Sixth Grade “Plate Tectonics” Assessments

1a. What is the best term to describe Earth's surface?
- a. static and unchanging; it stays in one place
- b. dynamic; it is in constant movement

1b. The term "plate tectonics" is an area of science that deals with:
- a. the constant movement of the Earth's surface
- b. the movement of Earth and the other rocky inner planets in space
- c. a method of coating metals with other metals and substances
- d. the movement of electrons through metals

1c. Distinguish between a static and a dynamic system. Which term would describe Earth's surface? Why?

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2a. How were the inner planets, including Earth, originally formed?
- a. After the sun was formed, the other matter around it formed and cooled, creating the planets
- b. The sun blew off parts of itself once it got hot enough and made the planets

2b. State how the inner planets, including Earth, were formed.

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2c. How would you test the theory that the planets in the solar system were formed from the coalescing and cooling of the same matter as the sun, following its formation?

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3a. What was the name of the original "supercontinent" that dived and spread into the continents we know today?
- a. Pacific
- b. Pangea

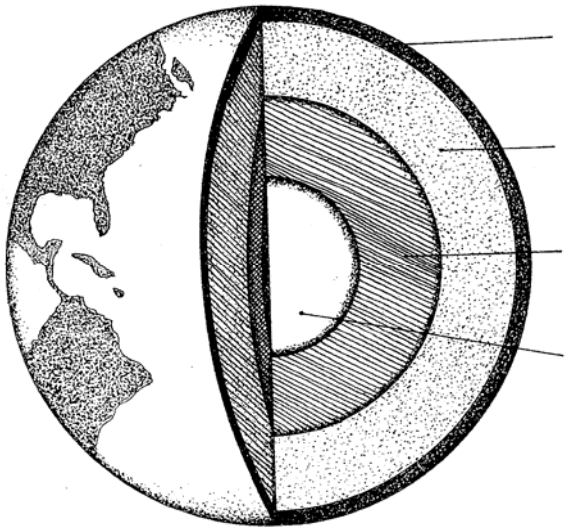
3b. The massive supercontinent that scientists believe existed in the past was given what name?

a. Portugal
b. Pangaea
c. Bob
d. Asia

3c. Identify the nature of Earth's continents shortly after the crust cooled and solidified. Is there a name for this original state or configuration of the land?

_____
_____
_____
_____

4a. Label the four primary layers of the Earth.



4b. Match the following terms with their descriptions.

Crust	solid iron and nickel, 800 miles thick, about 7000°C
Mantle	liquid iron and nickel
Outer Core	1,800 mi. thick, rock of middle density, moves very slowly
Inner Core	surface layer of mainly basalt or granite, 5-25 mi. thick

4c. Identify the four primary layers of the Earth, including their approximate depth and composition.

_____
_____
_____
_____
_____

5a. What force causes Earth's crustal plates to move?

a. wind
b. ocean waves
c. currents in the layers under the crust

5b. Explain how convection currents cause the tectonic plates to move.

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_____
_____
_____

5c. Identify the forces at work in plate movement. Give another example of where such forces are also at work.

_____
_____
_____
_____

6a. About how fast do the plates move in a year?

a. 1-4 miles
b. 1-4 inches

6b. Tectonic plates move about _____ inches each year.

6c. The relative motion of tectonic plates occurs at about the same rate as:

a. Water falling
b. A growing fingernail
c. Ice forming at 32º
d. The rotation of the Earth

7a. What can happen when a transform fault suddenly releases its energy?

a. an earthquake
b. a volcano
c. a hurricane
d. an avalanche

7b. Explain the most common cause of an earthquake in terms of its relationship to a transform fault.

_____
_____
_____

7c. Tell what happens when a transform fault releases stored energy.

_____
_____
_____

8a. Earthquakes release energy at the focus, below ground where the earthquake actually happens, and at the _____, the spot on the surface above the focus.
a. ground
b. fault
c. epicenter

8b. What is the difference between the focus and the epicenter of an earthquake?
_____
_____
_____

8c. What are the two areas where earthquakes release their energy waves and where do these occur?
_____
_____
_____

9a. The _____ scale measures the magnitude of an earthquake.
a. diatonic
b. Richter
c. rating
d. Fujita

9b. On what scale is the magnitude of an earthquake measured?
_____
_____
_____

9c. What is the function of the Richter Scale?
_____
_____
_____

10a. Most volcanoes form over subduction zones. However, some form over “hot spots” that can cause chains of volcanoes and islands as plates move over them. Which islands are examples of this?
_____

10b. What are the two primary causes of volcanoes?
a. Convection currents and weather
b. Earthquakes and tides
c. Earth’s rotation and tilt
d. Subduction zones and hot spots

10c. The Hawaiian Islands are volcanic, but were not formed over a subduction zone. Explain how they were formed.

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_____
_____

11a. Which of the following is not evidence for Plate Tectonic Theory?
Matching rock types on different continents, fit of the continents, location of earthquakes, mid-ocean ridges, similar weather in different parts of the world.

11b. Name two pieces of evidence supporting the Plate Tectonics Theory.

_____
_____
_____

11c. Name three pieces of evidence supporting the Plate Tectonics Theory.

_____
_____
_____

12a. The theory that all land was once joined and drifted to its present locations was first developed by which German scientist?

a. Alfred Wegener
b. Alfred Einstein
c. Gerhardt Ueblocker
d. Werner Klemperer

12b. Who was the German scientist who first developed the theory that all land was once joined and drifted to its present locations?

_____

12c. State the key idea developed by German scientist Alfred Wegener

_____
_____
_____
_____

The following Colorado Model Content Standards are addressed in this assessment by the questions indicated:

Questions 9a, 9b, 9c: Standard 5-8 2.2a (measuring quantities associated with energy)

Questions 3a, 3b, 3c, 5a, 5b, 5c, 7a, 7b, 7c, 8a, 8b, 8c, 9a, 9b, 9c, 10a, 10b, 10c, 11a, 11b, 11c: Standard 5-8 2.3a (identifying and classifying factors causing change within a system)

Questions 11a, 11b, 11c: Standard 5-8 4.1b (explaining how fossils are formed and used as evidence to indicate that life has changed through time)

Questions 1a, 1b, 1c, 3a, 3b, 3c, 5a, 5b, 5c, 6a, 6b, 6c, 7a, 7b, 7c, 10a, 10b, 10c, 11a, 11b, 11c: Standard 5-8 4.1c (natural processes that shape Earth's surface)

Questions 5a, 5b, 5c, 7a, 7b, 7c, 8a, 8b, 8c, 10a, 10b, 10c, 11a, 11b, 11c: Standard 5-8 4.1d (explaining the distribution and causes of natural events)

Questions 10a, 10b, 10c, 11a, 11b, 11c: Standard 5-8 4.3c (describing the composition and physical characteristics of oceans)

Questions 2a, 2b, 2c, 4a, 4b, 4c: Standard 5-8 4.4a (describing the basic components, composition, size, and theories of origin of the solar system)

Questions 2a, 2b, 2c: Standard 5-8 4.4c (comparing Earth to other planets)

Questions 12a, 12b, 12c: Standard 5-8 6c (describing contributions to the advancement of science made by people in different cultures and at different times in history)

Answer Key

1a. b. dynamic; it is in constant movement

1b. a. the constant movement of the Earth's surface

1c. Acceptable answers could include:
-a static system is unchanging and it stays in place
-a dynamic system is in constant movement, which better describes the geologic activity of Earth

2a. a. After the sun was formed, the other matter around it formed and cooled, creating the planets

2b. After the sun was formed, the other matter around it formed and cooled, creating the planets

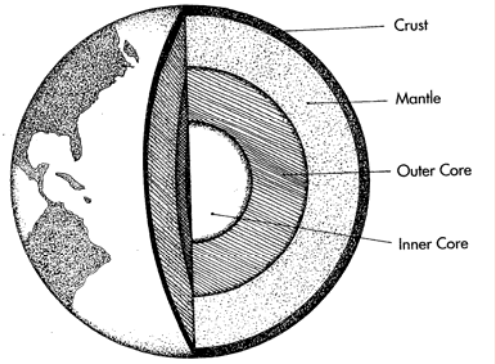
2c. Acceptable answers could include:
-observations of similar systems
-laboratory modeling
-analysis of the composition of the bodies in question

3a. b. Pangea

3b. b. Pangea

3c. A single supercontinent now called Pangea

4a.



4b.

Crust	solid iron and nickel, 800 miles thick, about 7000°C
Mantle	liquid iron and nickel
Outer Core	1,800 mi. thick, rock of middle density, moves very slowly
Inner Core	surface layer of mainly basalt or granite, 5-25 mi. thick

4c.

Crust	surface layer of mainly basalt or granite 5-25 mi. thick
Mantle	1,800 mi. thick, rock of middle density, moves very slowly
Inner Core	liquid iron and nickel
Outer Core	solid iron and nickel, 800 miles thick, about 7000°C

5a. c. currents in the layers under the crust

5b. Acceptable answers could include:
-Uneven heating of the mantle causes convection currents to form.
-Plates move atop these currents.

5c. Acceptable answers could include:
-Uneven heating of the mantle causes convection currents to form.
-Plates move atop these currents.
-Other examples of convection currents might include boiling water, ocean currents, wind and weather, etc.

6a. b. 1-4 inches
6b. 1-4
6c. b. A growing fingernail

7a. a. an earthquake
7b. an earthquake
7c. Acceptable answers could include:
-Pressure builds along a transform plate boundary until it can no longer remain fixed, and the fault slips, releasing massive amounts of energy along the fault.

8a. b. fault
8b. Acceptable answers could include:
-the focus is the point below ground where the earthquake actually happens, while the epicenter is the spot on the surface directly above the focus

8c. Acceptable answers could include:
-Energy is released first at the focus, the point below ground where the earthquake actually happens. Energy then travels to the epicenter directly above the focus and is transferred through the crust.

9a. b. Richter
9b. The Richter Scale
9c. Acceptable answers could include:
-To measure the magnitude of an earthquake – the amount and scope of the energy released.

10a. Hawaiian Islands
10b. d. Subduction zones and hot spots
10c. Acceptable answers could include:
-Crustal plates move over a hot spot, a vent where magma reaches the surface. As the plate sticks and shifts, magma pools and builds volcanic islands such as Hawaii.

11a. similar weather in different parts of the world
11b. Acceptable answers could include any two:
-matching rock types on different continents
-fit of the continents, location of earthquakes and volcanoes
-mid-ocean ridges
-similar fossil types found on formerly joined coastlines

-dating of rocks along the sea floor
-magnetic signatures of rocks

11c. Acceptable answers could include any three:
-matching rock types on different continents
-fit of the continents, location of earthquakes and volcanoes
-mid-ocean ridges
-similar fossil types found on formerly joined coastlines
-dating of rocks along the sea floor
-magnetic signatures of rocks

12a. a. Alfred Wegener

12b. Alfred Wegener

12c. Acceptable answers could include:
-All land was once joined and drifted to its present locations over a long period of time.