Earth Science Chapter 9 Section 2Student Notes

**Moving Water Carves a Path**

* The first condition necessary for stream formation is an adequate supply of water.
* The region where water first accumulates to supply a stream is called the headwaters.
* It is common for a stream’s headwaters to be high in the mountains.
* A **stream channel** forms as the moving water carves a narrow pathway into the sediment
or rock.
* **Stream banks**, the ground bordering the stream
on each side, hold the moving water within the confines of the stream channel.
* Headward erosion is the process by which small streams erode away the rock or soil at the head of the stream.
* Sometimes, a stream erodes its way through the high area separating two drainage basins, joins another stream, and then draws away its water.
* This process is called stream capture,
or stream piracy.



**Formation of Stream Valleys**

* As a stream actively erodes its path through the sediment or rock, a V-shaped channel develops.
* V-shaped channels have steep sides and sometimes form canyons or gorges.
* A stream continues to erode until it reaches its base level, the elevation at which it enters another stream or body of water.
* Over time, a V-shaped valley will be eroded into a broader valley that has gentle slopes.

**Meandering Streams**

* A stream’s slope, or gradient, decreases as it nears its base level, and as a result the channel gets wider.
* The decrease in gradient causes water to build up within the stream channel.
* Sometimes, the water begins to erode the sides of the channel in such a way that the overall path of the stream starts to bend or wind.
* A **meander** is a bend or curve in a stream channel caused by moving water.
* Water in the straight parts of a stream flows at different velocities, depending on the location of the water in the channel.
	+ In a straight length of a stream, water in the center of the channel is flowing at the maximum velocity.
	+ Water along the bottom and sides of the channel flows more slowly because it experiences friction as it moves against the land.



* The water moving along the outside of a meander curve experiences the greatest rate of flow within the meander.
	+ The water that flows along this outside part of the curve continues to erode away the sides of the streambed, thus making the meander larger.
	+ Along the inside of the meander, the water moves more slowly and deposition is dominant.



* It is common for a stream to cut off a meander and once again flow along a straighter path.
* The cut off meander becomes an oxbow lake, which eventually dries up.
* As a stream approaches its ultimate end point, the ocean, the streambed’s gradient flattens out and its channel becomes very wide.
* The mouth is the area of the stream that leads into the ocean or another large body of water.

**Deposition of Sediments**

* A stream’s velocity lessens and its sediment load drops when its gradient abruptly decreases.
* In dry regions, a stream’s gradient may suddenly decrease causing the stream to drop its sediment as a fan-shaped deposit called an *alluvial fan*.
* Alluvial fans are sloping depositional features formed at the bases of slopes and composed mostly of sand and gravel.
* Streams also lose velocity and the ability to carry sediment when they join larger bodies of quiet water.
* A **delta** is the triangular deposit, usually consisting of silt and clay particles, that forms where a stream enters a large body of water.

**Rejuvenation**

* Downcutting, or the wearing away of the streambed, stops when the stream reaches its base level.
* If the land over which the stream is flowing uplifts or if the base level lowers, the stream undergoes rejuvenation.
* During **rejuvenation**, a stream actively resumes the process of downcutting toward its base level.
* If rejuvenation occurs in an area where there are meanders, deep sided canyons are formed.