

# PHYSICAL GEOLOGY LABORATORY

## Stream Processes (modified from Fetter and Muldoon, 2008)

### Objectives:

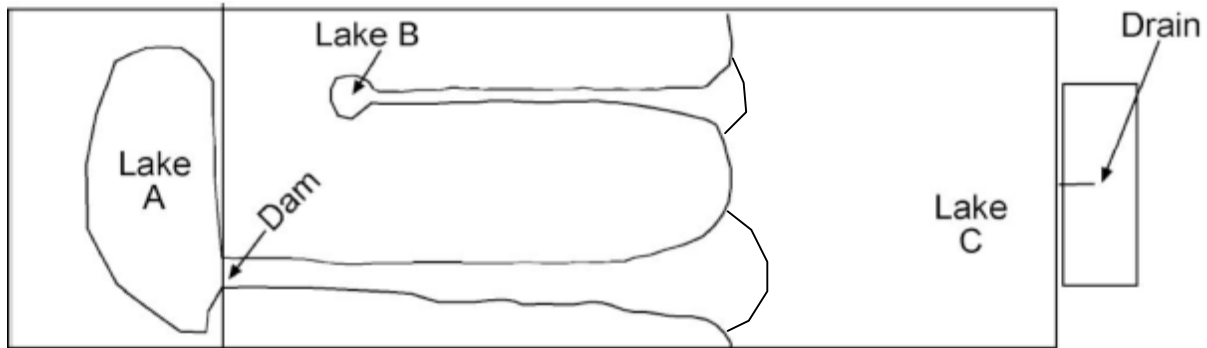
1. To observe the processes of erosion, transportation, and deposition by running water.
2. To be able to predict how stream processes will affect a stream channel through time.
3. To observe the inter-relation between groundwater and surface water.
4. To observe formation of a delta.

### Definitions:

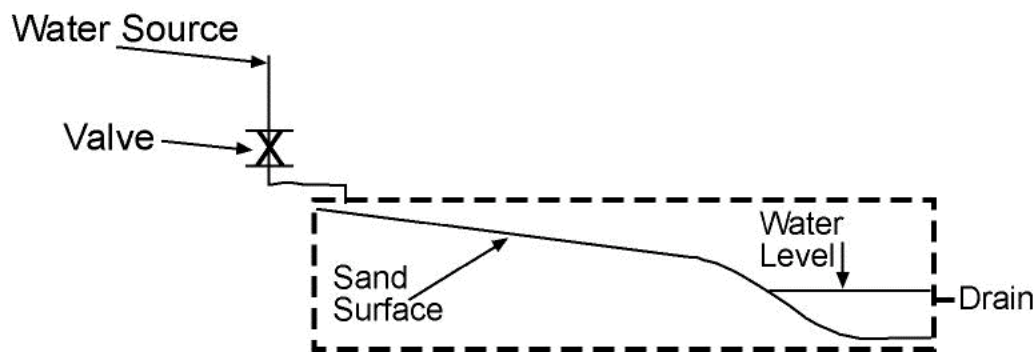
Bed Load	Sediment rolling and sliding on the bottom of a stream.
Suspended load	Sediment in suspension due to turbulence.
Channel	The trough through which a stream flows.
Floodplain	The low flat area surrounding the river channel that floods when the river overflows its banks
Meander	A bend in a stream where the stream is actively eroding the outside bank while depositing sediment along the inside bank.
Gradient	The slope of the river.
Point Bars	Shallows on the inside bank of meanders, developed by deposition.
Base Level	The lowest level to which a stream can erode. <i>Ultimate base level</i> is the ocean, but <i>local base levels</i> such as lakes may also exist.
Competence	The maximum size particle that can be transported.

**Stream Table:**

The stream table will have a moderate amount of water flowing, creating three lakes, one impounded by a dam (Lake A), another impounded in the lower end of the tank (Lake C), and a third with no tributary channel draining into it (Lake B). There will be a large rock in the middle of the channel below the dam.



**Figure 1.** Top view of stream table.



**Figure 2.** Side view of stream table.

**Groundwater / Surface Water Relationships**

QUESTION: What is the elevation of the water in the lakes?

ANSWER: \_\_\_\_\_ inches in lake A  
\_\_\_\_\_ inches in lake B  
\_\_\_\_\_ inches in lake C

QUESTION: What do the relative water levels in all the lakes tell about the direction of groundwater flow?

ANSWER: \_\_\_\_\_

QUESTION: Considering the water source for Lake B, what type of lake is it?

ANSWER: \_\_\_\_\_

QUESTION: From what sources is water flowing into Lake C?

ANSWER: \_\_\_\_\_

QUESTION: If the water source is shut off, what will happen to the water level in Lake A? In Lake B?

ANSWERS: \_\_\_\_\_

### **Erosion and Deposition of Sediment**

Streams erode sediment by downcutting and by lateral erosion. Observe the stream carefully and note 1) where sediment is being eroded, 2) where sediment is being transported and 3) where sediment is being deposited.

QUESTION: Is the stream downcutting?

ANSWER: \_\_\_\_\_

QUESTION: Is the stream eroding laterally? If so, does this happen closer to the head or the mouth?

ANSWER: \_\_\_\_\_

QUESTION: Is the stream competent to erode gravel?

ANSWER: \_\_\_\_\_

QUESTION: Is most of the sediment in the channels being transported as bed load or as suspended load?

ANSWER: \_\_\_\_\_

QUESTION: What is the local base level for the stream?

ANSWER: \_\_\_\_\_

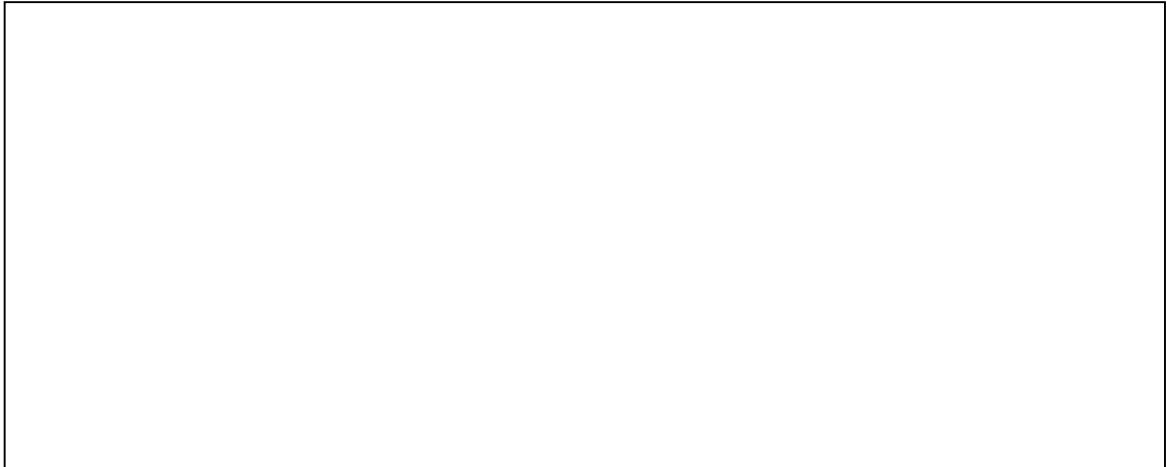
QUESTION: What happens to the sediment when it reaches Lake C?

ANSWER: \_\_\_\_\_

QUESTION: Explain why sediment is deposited at the stream's mouth.

ANSWER: \_\_\_\_\_

QUESTION: Make a sketch map of the delta forming in Lake C, showing channels and deposits.



QUESTION: Are there any point bars forming?

ANSWER: \_\_\_\_\_

QUESTION: Are point bars on the inside or outside bank of meanders?

ANSWER: \_\_\_\_\_

QUESTION: Is velocity high or low in the area of point bar deposition?

ANSWER: \_\_\_\_\_

QUESTION: Explain why sediment is deposited on the point bars.

ANSWER: \_\_\_\_\_

QUESTION: Sketch a section of the stream valley containing a meander and indicate with arrows the direction of flow. **Make long arrows for high velocity and short arrows for low velocity. Also label the following:**  
1) point bar, 2) undercut banks, 3) floodplain

