

Activity 2. Stream Velocity and Erosion

Objectives:

- To observe how much erosion and deposition can be caused by a stream, depending on how fast or slow the stream is flowing.
- To learn how to conduct an experiment.

Background: Sediment is eroded from the top of a watershed by a stream and its tributaries. That sediment is then deposited at the mouth of the stream, located in the bottom portion of a watershed. The amount of erosion and deposition that occurs can be determined by measuring how large the stream's delta grows over time.

List of materials:

- Stream table with running pump that can pump at least 3 different speeds
- Stopwatch
- A defined stream (same size and shape for each trial - Why?!)
- A ruler or other tool for measuring delta formation
- Pencil
- Calculator

Procedure:

1. Examine the **Question** found below and develop a hypothesis from it.
2. Under **Methods**, design an experiment that could test your hypothesis. Your design should include at least the following:
 - Conduct at least three trials with the same stream shape each time at a slow, medium and fast pump speed
 - Conduct each trial for the same amount of time (Why?!)
 - Measure the “volume” of the delta after each trial in centimeters (length x width x height)
 - Record data
 - Return the sediments to the top of the watershed after each trial (Why?!)
3. Construct your defined stream on the stream table (straight and narrow works well)
4. Assign the needed roles in your group (these should stay the same through the whole experiment to keep data collection consistent):
 - Pump operator
 - Time keepers
 - Delta measurer
 - Data recorder
 - Engineer to keep the same stream size and shape and to redistribute the sediments
5. Carry out the Experiment that you designed under the **Methods** section.
6. Determine if your hypothesis was correct.
7. Answer follow-up questions.

Question: How does the velocity of a stream affect how much erosion and ultimately deposition occurs?

What is your **hypothesis**?

Methods:

Explain how you will test your hypothesis.

What are your **independent and dependent variables**?

What will you be keeping **constant** in your experiment?

Observations: Record what happens. Provide any **measurements** in a table.

Results/Conclusion:

Was your **hypothesis** correct? Explain.

Follow-up questions

1) What do you think would happen if we increased or decreased this stream's slope (make it steeper or flatter) instead of the speed of the pump?

2) What events in nature did the speed of the pump represent in this experiment? Hint: Think about weather and climate.

3) How do people try to control rivers and streams in "real life?" How would engineers keep a real stream from changing its size or course?