of why interpreting stratigraphy requires an understanding of geology.**
9. **Define Radiometric dating.**
10. **What is radiometric dating based on?**
11. **How much Carbon-14 is left in an organism after it has decayed for 5,730 years?**
12. **Measuring carbon-14 is accurate in determining dates up to how many years? Why?**
13. **What other isotopes do scientists work with to determine dates for older samples?**
14. **Complete the following table**

**Atomic Half-lives and Radiometric Dating**

|  |  |  |
| --- | --- | --- |
| **Radioactive Element** | **Half-Life (Years)** | **Useful Range (Years)** |
| **Carbon-14** |  |  |
| **Potassium-40** |  |  |
| **Uranium-238** |  |  |

1. **How does information from radioactive data help to determine the age of a fossil?**
2. **What are terrestrial tetrapods?**
3. **What did paleontologist Edward Cope propose in the late 19th century?**
4. **What present day organisms are tetrapods related to?**
5. **Until 1987, the fossil evidence was based on two forms, *Eusthenopteron* and *Ichthyyostega*. Were these organisms similar to the fishes we think of today like trout and tuna?**
6. **What did scientist discover about these fleshy-finned forms? Who and what did they resemble?**
7. ***Acanthostega,* discovered in East Greenland in 1987 had legs and feet but it lacked other body parts associated with life on land. These along with other characteristics suggest what about this organism?**
8. **Where do scientists think that *Acanthostega* and organism like it evolve? What period did these organisms evolve?**
9. **What did these features allow this organism to do?**
10. **Define Co-opted features.**
11. **How did *Acanthostega* change scientists’ thinking about the evolution of tetrapods?**
12. **In 2006 a team of scientists discovered a 375-million year old species know as *Tiktaalik*, what was it about this species that was important for understanding evolution that ultimately earned it the nickname, “the fishapod”?**
13. **What are transitional fossils?**
14. **Identify the reasons as to why scientists feel that some transitional fossils will never be found.**
15. **Define Transitional Features.**
16. **By studying transitional features, what does it allow scientists to do?**