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

**Chapter 9: Changes to the Earth’s Surface**

**Vocabulary**

On the Earth’s surface, forces such as wind, ice, waves, and running water interact to cause erosion and deposition. Within the Earth, forces resulting from plate movements interact to change Earth through earthquakes, volcanoes, and mountain building processes.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a natural landshape or feature.

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is all of the landforms in a certain area.

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a large, thick sheet of ice.

4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is a small hill that is made and shaped by the wind.

5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an area of new land at the mouth of a river.

6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a large hole that is formed when the roof of a cave collapses.

7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a section of Earth’s crust and mantle that fits together with other sections, like a puzzle.

8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is a movement of the ground, caused by a sudden release of energy in Earth’s crust.

9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is the point on Earth’s surface directly above the focus of an earthquake.

10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a break in the Earth’s crust.

11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is molten (melted) rock below the Earth’s surface.

12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the molten rock that reaches Earth’s surface.

13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a mountain made of lave, ash, and other materials from eruptions that occur at an opening in the Earth’s crust.

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

**Chapter 9: Changes to the Earth’s Surface**

**Lesson 1: What Are Some of Earth’s Landforms?**

**Standards: 5.1.B.a., and 5.1.B.b.**

1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a natural landshape, or feature (p. 272).
2. All kinds of landforms in a certain are known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 272).
3. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a landform that is much higher than the surrounding land (p. 272).
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ usually occur as individual mountains; not in ranges (p. 273).
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are landforms that are like mountains, but not as high. They also have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ slopes (p. 273).
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the difference in elevation between high and low places (p. 273).
7. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a large, flat landform with little relief (p. 273).
8. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a large, thick sheet of ice (p. 274).
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are long, low hills formed by materials carried by glaciers (p. 274).
10. Landforms produced by glaciers are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. These features form when a glacier scrapes and scratches the rock beneath it (p. 274).
11. A sand hill that is made and shaped by the wind is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 275).
12. Sand spits and barrier islands are caused by \_\_\_\_\_\_\_\_\_\_\_\_ erosion (p. 275).
13. Rivers carry sand from the land it flows through. When the river slows and the sand settles, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is created (p. 275).
14. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a tall, flat-topped rock feature (p. 276).
15. The word “mesa” is a Spanish word meaning \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 276).
16. A mesa is formed as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(p. 276).

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are deep valleys with steep sides (p. 276).
2. Sand dunes and moraines are similar because
3. Both are kinds of hills
4. Both are formed of ice
5. Both are formed by rivers

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

**Chapter 9: Changes to the Earth’s Surface**

**Lesson 2: What Causes Changes to the Earth’s Landforms?**

**Standards: 5.1.B.a., and 5.1.B.b.**

1. A rapidly flowing river erodes its banks and bottom. Eroding banks can make the river \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Erosion on the bottom can make the river \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 281).
2. Moving water carries \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ downstream. When water slows down, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is deposited (p. 281).
3. Sediment deposited on the banks make the river \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Sediment deposited on the bottom make the river \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 281).
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an important cause for change in Earth’s landforms (p. 281).
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the process of moving sediment by wind, water, or ice.
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the process of which sediment settles out of slow moving water, or is dropped by the wind.
7. What are the effects of erosion to cliffs and sinkholes cause by the waves of the ocean (p. 282).

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. How does rain cause erosion? What are its effects (p. 282)? **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Ocean waves also change landforms in another way. The gentle waves rolling into the beach wash the sand in. This a process known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 282).
2. When water slows down, it loses energy, dropping sediment to the bottom. A river often deposits sediment at its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the place where it empties into the ocean. As a result, much of the sediment is deposited, forming a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 283).
3. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an area of new land at the mouth of a river (p. 283).
4. During heavy rains, flooding sends the rising waters over its banks, depositing sediments on the land. These areas are known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 283).
5. These areas become rich in nutrients that plants need\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 283).
6. Living in a flood plain can be very dangerous because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 283).

1. Water can change not only landforms on Earth, but also underground. Ground water can weather surface rocks. Underground erosion causes caves to form. Often, the erosion and the weight of the material above the cave will cause it to collapse, causing a \_\_\_\_\_\_\_\_\_\_\_\_(p. 284).
2. Gravity can also cause land-changing processes. Gravity can cause soil, rocks, and mud to move quickly down a slope, causing a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 284).
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can happen quickly, especially during heavy rains and earthquakes (p. 284).
4. Ice can also cause erosion. One way ice causes erosion is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_freezes, expanding the ice in the cracks of the rocks, breaking it into pieces (p. 285).
5. Plants can also cause weathering and erosion. Plants can germinate, and grow its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in tiny cracks or holes in the rocks (p. 286).
6. Plants can also help prevent erosion by\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 286).

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

**Chapter 9: Changes to the Earth’s Surface**

**Lesson 3: How Do Movements of the Crust Change Earth??**

**Standards: 7.1.A.a.**

1. Earth is made up of 4 layers: the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 290).
2. The thin crust is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 290).
3. Some rock within the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is soft, like melted candy (p. 290).
4. The closer to the center of the Earth, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ it is (p. 290).
5. The outer core is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but it is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, not rock (p. 291).
6. The inner core is also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but it is solid due to the pressure (p. 291).
7. Earth’s crust and uppermost mantle are divided into sections called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 291).
8. North America, Greenland, and parts of the Atlantic Ocean are on the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate (p. 291).
9. The plates \_\_\_\_\_\_\_\_\_\_ on the softer rock of the mantle (p. 291).
10. There are \_\_\_\_ major plates; the \_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate, and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plate (p. 291).
11. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the movement of the ground released by a sudden release of energy in the Earth’s crust (p. 292).
12. The \_\_\_\_\_\_\_\_\_\_\_ is the place within the crust where energy is released during an earthquake (p. 292).
13. The greatest damage will occur directly above the \_\_\_\_\_\_\_\_\_\_ (p. 292).
14. The point of the Earth’s surface above the focus is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(p. 292).
15. Earthquake occur because of 3 different types of plate movement. They are: 1.\_\_\_\_\_\_\_\_\_\_\_\_\_; 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; and 3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 292).
16. Most earthquakes occur along a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is a break in the Earth’s surface (p. 292).
17. Earthquakes caused by plates pushing together, or sliding past each other are usually very \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 292).
18. Earthquakes caused by plates pulling apart are usually \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (p. 292).
19. Earthquakes are classified by their magnitude, which is the amount of energy released (p. 292).
20. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is used to measure the magnitude of an earthquake (p. 293).
21. An earthquake measuring \_\_\_\_\_ on the Richter scale is too small to be felt (p. 293).
22. An earthquake measuring \_\_\_\_\_, or higher on the Richter scale can cause great damage. (p. 293).
23. Each increase of \_\_\_\_ on the Richter scale is an increase of about \_\_\_\_ (p. 293).
24. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a mountain made of lava, ash, and other materials (p. 294).
25. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the melted (molten) rock beneath the Earth’s surface (p. 294).
26. \_\_\_\_\_\_\_\_\_\_ is the molten rock that reaches the surface through the vent (p. 294).
27. A \_\_\_\_\_\_\_\_\_\_\_ is an opening in the Earth’s crust in which the magma flows (p. 294).
28. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are the tallest landforms on Earth. They are formed when \_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

**Chapter 9: Changes to the Earth’s Surface**

**Study Guide**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A natural shape or feature of Earth’s surface.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A thick sheet of ice.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Molten rock beneath the Earth’s surface.
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A collapse of the roof of an underground cave.
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A movement of the ground, caused by the sudden release of energy in the Earth’s crust.
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The landform of sand and other materials deposited at the mouth of a river.
7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A sand hill formed and shaped by the wind.
8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A mountain made of lava and ash.
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is all of the different kinds of landforms in a certain place.
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A break in Earth’s crust.
11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The point on Earth’s surface directly above the focus of an earthquake.
12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Molten rock that reaches Earth’s surface.
13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A landform that is much higher than the surrounding land.
14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Like mountains, but not as high.
15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A tall, flat topped rock landform.
16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Deep valley with steep sides.
17. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The process of moving sediment by wind, water, or ice.
18. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The process of which sediment settles out of slow moving water, or is dropped by wind.
19. Earth is made up of 4 layers; the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
20. Earth’s crust and uppermost mantle are divided into sections called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
21. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Used to measure the magnitude of an earthquake.