

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Period: \_\_\_\_\_

# Surface Processes

The Physical Setting: Earth Science

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## Class Notes: Surface Processes

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### I. Weathering and Soils

- Weathering - \_\_\_\_\_  
\_\_\_\_\_
- Sediments - \_\_\_\_\_  
\_\_\_\_\_
- Weathering occurs when rocks are exposed to:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
- Chemical Weathering - \_\_\_\_\_  
\_\_\_\_\_
  - The rate of chemical weathering increases in \_\_\_\_\_ and \_\_\_\_\_ climates
- Oxidation - \_\_\_\_\_  
\_\_\_\_\_
- Effects of Water on Rock
  - Sometimes called the \_\_\_\_\_, because given enough time water can dissolve nearly everything
  - Water can combine with \_\_\_\_\_ to form carbonic acid
  - Carbonic acid can dissolve most rock --- especially \_\_\_\_\_
- Sinkhole - \_\_\_\_\_  
\_\_\_\_\_

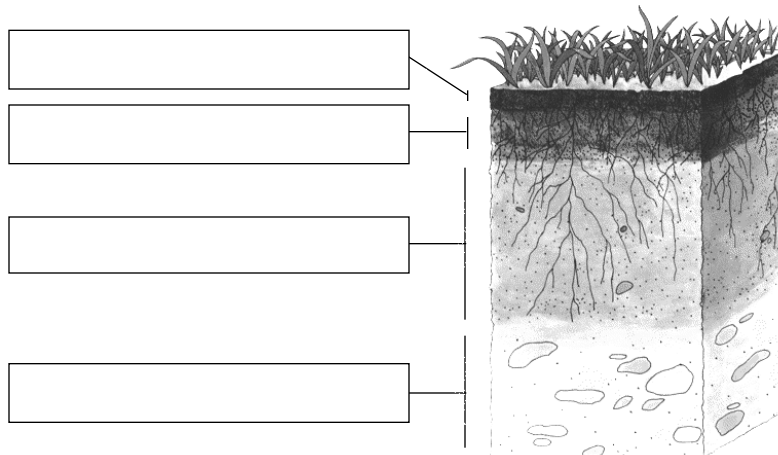
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# Class Notes: Surface Processes

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- Physical Weathering - \_\_\_\_\_  
\_\_\_\_\_
- Abrasion - \_\_\_\_\_  
\_\_\_\_\_
  - Characteristics: \_\_\_\_\_
  - Occurs as sediment are moved by ice, running water, gravity, or air
- Frost Action - \_\_\_\_\_  
\_\_\_\_\_
  - Water \_\_\_\_\_ cracks in the bed rock and when it freezes it expands \_\_\_\_\_ causing the rock to split apart
  - Infiltration - \_\_\_\_\_  
\_\_\_\_\_
- Plant Root Growth - \_\_\_\_\_  
\_\_\_\_\_
- Abrupt Temperature Changes - \_\_\_\_\_  
\_\_\_\_\_
- Physical and chemical weathering processes are important in the formation of soil
- Soil is a mixture of weathered rock particles and \_\_\_\_\_ that supports rooted plants
- Humus - \_\_\_\_\_  
\_\_\_\_\_

- Soil Layers



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# Class Notes: Surface Processes

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## II. Erosion and Deposition

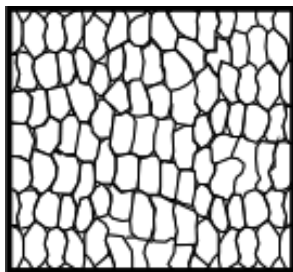
- After rocks are broken up from weathering they need to be moved
- Erosion - \_\_\_\_\_  
\_\_\_\_\_
  - Over time erosion helps \_\_\_\_\_ and \_\_\_\_\_ all surface features
- Agents of Erosion - \_\_\_\_\_  
\_\_\_\_\_
  - Examples of Agents of Erosion:
    - \_\_\_\_\_
    - \_\_\_\_\_
    - \_\_\_\_\_
    - \_\_\_\_\_
    - \_\_\_\_\_
  - Gravity --- \_\_\_\_\_
    - Force behind most agents of erosion
    - Causes rivers to flow, ice to move, and rocks to slide
  - The Sun --- \_\_\_\_\_
    - Drives the water cycle which produces rain and ice
    - Fuels winds and drives ocean currents

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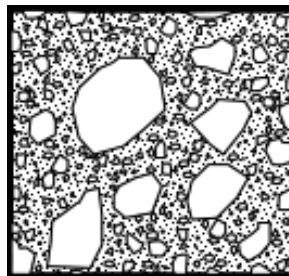
# Class Notes: Surface Processes

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- Deposition - \_\_\_\_\_  
\_\_\_\_\_
  - Sediments are deposited in locations where they form layers of sedimentary rock
- The sediment determines how fast they are deposited
  - Size - \_\_\_\_\_  
\_\_\_\_\_
  - Shape - \_\_\_\_\_  
\_\_\_\_\_
  - Density - \_\_\_\_\_  
\_\_\_\_\_
- Sorted Sediment - \_\_\_\_\_  
\_\_\_\_\_
  - Example: deposition from a stream
- Unsorted Sediment - \_\_\_\_\_  
\_\_\_\_\_
  - Example: deposition from a glacier



Sorted Sediment



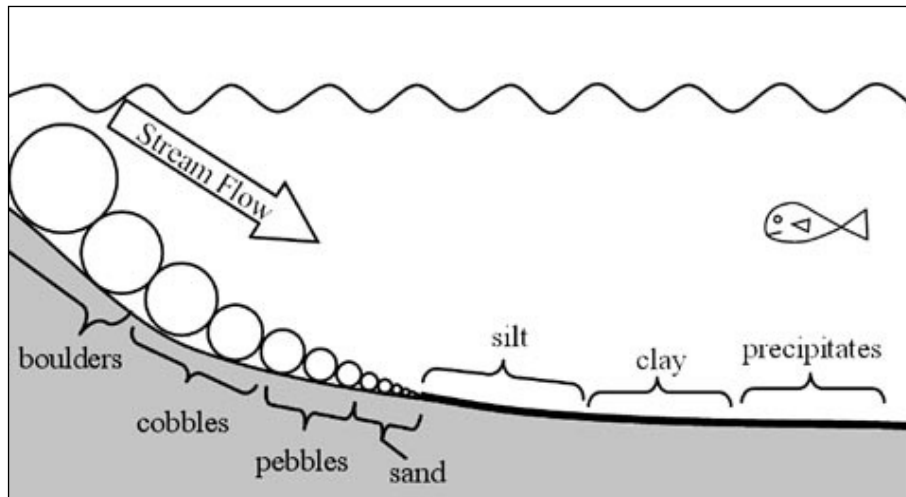
Unsorted Sediment

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# Class Notes: Surface Processes

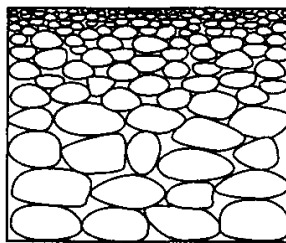
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- Horizontal Sorting - \_\_\_\_\_
- 



- Vertical Sorting - \_\_\_\_\_
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- Example: as a stream slows down throughout the year it can no longer transport larger material and begins to deposit the sediments according to size order



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# Class Notes: Surface Processes

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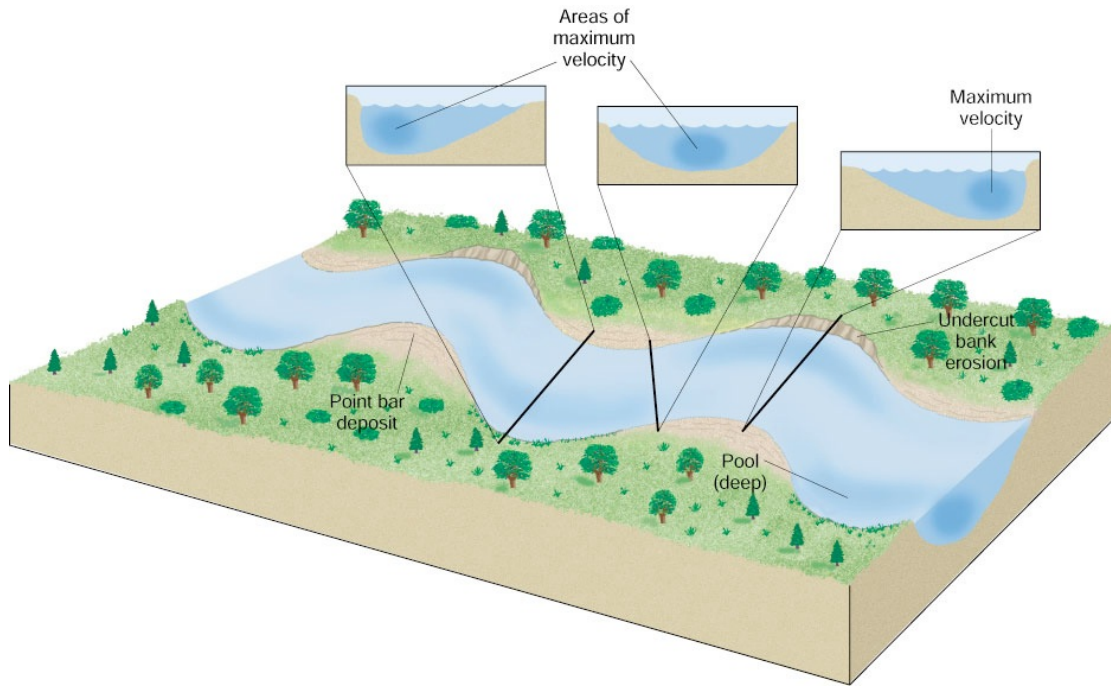
## III. Running Water

- Running water is the most common agent of erosion
- Stream - \_\_\_\_\_  
\_\_\_\_\_
- Tributary - \_\_\_\_\_  
\_\_\_\_\_
- Flood Plain - \_\_\_\_\_  
\_\_\_\_\_
- Levee - \_\_\_\_\_  
\_\_\_\_\_
  
- Stream carry sediment in various ways:
  - \_\_\_\_\_
  - \_\_\_\_\_
  - Larger particles are usually carried by \_\_\_\_\_, \_\_\_\_\_  
\_\_\_\_\_ along the stream bottom
  
- Stream Velocity - \_\_\_\_\_
  - Gradient - \_\_\_\_\_
  - Discharge - \_\_\_\_\_  
\_\_\_\_\_
  - Channel Shape - \_\_\_\_\_  
\_\_\_\_\_
  
- Variations in Stream Velocity:
  - When a stream channel is straight the greatest velocity is in the \_\_\_\_\_
  - When a stream channel curves the greatest velocity is on the \_\_\_\_\_  
of the curve

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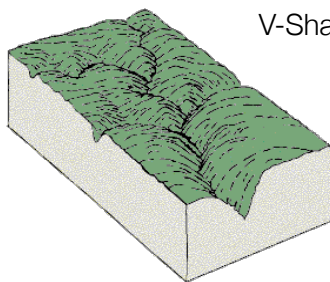
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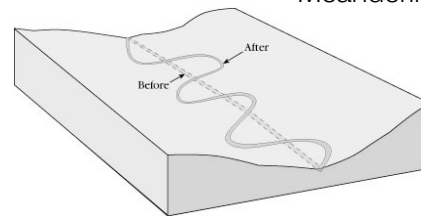


- Stream Characteristics:

- V-Shaped Valley - \_\_\_\_\_  
\_\_\_\_\_
- Meanders - \_\_\_\_\_  
\_\_\_\_\_



V-Shaped Valley



Meandering Stream

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## IV. Glaciers

- Glacier - \_\_\_\_\_  
\_\_\_\_\_
- Glacier Movement:
  - As snow and ice \_\_\_\_\_ the glacier moves \_\_\_\_\_  
under its own mass and the pull of gravity
  - Sometimes called a “\_\_\_\_\_” glaciers act like fluids  
and flow in a \_\_\_\_\_ motion
- Types of Glaciers:
  - Continental Glacier - \_\_\_\_\_  
\_\_\_\_\_
  - Valley Glacier - \_\_\_\_\_  
\_\_\_\_\_
- Glacial Features:
  - U-Shaped Valleys - \_\_\_\_\_  
\_\_\_\_\_
  - Erratics - \_\_\_\_\_  
\_\_\_\_\_
  - Drumlins - \_\_\_\_\_  
\_\_\_\_\_
  - Eskers - \_\_\_\_\_  
\_\_\_\_\_
  - Terminal Moraines - \_\_\_\_\_  
\_\_\_\_\_
  - Till - \_\_\_\_\_  
\_\_\_\_\_



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- Glacial Grooves - \_\_\_\_\_

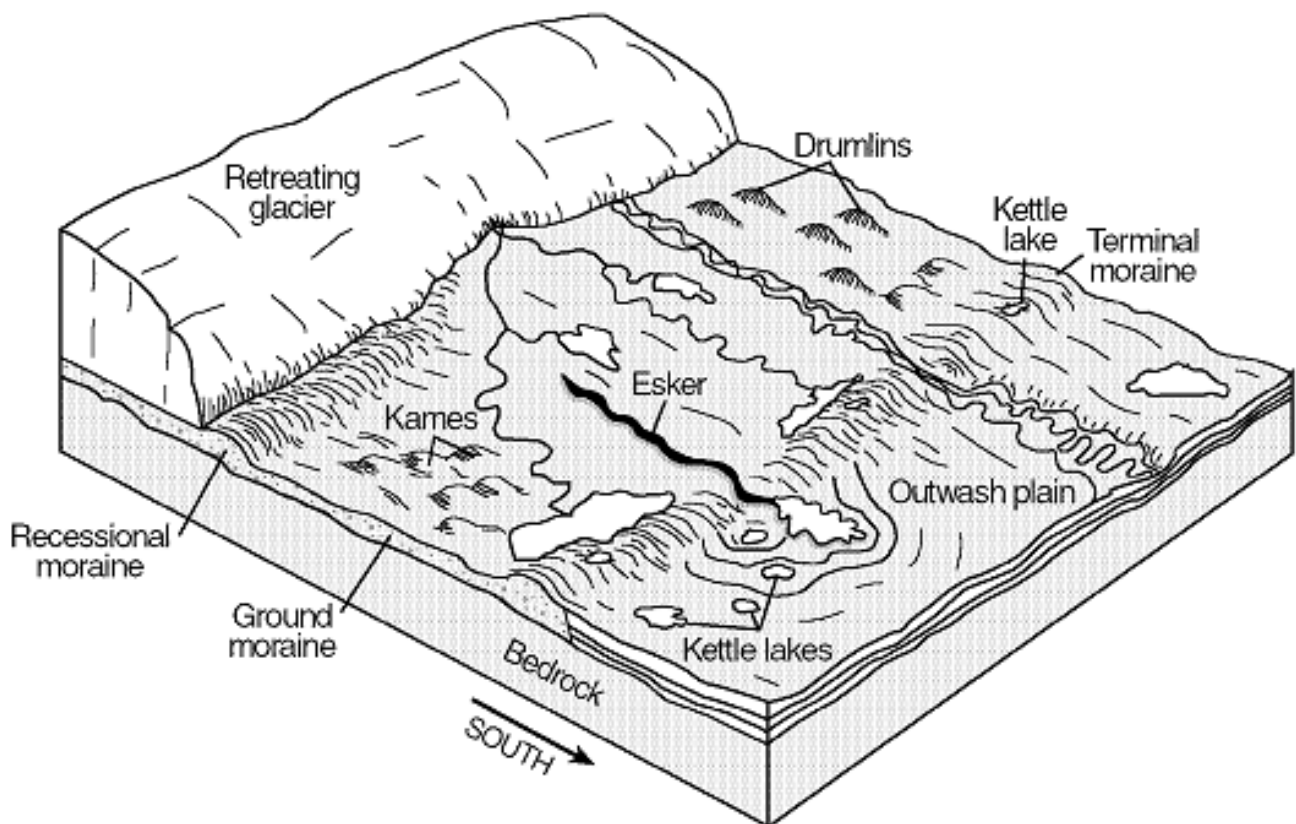
- The grooves indicate the direction the glacier has traveled

- Kettle Lake - \_\_\_\_\_

- Example: Lake Ronkonkoma

- Outwash Plain - \_\_\_\_\_

- Example: Southern Long Island



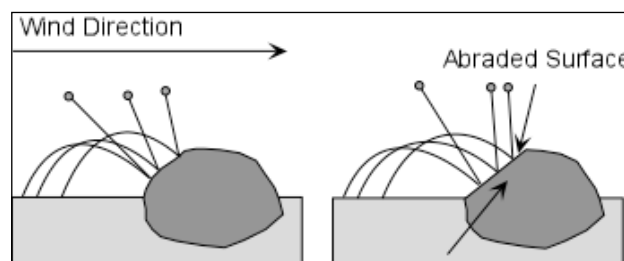
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# Class Notes: Surface Processes

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## V. Mass Movement, Waves, & Wind

- Mass Movement - \_\_\_\_\_  
\_\_\_\_\_
  - Characteristics: unsorted sediment
  - Mass Movement Examples:
    - \_\_\_\_\_
    - \_\_\_\_\_
    - \_\_\_\_\_
  - The sediment determines how fast they are deposited
    - Gravity - \_\_\_\_\_  
\_\_\_\_\_
    - Friction - \_\_\_\_\_  
\_\_\_\_\_
  - When rain weakens the force of friction gravity then pulls rock and sediment down a slope
- Wind - \_\_\_\_\_  
\_\_\_\_\_
  - Wind picks up loose sediment such as sand and silts and carries them to a new location
- Deflation - \_\_\_\_\_  
\_\_\_\_\_

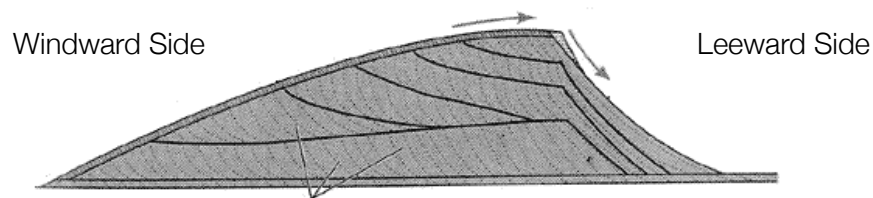


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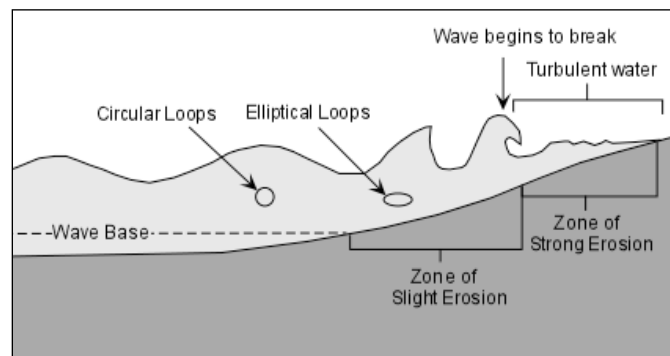
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- Abrasion - \_\_\_\_\_  
\_\_\_\_\_
- Sand Dune - \_\_\_\_\_  
\_\_\_\_\_
  - Windward Side: \_\_\_\_\_
  - Leeward Side: \_\_\_\_\_



Waves - \_\_\_\_\_  
\_\_\_\_\_

- As \_\_\_\_\_ pushes a wave toward the shore, it drags along the bottom of the ocean floor
- The dragging slows the bottom of the wave, but the top continues at the same speed
- Eventually the wave becomes unstable and “ \_\_\_\_\_ ”



- Waves approach the shore at an angle, but retreat parallel to the shore, creating a zigzag pattern
- Long Shore Current - \_\_\_\_\_  
\_\_\_\_\_