

Lesson – Erosion & Deposition by Running Water

THE FOLLOWING VIDEO HAS BEEN APPROVED FOR ALL AUDIENCES BY THE EARTH SCIENCE TEACHERS ASSOCIATION OF AMERICA, INC.

THE VIDEO HAS BEEN RATED

1	INTELLIGENT
	UNDER 15 REQUIRES TEACHER ASSISTANCE

STRONG EARTH SCIENCE LANGUAGE, DETAILED DIAGRAMS, AND SAFE AWARENESS.

- I can explain how running water transports sediment
- I can describe stream velocity
- I can illustrate where erosion & deposition takes place on a meandering river
- I can describe the two main ways running water sorts sediments
- I can define features made by a river

### RUNNING WATER

• Most **COMMON AGENT** of EROSION

**DISSOLVED MINERALS**  
Carried in solution

**SMALL SEDIMENTS**  
Carried **SUSPENDED** in water

**LARGE SEDIMENTS**  
Carried by rolling, sliding, or bouncing




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### STREAM VELOCITY


3 FACTORS EFFECTING:

- 1) **GRADIENT** (steepness of the slope)
- 2) **DISCHARGE** (Volume)
- 3) Stream Channel **SHAPE**

During Flood



After Flood

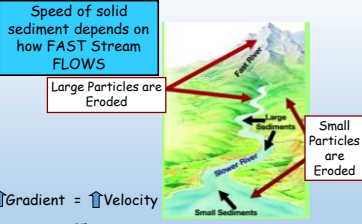


Speed of solid sediment depends on how **FAST** Stream **FLOWS**


Large Particles are Eroded

Small Particles are Eroded

↑ Gradient = ↑ Velocity  
or  
↑ Slope = ↑ Velocity



Kinetic energy **HIGH** = Erosion  
-Occurs in regions of **STEEP SLOPE** or **HIGH DISCHARGE**

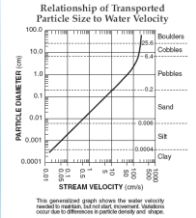


Kinetic energy **LOW** = Deposition  
-Occurs in regions of **GENTLE SLOPE** or **LOW DISCHARGE**

### GREATER VELOCITY

LARGER SEDIMENT Particles it can CARRY

Relationship of Transported Particle Size to Water Velocity




100.0 Boulders  
10.0 Cobbles  
1.0 Pebbles  
0.1 Sand  
0.01 Silt  
0.001 Clay

1000 100 10 1 0.1 0.01 0.001

1000 100 10 1 0.1 0.01 0.001

This generalized graph shows the water velocity needed to transport, but not just, erode them. Velocities could have differences in particle strength and shape.

Size of the shot could be 1/2 inch or 1/4 inch. You could throw a baseball or a tennis ball. You could throw a brick.




**GRAVEL** **SAND** **SILT** **CLAY**



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Other Factors for Stream Velocity

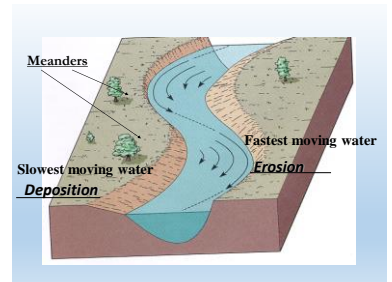
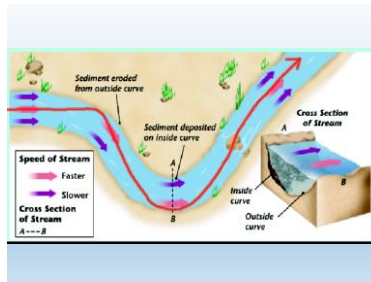
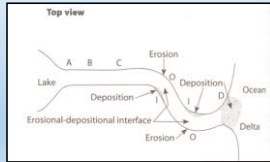
**STREAM DIRECTION**  
 CHANNEL is STRAIGHT  
 - MAXIMUM velocity is **CENTER** of stream  
 CHANNEL CURVES  
 - MAXIMUM velocity shifts to **OUTSIDE** of curve  
**DEPTH**  
 -Greatest velocity just **BELOW** the SURFACE of water

**Meander**  
 Curve in a river

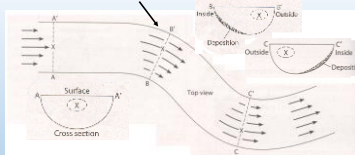


**EROSION & DEPOSITION** occur at:

- 1) Meanders in a stream
- 2) Between the source & the mouth of stream
- 3) Stream changes slope



**MEANDER**



**X = Region of MAXIMUM VELOCITY**  
**Arrow length proportional to Stream Velocity**

Use this slide to help you label your notes, remember this image is NOT the same as in your notes packet.

Now you know what side of the river to build your home.



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### Sorted Sediments

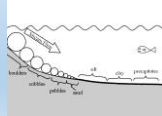
- Particles similar in size (or density, or shape)

**Graded Bedding:**  
water settles out fast (flooding)



Medina, NY

**Horizontal Sorting:**  
when a mixture settles out gradually (enters a lake)

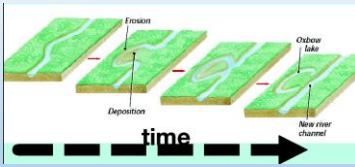


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### Features of Streams



### Evolution of a River



**Oxbow Lake**  
Curved section of river channel that have been abandoned by the river



**Watershed**  
Area of Land drained by any one stream

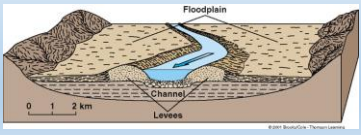


**V-Shaped Valley**  
Valley Eroded by stream or river

### Deposition by Stream

**Natural Levee**  
Gently sloping deposits created by repeated floods

**Flood plain**  
Nearly level land where sediments gets deposited during flooding



**Delta**  
Deposition of sediment where a river empties into another body of water

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