Name _____ **Date** _____

The Changing Shape of the Land

Key Words		
beach	delta	dunes
deposition	erosion	glacier
minerals	sediment	wave
weathering	wind	

What do you think is the most destructive natural force on the Earth's surface? Do you think it might be earthquakes? Earthquakes are very powerful and can cause much destruction in just a few seconds. How about volcanoes? A volcano's explosive force can change a large area of land at one time. The answer to the question might surprise you. The most destructive force on the Earth's surface is actually a raindrop falling from the clouds. The land on the Earth's surface is constantly changing. Moving water is the driving force behind most of the changes on the Earth's surface. Water, wind, and ice can all change the shape of the land on the face of the Earth through weathering, erosion and deposition. Weathering, erosion, and deposition are natural processes that work together to change the Earth's surface.

Weathering is a process that breaks down rocks and wears down the Earth's surface. Weathering changes a rock forever. The amount of weathering that happens to rocks depends on many things. One of the things that affects weathering is the composition of the rock. Rocks are made of natural materials called **minerals.** A mineral is a solid, natural material that has a crystal form and its own unique set of properties. Different minerals weather in different ways and at different times. Another factor that affects the weathering of rocks and rocky surfaces is how long it is exposed to conditions that cause weathering. One other factor that affects weathering is the climate where the rock is located. Rocks found in places where it gets very cold or very hot weather more quickly than those in places where the temperatures are less extreme. The small pieces that break off or wear off of rocks are called **sediments.**

Rocks found in fast-moving rivers and streams will smack into each other and hit the bottom of the stream or river over and over. This causes the rocks to break up as they move along in the water. That is why most rocks that located in rivers and streams

for a period of time are smooth and rounded. **Wind** (moving air created by the uneven heating of the Earth's atmosphere by the sun) can also cause the weathering of rocks and rocky surfaces. The wind might actually pick up a small rock and then drop it, causing it to crack or break. The wind also picks up sand and other sediments. If the wind blows the sand and sediments against a rocky surface over and over, the surface can crack and break up from the force of the impacts.

As rocks and rocky surfaces are weathered and broken up into smaller and smaller pieces, the sediments might pile up to form soil. Soil is a mixture of sediments and organic matter from dead plants and animals. Other sediments might be moved to new places by wind, water, or ice. This movement of sediments is called **erosion. Deposition** is the dropping of the sediments in a new place.

Wind picks up sediments and deposits them in different places on the surface of the Earth. Sand **dunes** on a **beach** or in a desert are created as the wind blows the sand around. The dunes change from day to day and week to week as the wind changes direction and speed.

Water also moves sediments to new places. Rivers flow downhill towards the ocean. The moving water in the rivers picks up the sediments and carries them along. The closer the river gets to its mouth (or end), the slower the water flows. As the water slows, it leaves sediments behind, depositing them at the bottom of the river, along the riverbanks, or, finally, at the river's end—its mouth. The place where the river flows into an ocean or sea is called a **delta**. Water in the form of **waves** also erodes beaches, moving the sand from the beach to the lake or sea's bottom.

Glaciers, giant formations of ice, can weather and erode rock and rocky surfaces. When snow falls and strong winds blow high up in the mountains, the snow can pile up and turn into ice. The pile of ice can become so heavy that it starts to move downhill. This moving pile of ice is a glacier. A glacier moves very slowly, picking up and leaving behind sediments as they move. The heavy ice puts pressure on rocks, causing them to break. The glacier also tears pieces of rock off of rocky surfaces, making holes and valleys in the land. Weathering, erosion, and deposition are all forces that contribute to the changing landscape found on the Earth's surface. Who would have thought that a tiny raindrop could be so powerful?

1. Which of the following is a synonym for the word *deposits* in Paragraph 5?

A Picks up
B Drops
C Erodes
D Creates

2. Which of the following would BEST model the action of a glacier on the land?

A Sandpaper rubbing against wood
B Sugar dissolving in warm water
C Water changing state during the water cycle
D Ice changing the temperature of water

3. According to this passage, why can a raindrop be considered a destructive force?

A Raindrops can cause major flooding near large cities.
B Most of the Earth's surface is covered by water.
C Raindrops can change a large area of land at one time.
D Raindrops lead to weathering and erosion on the Earth's surface.

4. Which of the following is the process by which sediments are moved to a new place?

A Weathering
B Erosion
C Deposition
D Evaporation

5. Why would a flowing river drop more sediments near its mouth than at it source (beginning)?

A The sediments are heavier when they first get in the river.
B The river slows down as it nears its mouth.
C The river speeds up as it goes downhill.
D The sediments are more dissolved in the water.

6. Which of the following tells the main difference between weathering and erosion?

A Weathering is the breaking of rocks into sediments while erosion is the movement of sediments.
B Weathering only takes place where it is very cold while erosion occurs all over the Earth.
C Weathering takes a long time while erosion occurs very quickly.
D Weathering is the dropping of sediments while erosion is the movement of sediments.

Part B

A suffix can be added to a word to form a new word. The suffixes "-tion" or "-sion" mean the "act of doing something". For example, a *celebration* is the act of celebrating. Adding an "-s" or an "-es" to the end of a noun can make it plural. "Dune" is a singular noun; "dunes" is a plural noun. (Remember to change a "y" to "i" when adding "es" to the end of a word!) The suffix "-ive" means "doing some action." For example, *explosive* means the act of exploding. Read the sentences below. Add a suffix to each root word to make the correct form of the word that goes in the sentences.

7. The movement of sediments by wind, water, or ice is called _____
Root word: erode

8. The dropping of sediments in a new place is called _____
Root word: deposit

9. A _____ force is one which tears down or breaks up landforms and rocks.
Root word: destruct

10. Weathering, erosion and deposition are all _____ that change the surface of the Earth.
Root word: process

11. Every mineral has its own unique set of _____
Root word: property

12. The Earth's surface is constantly changing due to _____ from the forces of weathering, erosion, and deposition.
Root word: contribute

13. Earthquakes and volcanoes can cause a lot of _____ on the Earth's surface
Root word: destruct

14. How a rock weathers is partly determined by its _____
Root word: locate

beach	delta
dunes	deposition
erosion	glacier
minerals	sediment
wave	weathering
wind	

Vocabulary With Definitions

Beach—the sandy shoreline where the land meets the sea or lake	Delta—a large flat area of land at the mouth of a river
Dunes—hills of sand that are deposited by the wind	Deposition—the dropping of sediments in a new location
Erosion—the movement of sediments by wind, ice, or moving water	Glacier—a large body of moving ice that stays frozen all year
Mineral—a solid natural material that has a crystal form and its own set of properties	Sediments—bits of rocks, soil, sand, shells, and the remains of organisms
Wave—a repeating back-and-forth movement of water on a shoreline	Weathering—the breaking up of rocks into sediments
Wind—moving air	

Definitions Alone

the sandy shoreline where the land meets the sea or lake	a large flat area of land at the mouth of a river
hills of sand that are deposited by the wind	the dropping of sediments in a new location
the movement of sediments by wind, ice, or moving water	a large body of moving ice that stays frozen all year
a solid natural material that has a crystal form and its own set of properties	bits of rocks, soil, sand, shells, and the remains of organisms
a repeating back-and-forth movement of water on a shoreline	the breaking up of rocks into sediments
moving air	