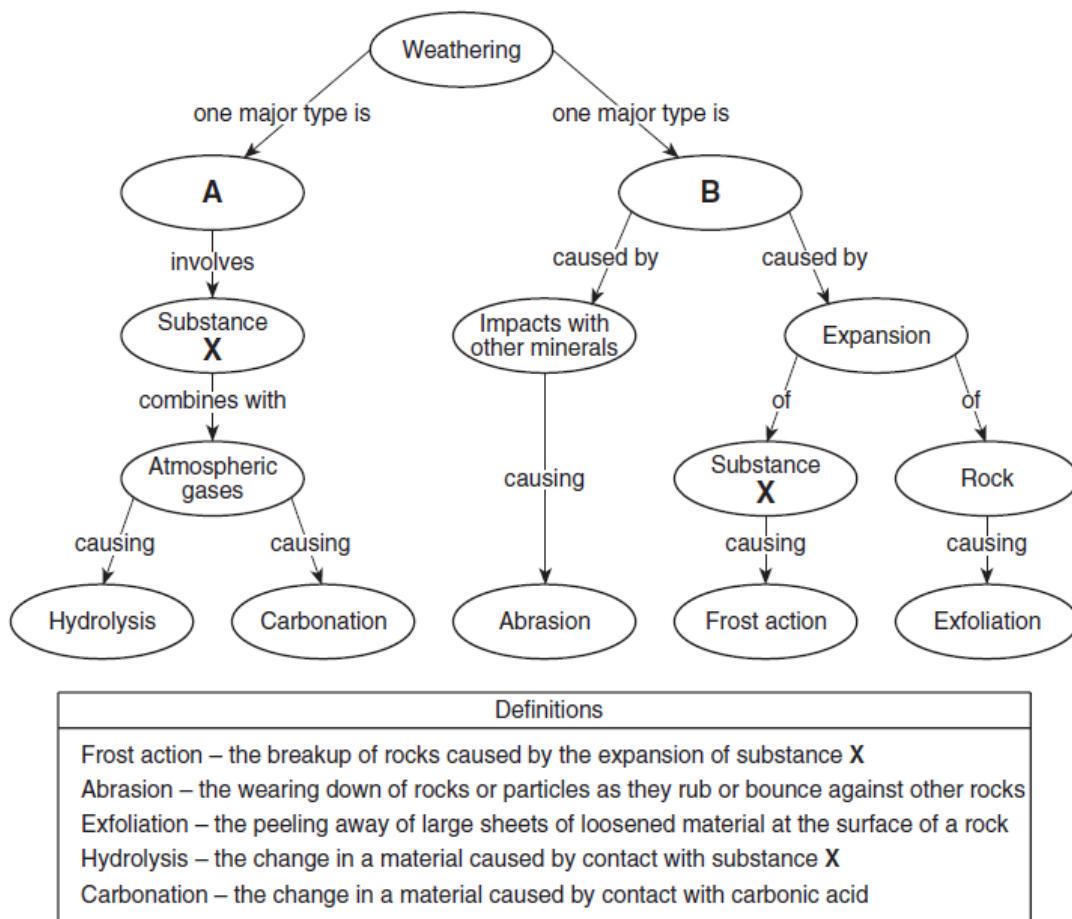


Topic 12 - Shaping the Earth

Base your answers to questions 1 through 3 on flowchart below, which shows a general overview of the processes and substances involved in the weathering of rocks at Earth's surface. Letter *X* represents an important substance involved in both major types of weathering, labeled *A* and *B* on the flowchart. Some weathering processes are defined below the flowchart.

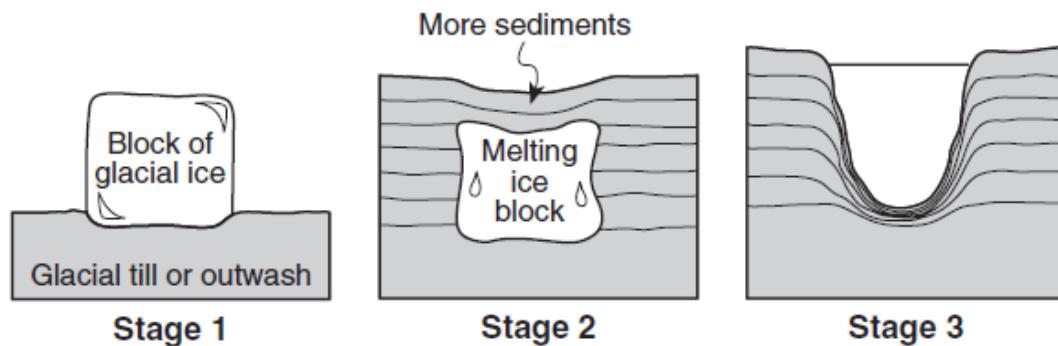


1. Which term best identifies the type of weathering represented by *A*?
A) physical B) biological C) **chemical** D) glacial
2. Which substance is represented by *X* on both sides of the flowchart?
A) potassium feldspar B) air
C) hydrochloric acid D) **water**
3. Which weathering process is most common in a hot, dry environment?
A) abrasion B) carbonation C) frost action D) hydrolysis

4. A stream flowing at a velocity of 75 centimeters per second can transport
A) clay, only
B) pebbles, only
C) pebbles, sand, silt, and clay, only
D) boulders, cobbles, pebbles, sand, silt, and clay
5. Sediments found in glacial moraines are best described as
A) sorted and layered
B) sorted and not layered
C) unsorted and layered
D) unsorted and not layered

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6. The cross sections below show a three-stage sequence in the development of a glacial feature.



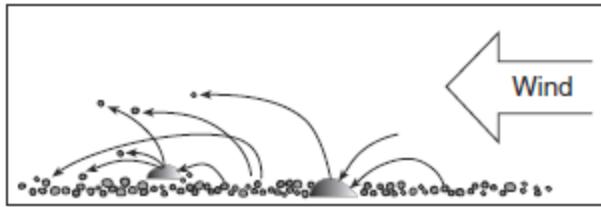
Which glacial feature has formed by the end of stage 3?

- A) kettle lake
- B) finger lake
- C) drumlin
- D) parallel scratches

7. Why are Precambrian gneiss cobbles and boulders commonly found on top of the surface bedrock in the Catskills?

- A) The surface bedrock of the Catskills is composed of Precambrian gneiss.
- B) The surface bedrock of the Catskills has been overturned.
- C) Many meteorites composed of gneiss have landed in the Catskills.
- D) Glaciers transported these rocks from the Adirondacks to the Catskills.**

8. The diagram below shows sand particles being moved by wind.



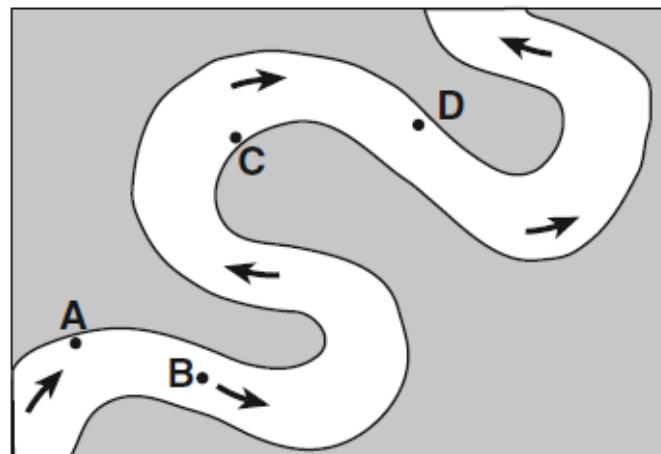
At which Earth surface locations is this process usually the most dominant type of erosion?

- A) deserts and beaches**
- B) deltas and floodplains
- C) glaciers and moraines
- D) mountain peaks and escarpments

9. Which agent of erosion is most likely responsible for the deposition of sandbars along ocean shorelines?

- A) glaciers
- B) mass movement
- C) wave action**
- D) wind action

10. The map below shows a meandering stream. Points A, B, C, and D represent locations along the stream bottom.



At which location is the greatest amount of sediment most likely being deposited?

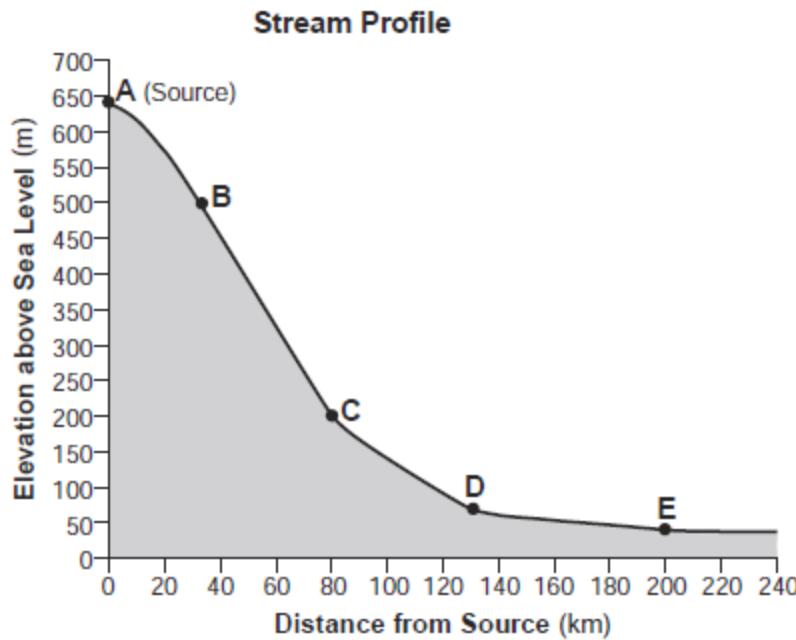
- A) A
- B) B
- C) C**
- D) D

11. What is the minimum water velocity necessary to maintain movement of 0.1-centimeter-diameter particles in a stream?

- A) 0.02 cm/s
- B) 0.5 cm/s
- C) 5.0 cm/s**
- D) 20.0 cm/s

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Base your answers to questions 12 through 14 on the cross section and data table below and on your knowledge of Earth science. The cross section shows the profile of a stream that is flowing down a valley from its source. Points A through E represent locations in the stream. The data table shows the average stream velocity at each location. The volume of water in the stream remains the same at all locations.



Location in Stream	Average Stream Velocity (cm/s)
A	10
B	110
C	130
D	20
E	15

12. Which features could be formed by the stream between locations D and E?

- A) meanders B) kettle lakes C) barrier islands D) drumlins

13. What is the largest type of sediment that could be transported at location B?

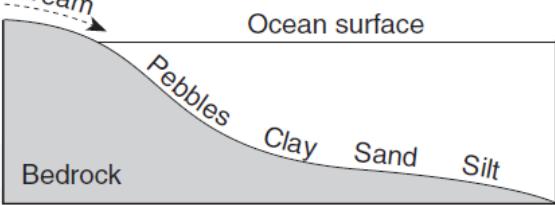
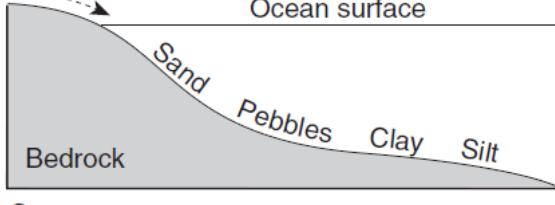
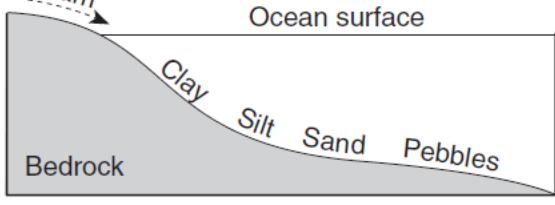
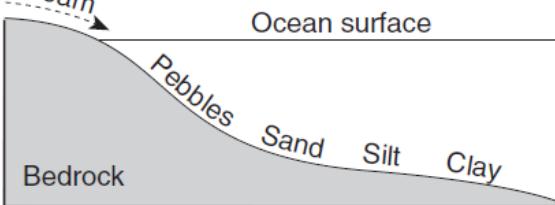
- A) silt B) sand C) pebbles D) cobbles

14. The average stream velocity at each location is controlled primarily by the

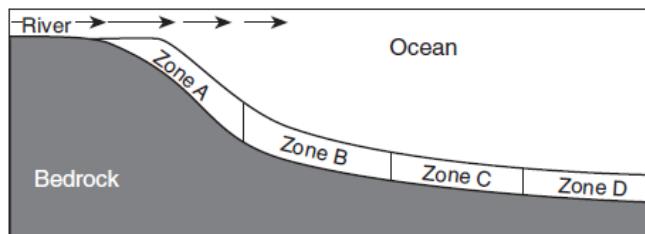
- A) elevation above sea level B) slope of the land
C) sediment carried by the stream D) distance from the stream's source

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15. Which profile best shows the general depositional pattern that occurs when water from a stream enters the ocean?

- A)  Ocean surface
Bedrock
Stream
Pebbles Clay Sand Silt
- B)  Ocean surface
Bedrock
Stream
Sand Pebbles Clay Silt
- C)  Ocean surface
Bedrock
Stream
Clay Silt Sand Pebbles
- D)  Ocean surface
Bedrock
Stream
Pebbles Sand Silt Clay

Base your answers to questions 16 and 17 on the cross section and data table shown below. The cross section shows a sediment-laden river flowing into the ocean. The arrows show the direction of river flow. Different zones of sorted sediments, A, B, C, and D, have been labeled. Sediments have been taken from these zones and measured. The data table shows the range of sediment sizes in each zone.



Data Table

Zone	Major Sediment Sizes
A	0.04 cm to 6 cm
B	0.006 cm to 0.1 cm
C	0.0004 cm to 0.006 cm
D	Less than 0.0004 cm

16. The sedimentary rock, siltstone, will most likely form from sediments deposited in zone

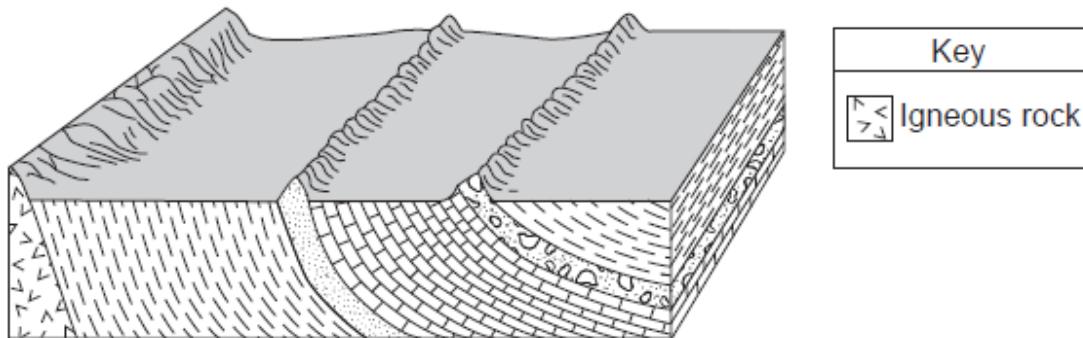
- A) A B) B C) C D) D

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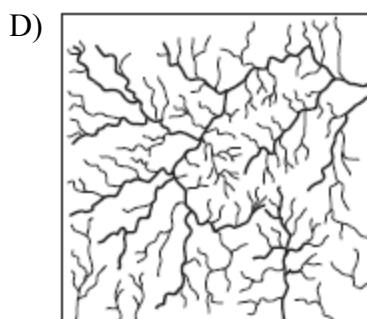
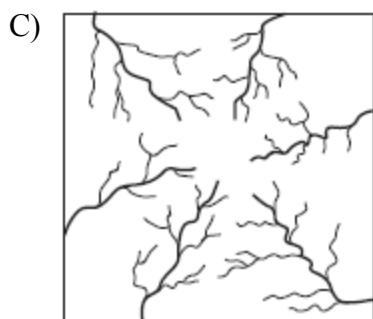
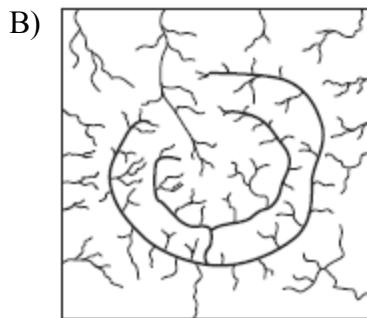
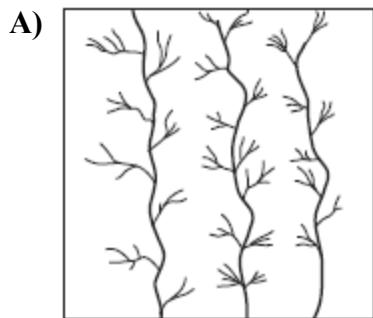
17. How is this pattern of horizontal sorting produced?

- A) High-density materials generally settle more slowly.
- B) Rounded sediments generally settle more slowly.
- C) Dissolved minerals are generally deposited first.
- D) Bigger particles are generally deposited first.**

18. The block diagram below shows a landscape region.



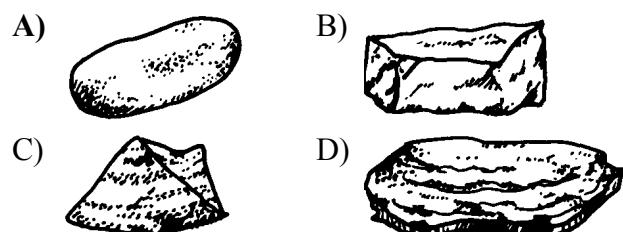
Which stream drainage pattern would most likely develop at the surface of this region?



19. Which factor is most influential in determining the rate of landscape change in a particular location?

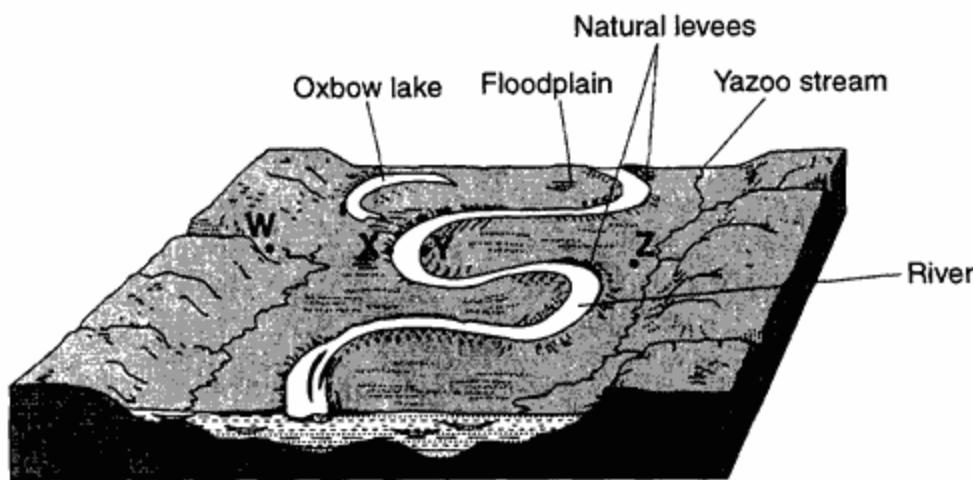
- A) the age of bedrock
- B) the local climate**
- C) the prevailing wind patterns
- D) the soil particle size

20. Which quartz sample has probably undergone abrasion in a stream for the longest period of time?



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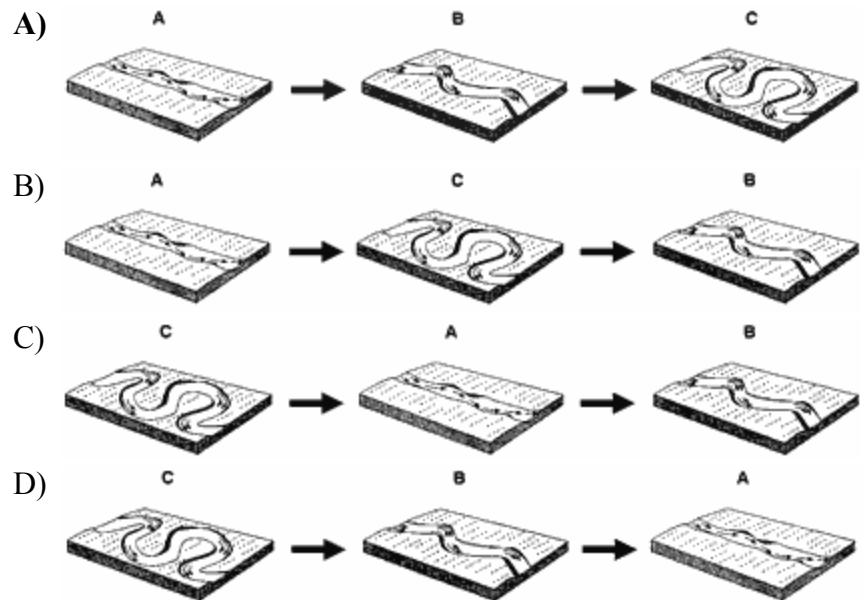
Base your answers to questions 21 through 24 on "
the diagram below, which represents the landscape features associated with a meandering river.
Letters *W*, *X*, *Y*, and *Z* represent locations on the floodplain.



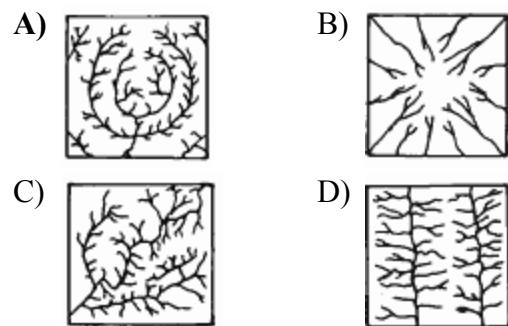
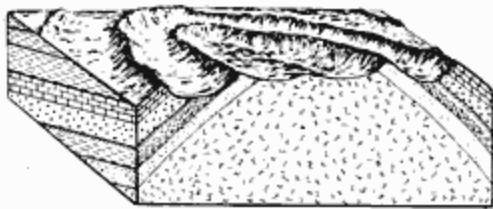
21. Which change would most likely increase the velocity of the river?
**A) a decrease in the slope of the river B) a decrease in the temperature of the river
C) **an increase in the river's discharge** D) an increase in the width of the river**
22. During transport by this river, a sediment particle will most likely become
A) more rounded B) more dense C) heavier D) larger
23. The natural levees are ridges of sediment that slope away from the riverbank toward the floodplain. Which process most likely formed these levees?
**A) weathering of the soil on the riverbanks
B) erosion on the inside curves of the meanders
C) deposition by the yazoo stream
D) **deposition when the river overflowed its banks****

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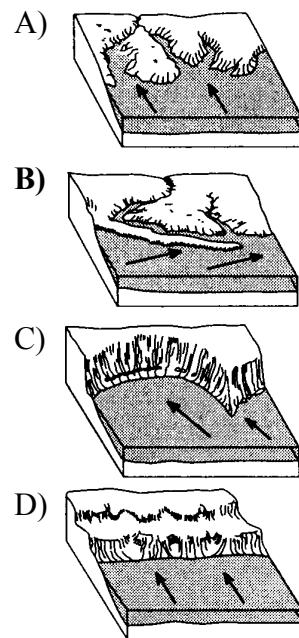
24. The choices below represent stages in the formation of a meandering river. Which sequence **best** represents the usual changes over time?



25. Which kind of stream pattern would most likely be found on the type of landscape shown in the diagram?

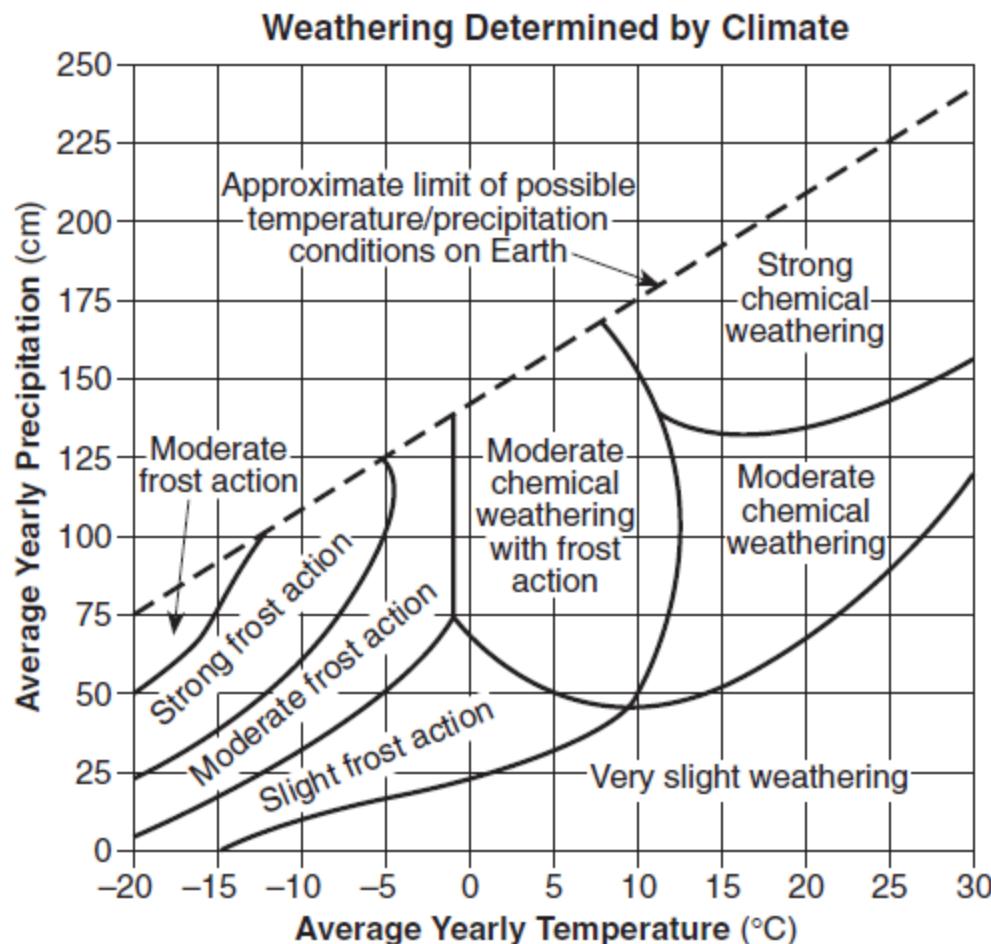


26. The diagrams below represent landscape features found along the seacoast. The arrows show ocean-wave direction. Which shoreline has been shaped more by deposition than by erosion?



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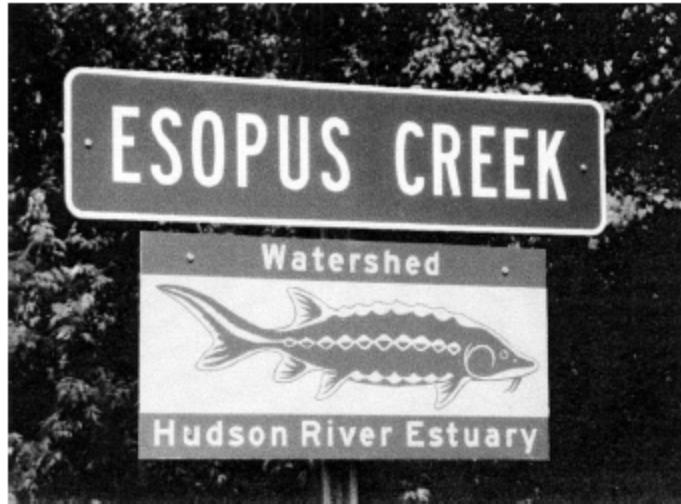
Base your answers to questions 27 and 28 on the graph below, which shows the effect that average yearly precipitation and temperature have on the type of weathering that will occur in a particular region.



27. The amount of chemical weathering will increase if
- A) air temperature decreases and precipitation decreases
 - B) air temperature decreases and precipitation increases
 - C) air temperature increases and precipitation decreases
 - D) air temperature increases and precipitation increases**
28. Which type of weathering is most common where the average yearly temperature is 5°C and the average yearly precipitation is 45 cm?
- A) moderate chemical weathering
 - B) very slight weathering
 - C) moderate chemical weathering with frost action
 - D) slight frost action**

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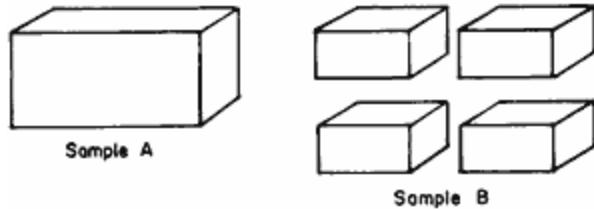
29. The photograph below shows a sign near the Esopus Creek in Kingston, New York.



The main purpose of the word "watershed" on this sign is to communicate that the Esopus Creek

- A) is a tributary of the Hudson River
- B) is a flood hazard where it flows into the Hudson River
- C) forms a delta in the Hudson River
- D) contains ancient fish fossils

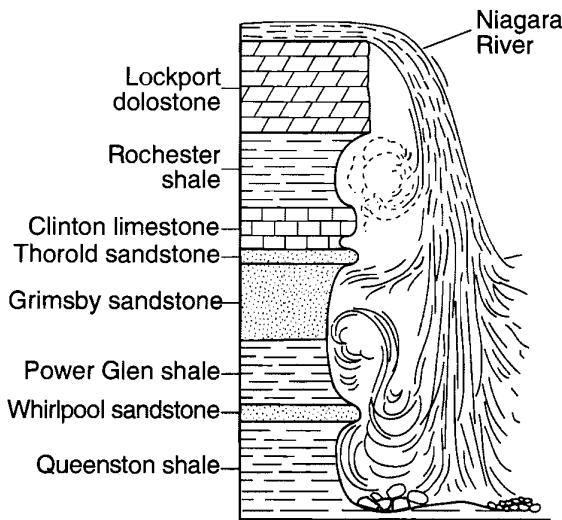
30. The diagram below represents equal masses of two identical rock samples. Sample A is one large block, while sample B was cut into four smaller blocks of equal size.



If subjected to the same environmental conditions, sample B will weather more quickly than sample A. The best explanation for this is that the

- A) volume of sample B is greater than that of sample A
- B) surface area of sample B is greater than that of sample A
- C) density of sample A is greater than that of sample B
- D) hardness of sample A is greater than that of sample B

31. The generalized cross section below shows the sedimentary rock layers at Niagara Falls in western New York State.

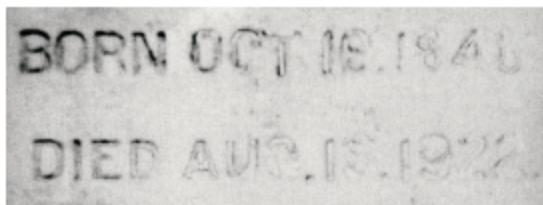


Which rock layer appears to be most resistant to weathering and erosion?

- A) Lockport dolostone
- B) Rochester shale
- C) Grimsby sandstone
- D) Queenston shale

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32. The two photographs below show dates on tombstones found in a cemetery in St. Remy, New York. The tombstones were 5 meters apart and both faced north. Tombstone *A* had dates cut into the rock in 1922. Tombstone *B* had dates cut into the rock in 1892.



Tombstone A (1922)



Tombstone B (1892)

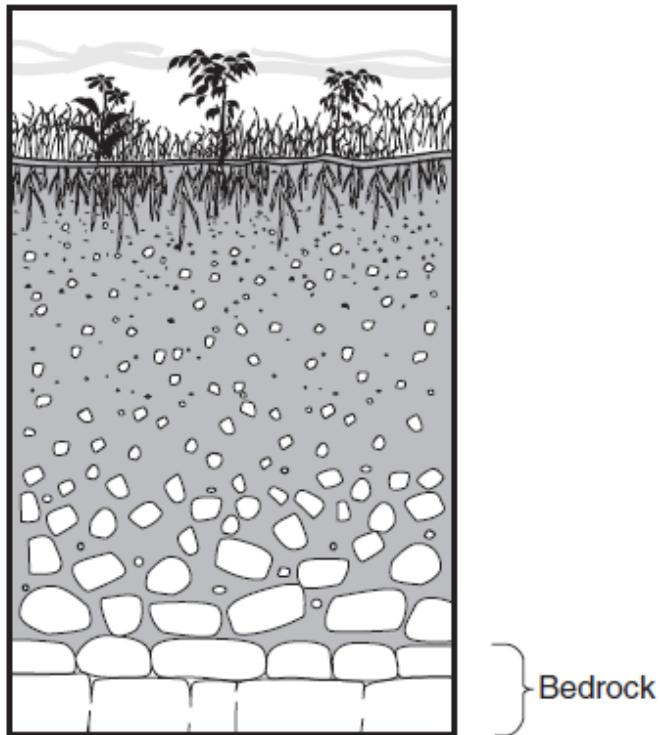
Which statement best explains why the dates are more difficult to read on tombstone *A* than on tombstone *B*?

- A) Tombstone *A* is composed of minerals less resistant to weathering than tombstone *B*.
- B) Tombstone *A* has undergone a longer period of weathering than tombstone *B*.
- C) Tombstone *A* experienced cooler temperatures than tombstone *B*.
- D) Tombstone *A* was exposed to less acid rain than tombstone *B*.

33. Which statement best describes sediments deposited by glaciers and rivers?

- A) Glacial deposits and river deposits are both sorted.
- B) Glacial deposits are sorted, and river deposits are unsorted.
- C) Glacial deposits are unsorted, and river deposits are sorted.
- D) Glacial deposits and river deposits are both unsorted.

34. The cross section below shows a soil profile.



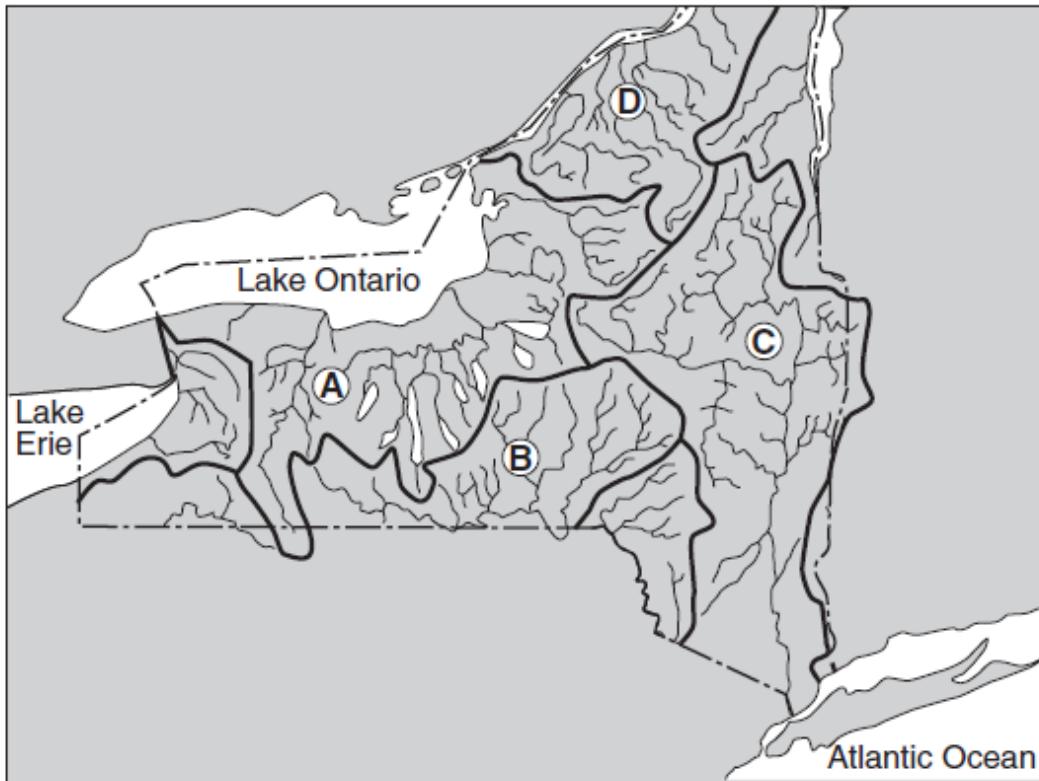
This soil was formed primarily by

- A) erosion by glaciers
- B) erosion by running water
- C) capillarity and human activity
- D) weathering and biological activity

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35. The map below shows four watershed regions in New York State labeled *A* through *D*.

Watersheds



Which lettered section represents the watershed of the Mohawk and Hudson Rivers?

- A) *A* B) *B* C) *C* D) *D*

36. In the cartoon below, Lucy gives Linus incorrect information about pebbles.

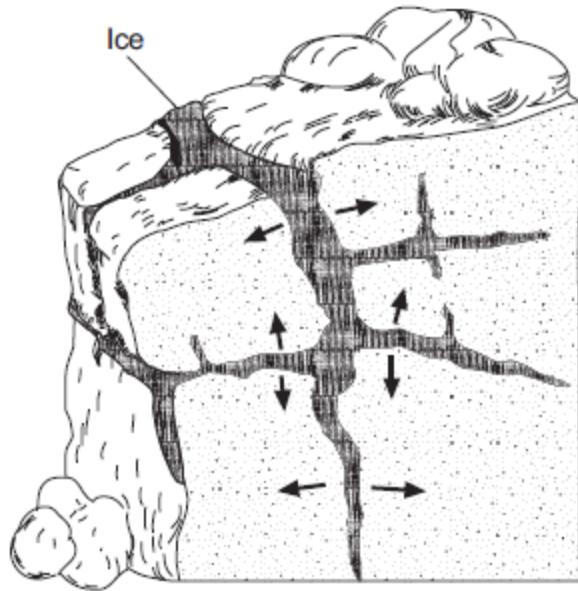


If Lucy wanted to give Linus correct information about pebbles, which statement would be most accurate?

- A) Pebbles can become cemented together to form a rock called gabbro.
B) Pebble is the name given to the smallest-size sediment.
C) Any large rock that weathers could become a pebble.
D) Magma is composed of pebbles.

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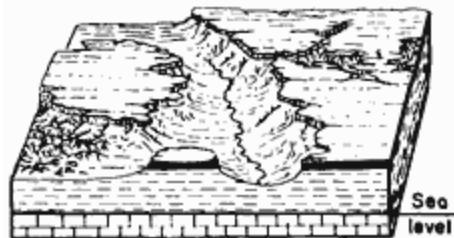
37. The diagram below shows granite bedrock with cracks. Water has seeped into the cracks and frozen. The arrows represent the directions in which the cracks have widened due to weathering.



Which statement best describes the physical weathering shown by the diagram?

- A) Enlargement of the cracks occurs because water expands when it freezes.
- B) This type of weathering occurs only in bedrock composed of granite.
- C) The cracks become wider because of chemical reactions between water and the rock.
- D) This type of weathering is common in regions of primarily warm and humid climates.

38. The landscape shown below developed in a region with an arid climate.

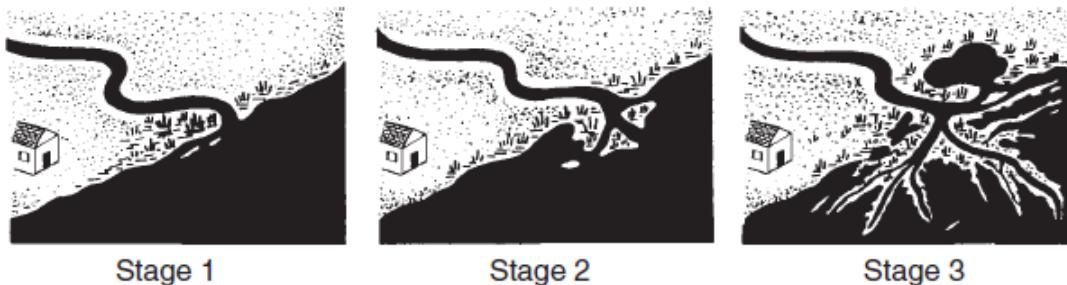


If the erosion of this plateau had taken place in a much more humid climate, which diagram below best represents how the landscape would appear?

- A) A cross-section showing a plateau with a very dense and complex network of branching gullies and channels, indicating significant soil erosion.
- B) A cross-section showing a plateau with several deep, V-shaped gullies cutting through the surface, characteristic of sheet wash erosion in a humid climate.
- C) A cross-section showing a plateau with rounded hills and a prominent central peak, possibly a volcanic feature, with some surface runoff and minimal gully development.
- D) A cross-section showing a coastal area where a steep cliff meets a sandy beach, with no plateau or interior landform depicted.

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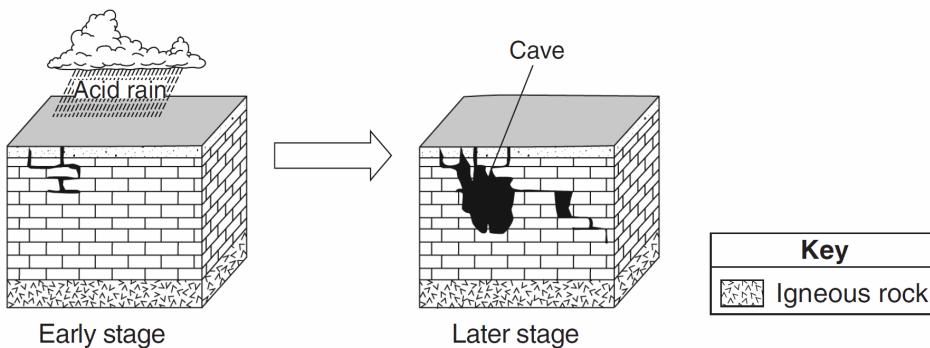
39. The diagrams below show gradual stages 1, 2, and 3 in the development of a river delta where a river enters an ocean.



Which statement best explains why the river delta is developing at this site?

- A) The rate of deposition is less than the rate of erosion.
- B) The rate of deposition is greater than the rate of erosion.**
- C) Sea level is slowly falling.
- D) Sea level is slowly rising.

40. The two block diagrams below represent the formation of caves.



Which types of weathering and erosion are primarily responsible for the formation of caves?

- A) chemical weathering and groundwater flow**
- B) chemical weathering and runoff
- C) physical weathering and groundwater flow
- D) physical weathering and runoff

Answer Key
Topic - 12 Shaping the Earth

- | | | | |
|-----|----------|-----|----------|
| 1. | <u>C</u> | 37. | <u>A</u> |
| 2. | <u>D</u> | 38. | <u>B</u> |
| 3. | <u>A</u> | 39. | <u>B</u> |
| 4. | <u>C</u> | 40. | <u>A</u> |
| 5. | <u>D</u> | | |
| 6. | <u>A</u> | | |
| 7. | <u>D</u> | | |
| 8. | <u>A</u> | | |
| 9. | <u>C</u> | | |
| 10. | <u>C</u> | | |
| 11. | <u>C</u> | | |
| 12. | <u>A</u> | | |
| 13. | <u>C</u> | | |
| 14. | <u>B</u> | | |
| 15. | <u>D</u> | | |
| 16. | <u>C</u> | | |
| 17. | <u>D</u> | | |
| 18. | <u>A</u> | | |
| 19. | <u>B</u> | | |
| 20. | <u>A</u> | | |
| 21. | <u>C</u> | | |
| 22. | <u>A</u> | | |
| 23. | <u>D</u> | | |
| 24. | <u>A</u> | | |
| 25. | <u>A</u> | | |
| 26. | <u>B</u> | | |
| 27. | <u>D</u> | | |
| 28. | <u>D</u> | | |
| 29. | <u>A</u> | | |
| 30. | <u>B</u> | | |
| 31. | <u>A</u> | | |
| 32. | <u>A</u> | | |
| 33. | <u>C</u> | | |
| 34. | <u>D</u> | | |
| 35. | <u>C</u> | | |
| 36. | <u>C</u> | | |