

STREAM DRAINAGE PATTERNS (start by reading the first page of these notes!)**WHAT IS A DRAINAGE PATTERN?**

Streams seek the lowest path as they move downhill, and they tend to erode their beds in places where the ground is weak. Therefore, both topography and geologic structure influence the path streams follow through an area, which we call the drainage pattern. By looking at a map view of a stream (the view from an airplane), you can often infer the underlying bedrock structures. The most common stream pattern is a dendritic drainage pattern.

Dendritic streams flow downhill in the same general direction and they join to make larger streams. As a result, they have a branching appearance. This pattern is common where the bedrock is uniform, without faults, folds, or other major structures or zones of weakness to capture the streams. Dendritic drainage is also common where the rock layers are horizontal. Much of the region of western New York State north of the Pennsylvania border has dendritic drainage because rock layers are flat and there are few faults or folds to divert streams.

A **radial** drainage pattern resembles the spokes of a wheel. Streams flow away from a high point at the center of the pattern. Radial drainage may develop on a smooth dome or a volcanic cone. The Adirondack Mountain region of New York displays radial drainage, although rock structures such as faults and folds in the Adirondacks alter the regional pattern and may make radial drainage hard to observe.

Annular drainage is a pattern of concentric circles that are connected by short radial stream segments. This type of drainage occurs in an eroded dome and is rarely observed.

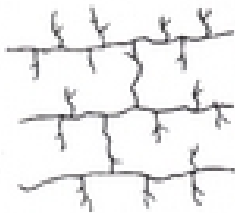
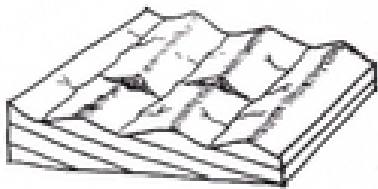
A region that has prominent parallel and perpendicular faults, repeated folds, or a strong rectangular jointing pattern will display a rectangular or **trellis** drainage pattern. (Joints are cracks in bedrock along which no significant movement has occurred. They may be related to expansion or regional forces acting on bedrock.) Streams seek the lowest areas of folds, fractured rocks along faults, or the weakest surface bedrock. Trellis drainage patterns can be observed in the folded mountains of central Pennsylvania. There streams and creeks run in the weak and easily-eroded layers of the folded Appalachian mountains.

The important point is that the underlying rock types and geologic structures influence streams, and that different structural features produce different patterns of drainage.

THE _____ OF IN AN AREA WILL CAUSE STREAMS TO DRAIN IN A _____ THAT CAN BE SEEN FROM OVER-HEAD (airplane).

THESE ARE CALLED _____

Match the geologic structures below
To the drainage patterns they would create.



A: _____:

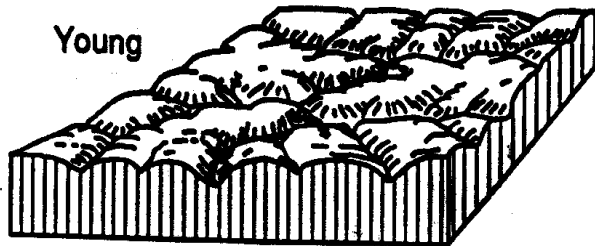
B: _____:

C: _____:

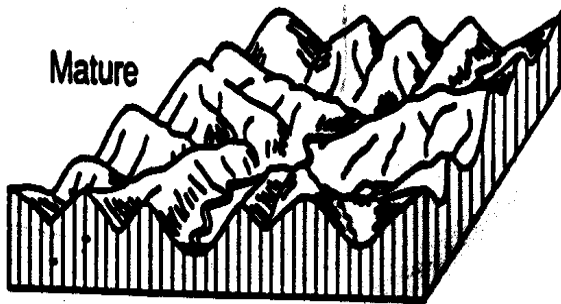
D: _____:

The maturity of a landscape depends upon the portion of the land that has been worn down to or near

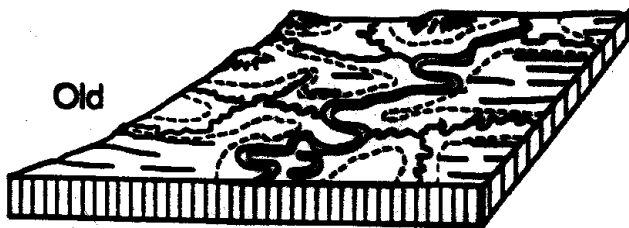
The 3 stages of landscape maturity (describe each diagram)



1. _____
2. _____
3. _____
4. _____



1. _____
2. _____
3. _____
4. _____



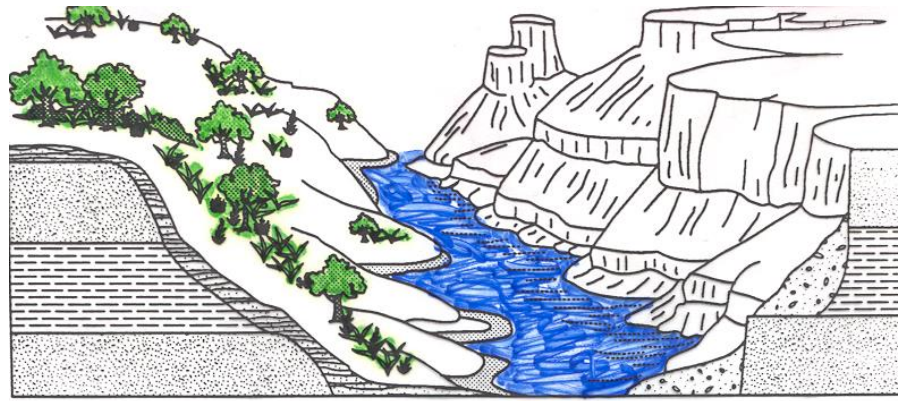
1. _____
2. _____
3. _____
4. _____

- _____ can cause old landscapes to be rejuvenated back to young again.

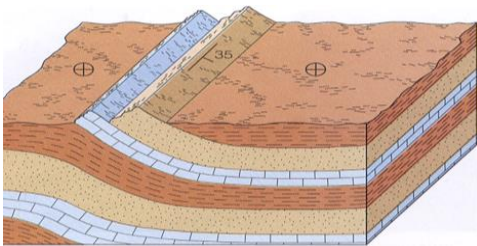
The Influence of Humans:

Environmental planning and conservation can help to preserve our soil, water, and air.

The Influence of Climate on Landscape:



	Humid (moist)	Arid (dry)
Slope		
Soil		
Type of Weathering		



Notice how the rock types weather differently. Differences in rock resistance creates varied & interesting landscapes. Which rock is least resistant?

If uplifting forces have been dominant the landscape will be _____.

If erosion has been dominant the landscape will be _____ or _____.

If uplifting and leveling forces are in balance, the landscape is in _____

Name: _____ Period: _____ Date: _____

Review Questions:

Use the two New York State Maps on pages 2 and 3 of your Reference Tables to answer the following questions:

1. Which of the landscape regions occupies the greatest area in New York State?
2. In which landscape region can you find the finger lakes?
3. In which landscape region can you find Mt. Marcy?
4. List 5 cities that are located in the Allegheny Plateau:
5. List 3 cities that are located in the Erie-Ontario Lowlands:
6. Which landscape region is the youngest?
7. What is the distance between Mt. Marcy and Slide Mt. In Miles and Kilometers?

_____ miles _____	_____ Kilometers _____	
Landscape Region	Geologic time period the Region was formed	Dominant rock type (classification)
Erie-Ontario Lowlands		
Adirondack Mountains		
Tug Hill Plateau		
Hudson-Mohawk Lowlands		
Newark Lowlands		
Atlantic Coastal Plain		
Allegheny Plateau		





The table below describes the characteristics of three landscape regions, *A*, *B*, and *C*, found in the United States.

Landscape	Bedrock	Elevation/Slopes	Streams
<i>A</i>	Faulted and folded gneiss and schist	High elevation Steep slopes	High velocity Rapids
<i>B</i>	Layers of sandstone and shale	Low elevation Gentle slopes	Low velocity Meanders
<i>C</i>	Thick horizontal layers of basalt	Medium elevation Steep to gentle slopes	High to low velocity Rapids and meanders

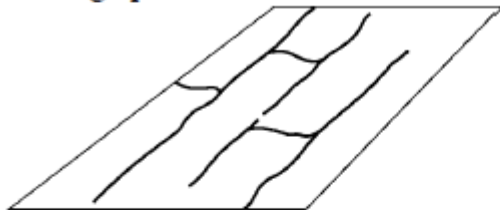
Which list best identifies landscapes *A*, *B*, and *C*?

- A) *A*—mountain, *B*—plain, *C*—plateau
- B) *A*—plain, *B*—plateau, *C*—mountain
- C) *A*—plateau, *B*—mountain, *C*—plain
- D) *A*—plain, *B*—mountain, *C*—plateau


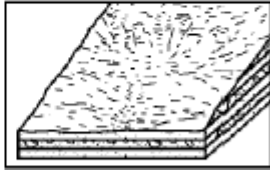
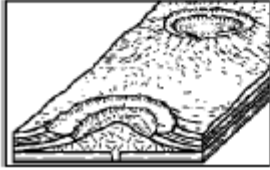

Which stream drainage pattern would most likely develop on the surface of a volcano?

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


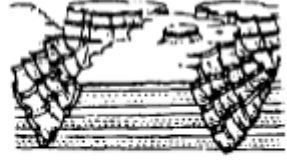
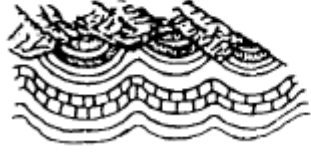

The diagram below represents a map view of a stream drainage pattern.



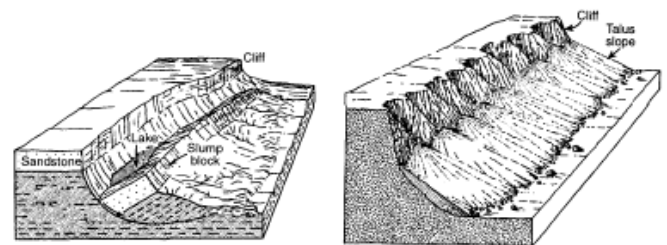
Which underlying bedrock structure most likely produced this stream drainage pattern?

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

Which diagram represents a plateau landscape?

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

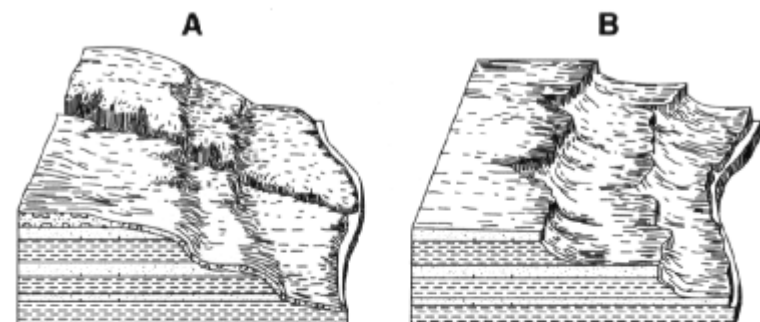
Two landscape regions are shown below.



The evidence shown indicates that currently each landscape region is being modified primarily by

- A) weathering and erosion
- B) lithospheric plate movement
- C) folding and faulting
- D) metamorphism

The block diagrams below show two landscape regions labeled *A* and *B*.



What is the most probable cause of the difference in surface features between *A* and *B*?

- A) *A* is the result of a humid climate, while *B* is the result of a dry climate.
- B) *A* is at a high elevation, while *B* is located at sea level.
- C) *A* is a plateau region, while *B* is a mountainous region.
- D) *A* is composed of igneous bedrock, while *B* is composed of sedimentary bedrock.