Changing Earth's Surface (pp. 88–91)

This section explains how sediment is carried away and deposited elsewhere to wear down and build up Earth's surface. The section also describes ways that gravity moves sediment downhill.

Use Target Reading Skills

As you read, fill in the graphic organizer below to compare and contrast types of mass movement.

Types of Mass Movement	Speed	Slope
Landslide	a.	b.
Mudflow	c.	d.
Slump	e.	f.
Creep	g.	h.

Wearing Down and Building Up (pp. 88–89)

1. What is erosion?
natural forces move weathered rock + soil

2. List the agents of erosion.
   a. gravity
   b. Waves
   c. running water
   d. Wind
   e. Glaciers

3. The material moved by erosion is called sediment.

4. Where does deposition occur?
where agents of erosion lay down sediment

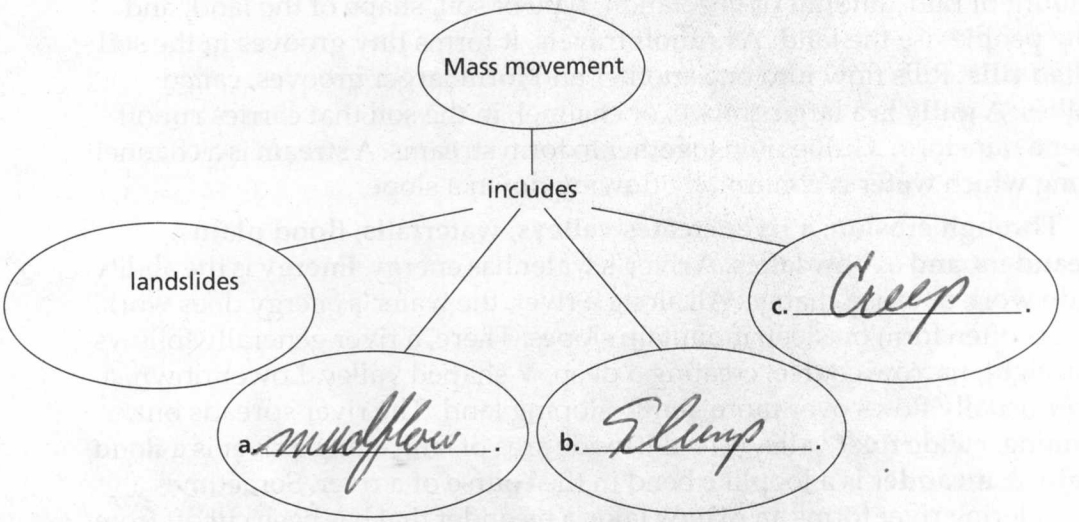
Mass Movement (pp. 89–91)

5. Circle the letter of each sentence that is true about gravity.
   a. It pulls things toward Earth's center.
   b. It causes landslides.
   c. It causes mass movement.
   d. It is an agent of erosion.

6. Is the following sentence true or false? The most destructive kind of mass movement is creep. false

7. Is the following sentence true or false? Mudflows and slump are especially likely in soils high in clay. true

8. Complete the concept map.



d. Write a sentence that explains the relationship among the concepts shown.
landslides, mudflows, slump & creep are types of mass movement

Match the type of mass movement with its description.

	Mass Movement	Description
B	9. landslide	a. Rock and soil suddenly slip down a slope in one large mass.
D	10. mudflow	b. Rock and soil slide quickly down a steep slope.
A	11. slump	c. Rock and soil move very slowly downhill.
C	12. creep	d. A mixture of water, rock, and soil moves rapidly downhill.

Water Erosion (pp. 94–103)

This section describes how moving water erodes and deposits sediment to create landforms such as valleys and deltas.

Use Target Reading Skills

Read the section "Alluvial Fans" on page 99 in your textbook. Complete the following flowchart showing the steps in the formation of an alluvial fan.

Alluvial Fan Formation

A stream flows out of a steep, narrow mountain valley.

↓

a. _____

↓

b. _____

↓

c. _____

Runoff and Erosion (pp. 95–96)

1. Water running downhill is the major agent of erosion.
2. Water that moves over Earth's surface when it rains is called runoff.
3. Other than how people use the land, list four factors that determine the amount of runoff in an area.
   a. amount of rain b. presence of vegetation
   c. soil type d. land shape
4. Is the following sentence true or false? More runoff generally means less erosion. false

Water Erosion *(continued)*

5. Fill in the first column of the table with the correct form of moving water.

Forms of Moving Water	
Form	**Description**
a. Rill	Water moving in a tiny groove in soil after a rainstorm
b. Gully	Water moving in a channel after a rainstorm
c. Stream	Water continually flowing down a slope through its own channel
d. River.	Water flowing downhill in a large channel

e. Which form of moving water causes the greatest changes in the shape of the land? Explain.
a river causes the greatest change because it is the largest form of energy

6. Unlike gullies, streams rarely dry up.

7. A large stream is also called a(n) river.

Erosion by Rivers (pp. 96–98)

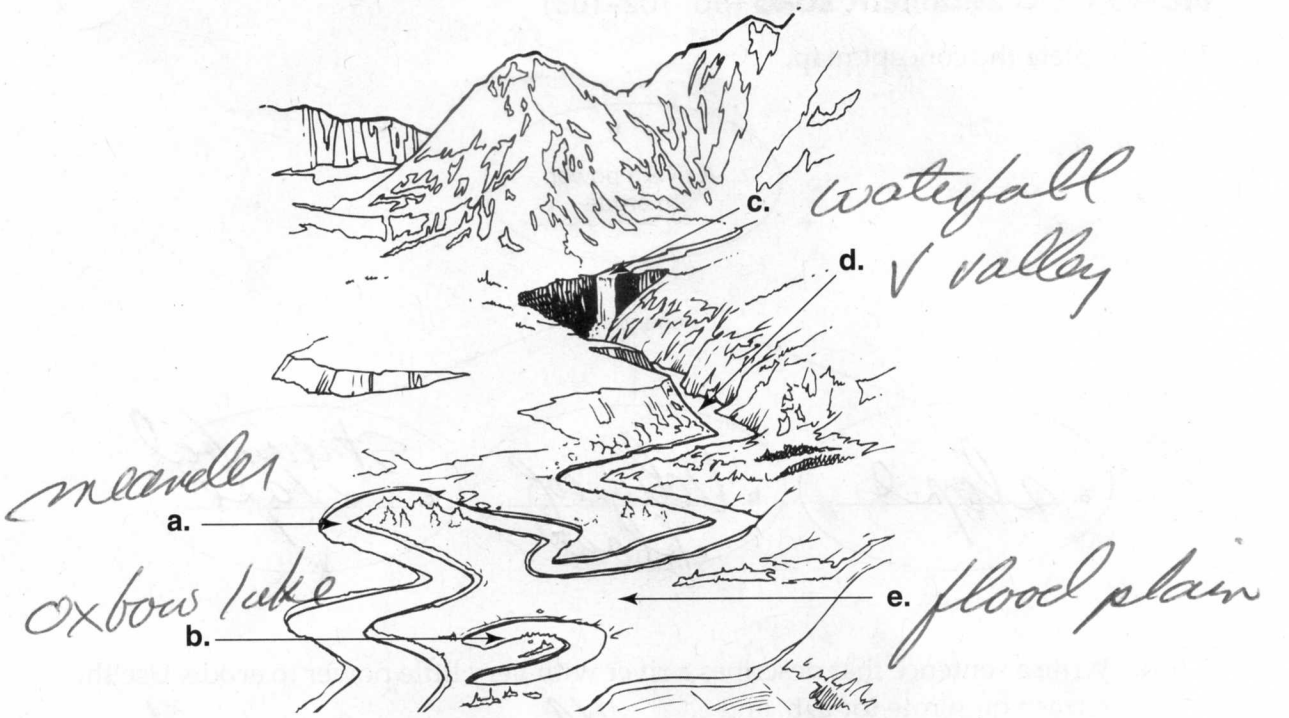
8. How do V-shaped valleys form?
river erosion

9. When does a river develop meanders?
flat plains w/ easily eroded material

10. A meander that has been cut off from a river is called a(n) Oxbow lake

Name _____ Date _____ Class _____

11. Identify and label each of the following landforms in the illustration: waterfall, oxbow lake, meander, flood plain, and V-shaped valley.



Deposits by Rivers (pp. 98–101)

12. List two landforms created from deposits by rivers.

a. alluvial fan b. delta

13. What is an alluvial fan?

gentle sloping fan-shaped deposit formed where a stream leaves a rit. steep.

14. Sediments deposited where a river flows into an ocean or lake form a(n) delta.

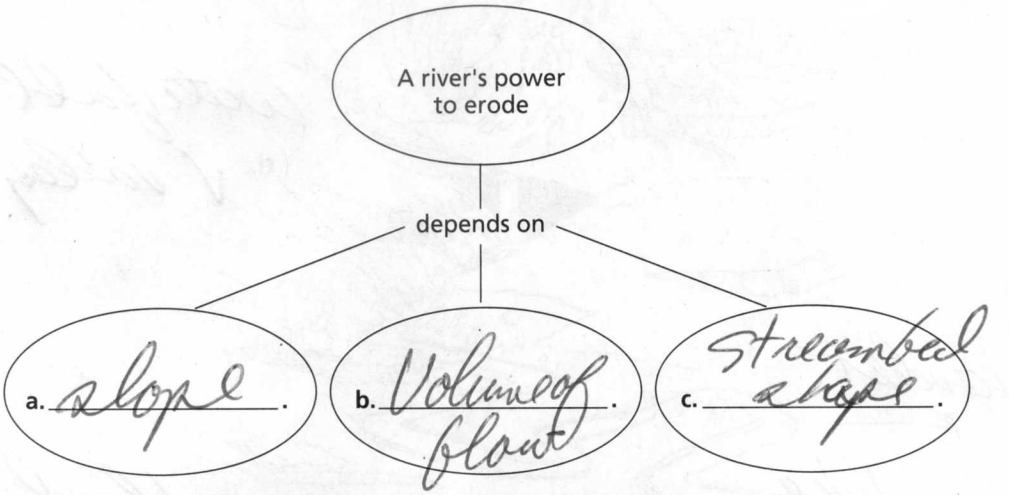
15. What makes a river valley fertile?

flooding rivers sediments rich in nutrients onto flood plain.

Water Erosion *(continued)*

Erosion and Sediment Load (pp. 102–103)

16. Complete the concept map.



d. Write a sentence that describes a river with very little power to erode. Use the terms you wrote for a, b, and c.

a river w/ very little power to erode would have a gentle slope, low volume & a shallow streambed shape

17. Is the following sentence true or false? When a river slows down and deposits its sediment load, smaller particles of sediment are deposited first. false

18. Circle the letter of each factor that increases the speed of a river.

a. steep slope
b. low volume
c. deep streambed
d. boulders in streambed

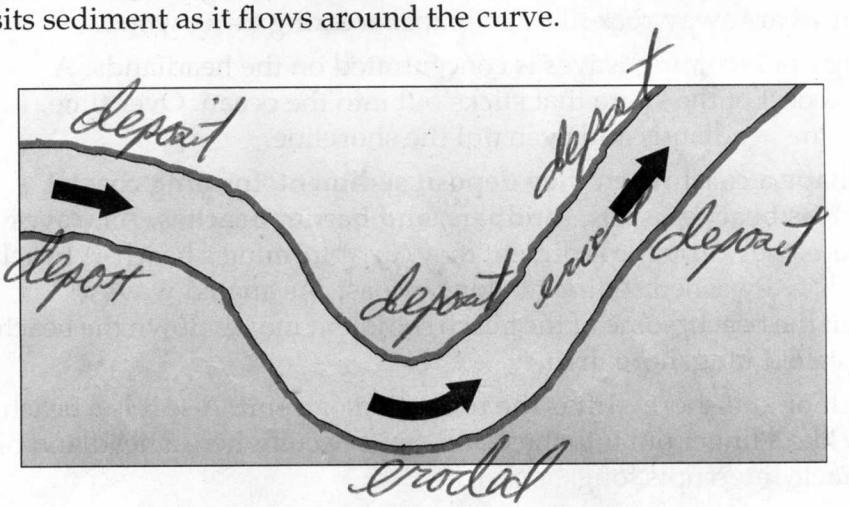
19. Circle the letter of each factor that decreases the speed of a river.

a. gentle slope
b. high volume
c. shallow streambed
d. boulders in streambed

20. Is the following sentence true or false? Where a river flows in a straight line, the water flows faster along the river's sides than near its center.

false

21. Label the drawing to show where the river erodes sediment and where it deposits sediment as it flows around the curve.

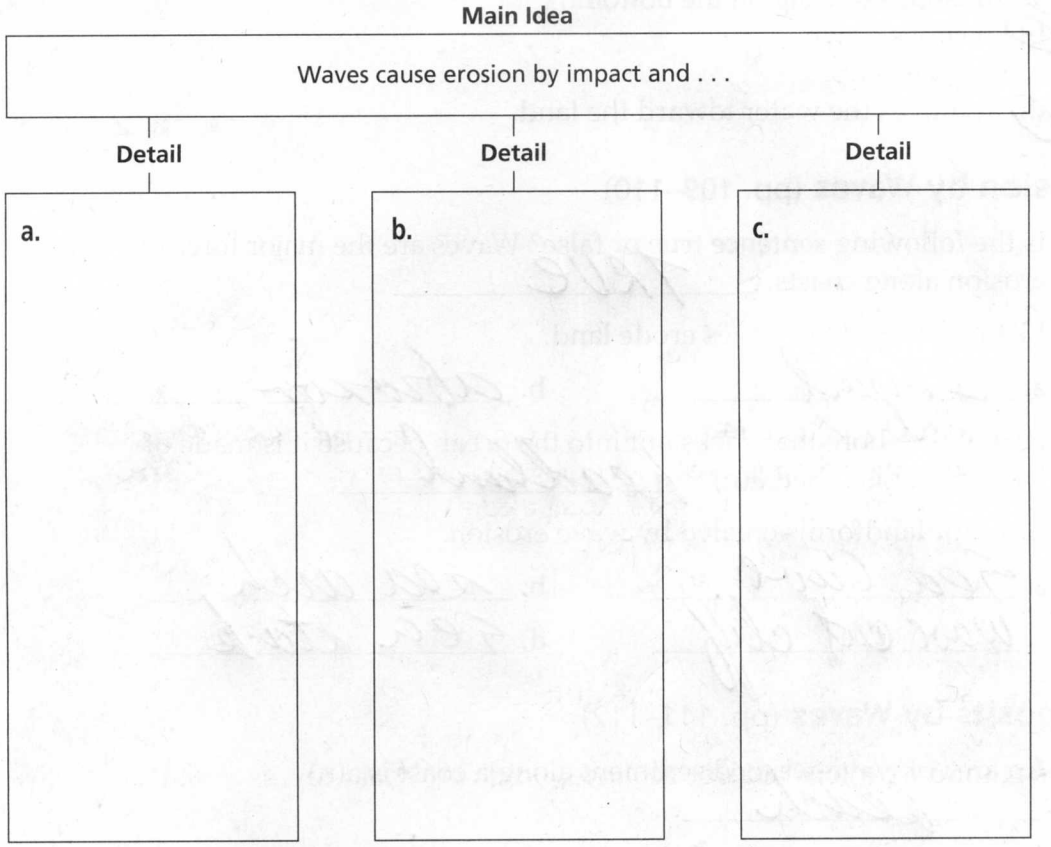


Waves and Wind (pp. 108–114)

This section explains how waves form and describes the erosion and deposition that waves cause. This section also describes how wind causes erosion and discusses the types of deposits that are caused by wind.

Use Target Reading Skills

As you read about waves, complete the graphic organizer by filling in the details.



How Waves Form (p. 108)

1. Circle the letter of each sentence that is true about the energy in waves.
   a. It comes from wind.
   b. It moves water particles up and down.
   c. It moves water particles forward.
   d. It moves across the water.

Waves and Wind *(continued)*

2. What part of the water is affected by a wave in deep water?
Only near the surface

3. Circle the letter of each sentence that is true about a wave approaching land.
   a. It begins to drag on the bottom.
   b. It slows down.
   c. It speeds up.
   d. It moves the water toward the land.

Erosion by Waves (pp. 109–110)

4. Is the following sentence true or false? Waves are the major force of erosion along coasts. TRUE

5. List two ways that waves erode land.
   a. Impact b. abrasion

6. Part of the shore that sticks out into the ocean because it is made of harder rock is called a(n) headland.

7. List four landforms created by wave erosion.
   a. Sea Cave b. sea arch
   c. wave cut cliff d. sea stack

Deposits by Waves (pp. 111–112)

8. An area of wave-washed sediment along a coast is a(n) beach.

9. The process in which beach sediment is moved down the beach with the current is called longshore drift

10. How does a spit form?
a headland interupts the longshore drift. + deposition occurs.

Name _____ Date _____ Class _____

Erosion by Wind (pp. 112–113)

11. A deposit of wind-blown sand is a(n) sand dune.

12. Is the following sentence true or false? Wind is the strongest agent of erosion. false

13. Why is wind effective in causing erosion in deserts?
the few plants

14. Circle the letter of each sentence that is true about deflation.
   a. It is the main way wind causes erosion.
   b. It usually has a great effect on the land.
   c. It can create blowouts.
   d. It can create desert pavement.

15. Circle the letter of each sentence that is true about abrasion by wind-carried sand.
   a. It can polish rock.
   b. It causes little erosion.
   c. It causes most desert landforms.
   d. It causes most erosion.

Deposition by Wind (p. 114)

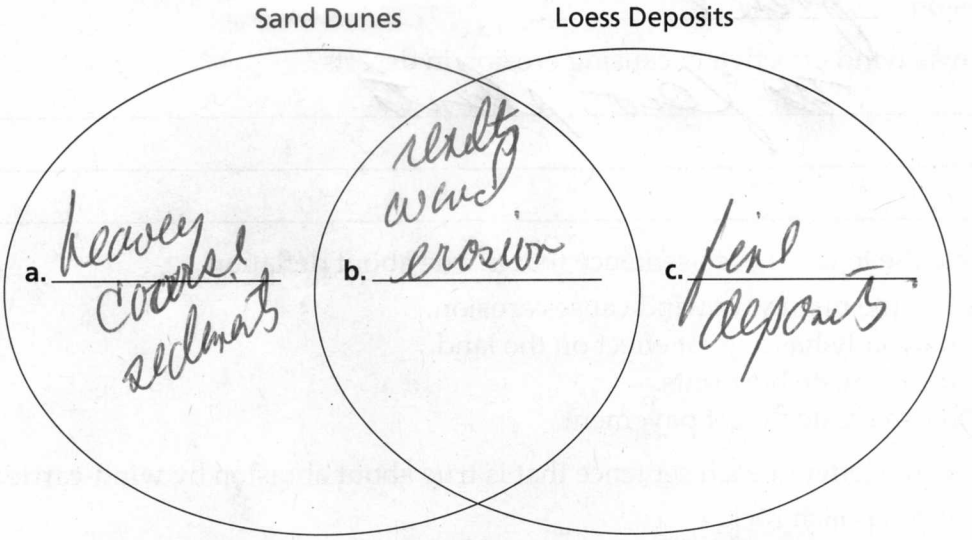
16. Is the following sentence true or false? All the sediment picked up by wind eventually falls to the ground. true

17. When does wind-carried sediment fall to the ground?
when wind slows - less energy.

18. List two types of deposits formed by wind erosion and deposition.
   a. sand dunes b. loess deposits.

Waves and Wind *(continued)*

19. Complete the Venn diagram by adding the following phrases: have finer sediments, have coarser sediments, result from wind erosion.



d. Which type of sediment can be found far from its source? Explain.

found far from the source because of the fine particle size requires less energy.

Glaciers (pp. 115–119)

This section describes huge ice masses, called glaciers. The section also describes the ice ages, a time when glaciers covered much of Earth. In addition, the section explains how glaciers form and move and how they cause erosion and deposition.

Use Target Reading Skills

Read the section "How Glaciers Shape the Land" on page 117 in your textbook. Complete the following flowchart showing the steps of glacial erosion.

Glacial Erosion

A glacier picks up rocks as it flows over land.

↓

a. _____

↓

b. _____

↓

c. _____

How Glaciers Form and Move (p. 116)

1. Any large mass of ice that moves slowly over land is a(n) glaciers.
2. Circle the letter of each sentence that is true about continental glaciers.
   a. They are larger than valley glaciers.
   b. They spread out over wide areas.
   c. They are found only in Antarctica.
   d. They cover almost half of Earth's land.
3. What are ice ages? when continental glaciers cover large areas
4. Is the following sentence true or false? The most recent ice age ended about 10,000 years ago. false
5. Is the following sentence true or false? All of North America was covered by a continental glacier in the last ice age. fake.

6. Circle the letter of each sentence that is true about valley glaciers.
   a. They are generally long, narrow glaciers.
   b. They are found on many high mountains.
   c. They are larger than continental glaciers.
   d. They usually move down valleys.

7. Where can glaciers form?
   where more snow falls than melts away

8. When does the snow and ice that make up a glacier begin to move downhill?
   when depth reaches > 30 to 40 meters

9. Complete the table to show how the different types of glaciers move.

How Glaciers Move	
Type of Glacier	**How It Moves**
a. Continental	Flows in all directions
b. Valley	Flows in a surge

   c. Relate the movement of continental glaciers to why they cover Antarctica and most of Greenland.
   Continental can cover entire land masses as they spread out in all directions

How Glaciers Shape the Land (pp. 117–119)

10. List two processes by which glaciers erode the land.
    a. plucking b. abrasion

11. Is the following sentence true or false? Plucking can move only small stones. false

Glaciers *(continued)*

12. Describe abrasion and how it affects bedrock.

rocks on bottom of glacier drag across & gouges & scratches bedrock.

13. When does a glacier deposit the sediment it is carrying?

when glacier melts.

Match each type of glacial landform with its description.

	Type of Landform	Description
B	14. till	a. Small depression formed by a chunk of ice when it melts
C	15. moraine	b. Mixture of sediments a glacier deposits on the surface
E	16. terminal moraine	c. Ridge formed at the edge of a glacier
D	17. drumlin	d. Long mound of till that is smoothed in the direction of the glacier's flow
A	18. kettle	e. Ridge at the farthest point reached by a glacier
G	19. cirque	f. Sharp ridge separating two cirques
F	20. arête	g. Bowl-shaped hollow eroded by a glacier
H	21. fiord	h. Sea-filled valley cut by a glacier in a coastal region

22. Explain the difference between glacial erosion and glacial deposition.

pluck & drag when glacier grows & deposition when it melts.