Name:

Date: Period:

**Lesson 1.2: True or False**

Write true if the statement is true or false if the statement is false.

\_\_\_\_\_ 1. Wegener thought that the continents were still drifting together to form the supercontinent Pangaea.

\_\_\_\_\_ 2. Wegener’s hypothesis became widely accepted by other scientists only after he died.

\_\_\_\_\_ 3. Wegener offered a detailed explanation for continental drift.

\_\_\_\_\_ 4. The Rocky Mountains and mountains in eastern Greenland were once part of the same mountain range.

\_\_\_\_\_ 5. Evidence for continental drift from magnetic polarity was discovered in the 1950s.

\_\_\_\_\_ 6. Magnetite crystals in rocks always point to today’s magnetic north pole.

\_\_\_\_\_ 7. The present continents look as though they fit together like puzzle pieces.

\_\_\_\_\_ 8. Evidence for ancient glaciers in currently tropical areas can be explained by continental drift.

\_\_\_\_\_ 9. Wegener’s hypothesis explains how continents can plough through solid oceanic crust.

\_\_\_\_\_ 10. During the time of Pangaea, there were two magnetic north poles.

**Lesson 1.2: Critical Reading**

Read the passage below based on the text and answer the questions that follow.

**Evidence for Continental Drift: Magnetic Polarity**

New evidence for magnetic drift was discovered in the 1950s from studies of Earth’s magnetic history. Earth has a magnetic field like that of a bar magnet, with magnetic north and south poles. The magnetic poles are located near the geographic poles. In the 1950s, scientists studied the magnetic properties of rocks that formed at different times and in different places. They used magnetometers, which are devices that measure magnetic field direction and intensity. Why study rocks? Rocks containing the mineral magnetite have crystals that align with Earth’s magnetic field. Magnetite crystals are like tiny magnets that point to the north magnetic pole as they crystallize from magma. Once the crystals form, their magnetic alignment, or polarity, is locked in place. Therefore, the alignment of crystals in rocks records the direction of Earth’s magnetic field at the time the rocks formed. Scientists studying the magnetic polarity of rocks compared rocks that formed at different times and places. They made several important observations:

* Young rocks are aligned with Earth’s current magnetic north pole regardless of the continent on which they formed.
* Old rocks of about the same age that formed on the same continent have the same magnetic field alignment, but it is different from Earth’s current magnetic alignment.
* Old rocks of different ages, regardless of where they formed, are not aligned with each other or with Earth’s current magnetic field.

How could these observations be explained? One possible explanation is that the locations of Earth’s magnetic poles have changed their positions through time. However, to fit all the data, this explanation would require that Earth have had two magnetic north poles in the past. Another possible explanation—and one that is better supported by the data—is that the continents, and not the magnetic poles, have changed their positions through time. The magnetic polarity evidence supports the continental drift hypothesis. When the evidence was first discovered, it stimulated research to understand how continents can move over Earth’s surface.

**Questions**

1. Describe Earth’s magnetic field.

2. Why are rocks useful for studying Earth’s magnetic history?

3. What observations did scientists make in the 1950s about the magnetic polarity of rocks?

4. How did the observations in question 3 support the continental drift hypothesis?

**Lesson 1.2: Multiple Choice**

Circle the letter(s) of the correct choice(s). Some questions may have more than one answer.

1. Evidence for continental drift includes

1. identical rocks located on both sides of the Atlantic Ocean.
2. similar mountain ranges found on both sides of North America.
3. fossils of different organisms discovered on the same continent.
4. ancient coal seams found in areas that are currently in the tropics.

2. Evidence of ancient glaciers supports Wegener’s hypothesis because the evidence has been found on continents that are

 currently

1. much colder than they used to be.
2. located near the north pole.
3. very close to the equator.
4. covered by glaciers.

3. Earth is like a giant magnet with its north pole near the

1. geographic north pole.
2. center of Africa.
3. Grand Canyon.
4. equator.

4. Magnetite crystals always record the direction and strength of Earth’s magnetic field at the

1. present time.
2. time of Pangaea.
3. time Earth formed.
4. time they crystallized.

5. When scientists first observed that differently aged rocks have different magnetic polarities, they proposed several

 possible explanations. Which of the following explanations did they propose?

1. The continents remained fixed in place and the north magnetic pole moved.
2. The north magnetic pole remained fixed in place and the continents moved.
3. Both the continents and the north magnetic pole remained fixed in place.

6. Why did other scientists not accept Wegener’s hypothesis at first?

1. There were no geologists at that time.
2. There was no evidence for the hypothesis.
3. There was no known explanation for the hypothesis.

7. Which type of evidence convinced most scientists that the continents have drifted?

1. magnetic polarity of ancient rocks containing magnetite.
2. ancient maps showing the shape and location of Pangaea.
3. current observations of the magnetic north pole wandering.
4. coral reefs located in areas that are very warm today.

**Lesson 1.2: Matching**

Match each definition with the correct term.

|  |  |
| --- | --- |
| **Definitions**\_\_\_\_\_ 1. mineral with crystals that are like tiny magnets\_\_\_\_\_ 2. direction of a magnetic field\_\_\_\_\_ 3. hypothesis that continents moved to their present positions over many millions of  years\_\_\_\_\_ 4. area over which a magnet exerts force\_\_\_\_\_ 5. supercontinent that existed 250 million years ago\_\_\_\_\_ 6. how Earth’s north magnetic pole seems to have moved but actually has not\_\_\_\_\_ 7. scientist who proposed that the continents have drifted | **Terms**1. Pangaea
2. continental drift
3. magnetic polarity
4. Wegener
5. magnetic field
6. magnetite
7. apparent polar wander
 |

**Lesson 1.2: Fill in the Blank**

Fill in the blank with the appropriate term.

1. A device that can measure magnetic field intensity is called a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. As magnetite crystals form from magma, they align with Earth’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. The continental drift hypothesis was first proposed in the early \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ century.

4. Earth’s current magnetic north pole is located in northern \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

5. Eastern South America and western \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ were once joined together as part of Pangaea.

6. Scientists explain apparent polar wander by assuming that the continents have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

7. Most other scientists initially \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the hypothesis of continental drift.

**Lesson 1.2: Critical Writing**

Thoroughly answer the writing prompt below. Use appropriate academic vocabulary and clear and complete sentences.

***Prompt:*** Identify and explain evidence that Wegener collected to support his continental drift hypothesis.