Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_

**History of Life Worksheet (CH12)**

**True and False**

\_\_\_\_ 1. Earth is thought to have formed about 4.6 billion years ago.

\_\_\_\_ 2. The conditions on primitive Earth were **very suitable** for life.

\_\_\_\_ 3. By the end of the Mesozoic, the continents took on their modern shape.

\_\_\_\_ 4. The first organisms appeared on land between 3.9 and 3.4 billion years ago.

**Answer the following questions:**

5.What is the fossilization?

6. What evidence does the fossil record provide?

7. What are the two techniques paleontologists use to determine the age of fossils?

8. Explain how relative dating works.

9. What is the limitation of relative dating?

10. What dating technique is often used by paleontologists to determine the specific age of a fossil?

11. How do scientists use this dating technique to determine the ages of rocks or fossils?

13. Species that died out are said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. Explain the relationship between radioactive decay and half-life.

15. During which era did dinosaurs evolve and become extinct?

16. During which era did reptiles (not dinosaurs) first evolve?

17. During which era did modern man evolve?

18. During which era did Pangaea break apart?

19. During which era did life first evolve?

20. During which era did flowering plants first evolve?

21. During which era did the first amphibians evolve?

22. When performing radioactive dating, scientists measure the

a. number of protons and neutrons in the nucleus of a radioactive isotope.

b. amount of a particular radioactive isotope contained in a material.

c. age of a living organism that is exposed to radioactive isotopes.

d. rate at which the mass of an object decreases over time.

**23. Circle the letter of each sentence that is true about life in the Precambrian.**

a. Anaerobic and photosynthetic forms of life appeared.

b. Aerobic forms of life evolved, and eukaryotes appeared.

c. Multicellular life-forms evolved.

d. Life existed on the land and in the sea.

**24. Circle the letter of each sentence that is true about the Cambrian Period.**

a. Organisms with hard parts first appeared.

b. Most animal phyla first evolved.

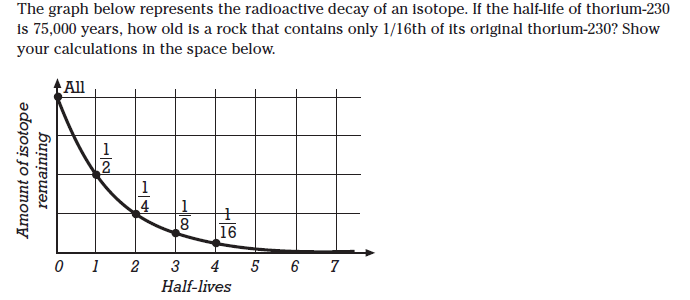
c. Many animals lived on the land.

d. Trilobites were common in the oceans.

25. Oxygen was added to Earth’s atmosphere by the process of

a. macroevolution. b. coevolution. c. endosymbiosis. d. photosynthesis

26. Dinosaurs were dominant during the

a. Precambrian b. Mesozoic Era c. Paleozoic Era d. Cenozoic Era

27. The graph below represents the radioactive decay of an isotope. If the half-life of thorium-230 is 75,000 years, how old is a rock that contains only 1/16 of its original thorium-230? Show your calculations in the space provided.

|  |  |  |
| --- | --- | --- |
| **Half-life** | **Amount of Carbon 14 Remaining** | **Amount of Nitrogen 14** |
| **0** | **100%** | **0%** |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |

28. Fill in the chart below using Carbon 14, half-life of 5730 years, as it decays to Nitrogen 14.

**Show your work for each of these problems.**

29. An animal carcass had 24 grams of Carbon 14 when 30. You find a fossil and use Carbon14

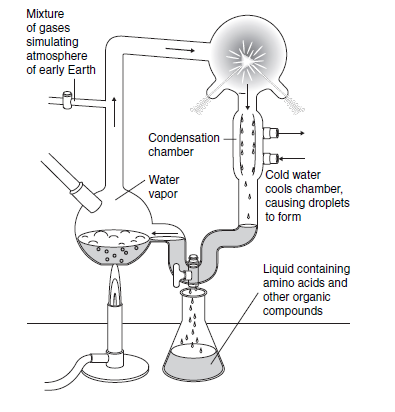
it was alive and 3 grams present when its fossilized dating to determine its age. You find

remains were discovered. How old is the fossil? 12.5 grams of Carbon 14 and 87.5 grams

of Nitrogen 14. How old is the fossil?

**31. Complete the table by checking the correct column for each statement.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Era** | | |
| **Statement** | **Pre-Cambrian** | **Paleozoic** | **Mesozoic** | **Cenozoic** |
| The first photosynthetic bacteria form dome-shaped structures called stromatolites. |  |  |  |  |
| Primates evolve and diversify. |  |  |  |  |
| Life begins to evolve. |  |  |  |  |
| Divided into three periods: Triassic, Jurassic, and Cretaceous. |  |  |  |  |
| An explosion of life, characterized by the appearance of many types of invertebrates and plant phyla |  |  |  |  |
| Mammals appear. |  |  |  |  |
| The ancestors of modern birds evolve. |  |  |  |  |
| Amphibians and reptiles appear. |  |  |  |  |
| Dinosaurs evolve and become extinct. |  |  |  |  |
| Humans evolve. |  |  |  |  |
| Pangea breaks apart. |  |  |  |  |
| The largest extinction ever took place at the end of this era. |  |  |  |  |
| First invertebrates evolve. |  |  |  |  |
| First vertebrates evolve. |  |  |  |  |



**3. Label the diagram to show which part of Miller and Urey’s apparatus simulated lightning storms on early Earth, where the amino acids would have been found, and where water was boiled to make water vapor.**

**sparks simulate lightening**

**4. List the 5 components of Earth’s early atmosphere.**

**a.**

**water boiled**

**b.**

**c.**

**d.**

**amino acids in flask**

**e.**

**5. Circle the letter of each sentence that is true about Miller and Urey’s experiments.**

a. Their purpose was to determine how the first organic molecules evolved.

b. The experiment led to the formation of several amino acids.

c. They accurately simulated conditions in Earth’s early atmosphere.

d. The results were never duplicated by other scientists in their experiments.

6. Researchers using the technique of Miller and Urey have been able to produce

a. amino acids and sugars. b. ATP and mitochondria.

c. proteins and DNA. d. cells membranes and simple cells.

7. Define Biogenesis living organisms come from other living organisms

8. Define Spontaneous Generation life comes from non-living materials

**Answer the following questions:**

9. What change occurred in Earth’s atmosphere after the evolution of photosynthesizing prokaryotes (bacteria)? Why? Oxygen became part of the atmosphere because oxygen is the product of photosynthesis

10. Fill in the steps below to show the evolution of eukaryotic cells using the words below.

eukaryotic cell protocell prokaryotic cell

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11. What does the endosymbiotic theory propose

Ingredients