

Wind Erosion and Deposition

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CHAPTER 1

Wind Erosion and Deposition

Lesson 10.3: True or False

Name _____ Class _____ Date _____

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

- _____ 1. Wind is a more important erosional force in humid regions.
- _____ 2. Particles transported by saltation may stay in the air for days.
- _____ 3. The wind usually transports sand-sized particles by creep.
- _____ 4. Desert pavement is a surface covered by sand.
- _____ 5. Desert pavement forms as a result of deflation.
- _____ 6. Desert varnish forms because of wind-blown clay.
- _____ 7. Beach dune sand is usually made of a variety of minerals.
- _____ 8. Desert dune sand is usually composed only of quartz.
- _____ 9. Dune sand particles are rounded because rounded grains roll more easily than angular grains.
- _____ 10. Wind drops the sediments it is transporting when it slows down.

Lesson 10.3: Critical Reading

Name _____ Class _____ Date _____

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

Sand Dunes

Deserts and seashores often have sand dunes. Sand dunes are small hills of sand deposited layer upon layer by the wind. For sand dunes to form there must be an abundant supply of sand and steady winds. A dune forms when a strong wind slows down—often when it blows over some type of obstacle, such as a rock or clump of grass—and drops its sand. As the wind moves up and over the obstacle, it increases in speed. It carries the sand grains up the upwind side of the dune by saltation. As the wind passes over the crest of the dune, its speed decreases. Sand cascades down the other side, forming the slip face of the dune. Sand dunes slope gently on the upwind side and steeply on the downwind slip face side. The slip face is steep because dry sand can form a relatively steep angle without falling downslope.

Sand in beach dunes may vary in composition depending on their location. Beach dune sand is usually composed of quartz because in humid areas other minerals weather into clays. In the tropics, they may be composed of calcium carbonate. Sand in desert dunes may be composed of a variety of minerals. There is little weathering in deserts, so less stable minerals are left behind. Although sand dunes may differ in the composition of their sand, the sand particles themselves are similar and usually very uniform in size and shape. The particles are sand-sized, because larger particles are generally too heavy for the wind to transport easily. The particles are rounded because rounded grains roll more easily than angular grains.

The type of sand dune that forms depends on the amount of sand available, the strength and direction of winds, and the type of ground over which the sand is moving. For example, crescent-shaped dunes form where a large amount of sand is available, winds blow consistently in one direction, and the ground is hard. Linear dunes form long straight lines parallel to the wind direction. They form in areas with less sand where winds come together from different directions.

Questions

1. What are sand dunes?
2. Explain how a sand dune forms.
3. Describe similarities and differences among the sands of different dunes.
4. Identify factors that affect the type of sand dune that forms. Give examples.

Lesson 10.3: Multiple Choice

Name _____ Class _____ Date _____

Circle the letter of the correct choice.

1. The ability of wind to erode sediments depends on
 - a. sediment size.
 - b. wind strength.
 - c. degree of aridity.
 - d. all of the above
2. Wind transports particles of silt and clay
 - a. by creep.
 - b. as bed load.
 - c. by saltation.
 - d. over great distances.
3. What is needed for a sand dune to form?
 - a. bare ground
 - b. plenty of sand
 - c. winds that never change direction
 - d. all of the above
4. Loess deposits form downwind of
 - a. glacial deposits.
 - b. deserts.
 - c. forests.
 - d. two of the above
5. Loess deposits
 - a. have gently sloping sides.
 - b. make very fertile soils.
 - c. form in vertical layers.
 - d. are mined for mineral ores.
6. The bed load of wind typically includes particles the size of
 - a. clay.
 - b. silt.

- c. sand.
 - d. two of the above.
7. Sand dunes form cross beds when the
- a. wind often changes direction.
 - b. slip face collapses.
 - c. particles vary in size.
 - d. obstacles keep moving.

Lesson 10.3: Matching

Name _____ Class _____ Date _____

Match each definition with the correct term.

Definitions

- _____ 1. stone that has been polished due to abrasion by wind-blown sand
- _____ 2. surface covered by gravel-sized particles that are not easily eroded by wind
- _____ 3. steep side of a sand dune
- _____ 4. lowering of the ground surface due to wind erosion of sediments
- _____ 5. small hill in a desert or on a beach formed by wind deposition of sand
- _____ 6. layers of very fine particles that have been deposited by the wind
- _____ 7. dark-colored coating that forms on exposed rocks in desert areas

Terms

- a. deflation
- b. desert pavement
- c. desert varnish
- d. loess
- e. sand dune
- f. slip face
- g. ventifact

Lesson 10.3: Fill in the Blank

Name _____ Class _____ Date _____

Fill in the blank with the appropriate term.

- 1. The way the wind transports silt-sized particles is called _____.
- 2. Particles moved by wind cause erosion through the process of _____.
- 3. Wind carries sand grains up a sand dune by _____.
- 4. The _____ load carried by the wind includes particles of clay.
- 5. _____ sands are usually rounded and very uniform in size and shape.

6. Mud on the ocean floor comes from silt and clay carried from the land by _____.
7. _____ deposits consist of layer upon layer of wind-deposited clay and silt.

Lesson 10.3: Critical Writing

Name _____ Class _____ Date _____

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

Relate sediment size to the way sediments are transported by wind.