# Pre-Lab Information

Purpose To model and observe stream processes, including factors that affect erosion and deposition.

Time Approximately 45 minutes

Question What factors affect the power of a river to cause erosion?

Summary In this activity, you will use a stream table to model stream processes and observe stream behavior. Using sand, pebbles, and variously sized rocks, you will investigate how water velocity, the gradient of the stream table, and the size of sediment affect erosion in a stream. You will also adjust water volume to simulate normal and flooding conditions. Finally, you will draw your observations in the Data section of this guide.

# Safety

* Behave in a purposeful manner in the lab at all times.
* Keep water inside the stream table.
* Immediately clean up any spilled water or sand to avoid slip and falls.
* Do not wash sand into the sink drain.
* Report all accidents—no matter how big or small—to the teacher.

# Lab Procedure

1. **Gather materials.**

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| --- | --- | --- |
| * Stream table * (Two) gallon water containers * Sand | * Smaller pebbles * Larger rocks * Meterstick | * Several books * Large bucket * Paper towels |

1. **Prepare the stream table.**
   1. Fill the stream table with sand.
   2. Create a stream channel, with some curves. Then place pebbles and rocks into the stream channel and banks of the stream.
   3. Using books and a yardstick, arrange your stream table so that one end is 15 cm above the other.
   4. Place a bucket beneath the drainage hole.
2. **Model a low gradient, low velocity stream.**
   1. Slowly and gently pour water into the stream channel at the raised end of the table. Pour a gallon of water into the stream channel.
   2. Observe the water as it travels down the stream channel.
   3. After the water has drained, draw the surface of the stream table in Table A in the **Data** section of this guide. Make sure to take note of what happened to the small pebbles and larger rocks.
   4. After completing your drawing, smooth out the sand and recreate your stream channel.
3. **Model a low gradient, high velocity stream.** 
   1. Lower the raised end of the stream table back to 15 cm above the other.
   2. Quickly pour water into the stream channel at the raised end of the table. Make sure the water is coming out of the container much faster than during Step 3. Pour a gallon of water into the stream channel.
   3. Observe the water as it travels down the stream channel.
   4. After the water has drained, draw the surface of the stream table in Table B in the **Data** section of this guide. Make sure to take note of what happened to the small pebbles and larger rocks.
   5. After completing your drawing, smooth out the sand and recreate your stream channel.
4. **Model a high gradient, low velocity stream.**
   1. Using books and the yardstick, arrange your stream table so that one end is 45 cm above the other.
   2. Slowly and gently pour water into the stream channel at the raised end of the table. Pour a gallon of water into the stream channel.
   3. Observe the water as it travels down the stream channel.
   4. After the water has drained, draw the surface of the stream table in Table C in the **Data** section of this guide. Make sure to take note of what happened to the small pebbles and larger rocks.
   5. After completing your drawing, smooth out the sand and recreate your stream channel.
5. **Model a high gradient, high velocity stream.** 
   1. Using books and the yardstick, arrange your stream table so that one end is 45 cm above the other.
   2. Quickly pour water into the stream channel at the raised end of the table. Make sure the water is coming out of the container much faster than during Steps 3 and 4. Pour a gallon of water into the stream channel.
   3. Observe the water as it travels down the stream channel.
   4. After the water has drained, draw the surface of the stream table in Table D in the **Data** section of this guide. Make sure to take note of what happened to the small pebbles and larger rocks.
   5. After completing your drawing, smooth out the sand and recreate your stream channel.
6. **Model a low gradient, high volume stream.** 
   1. Lower the raised end of the stream table back to 15 cm above the other.
   2. Pour both gallons of water at the same time into the stream channel at the raised end of the table. Make sure the water is coming out of the container much faster than during Steps 3 and 4. Pour both full gallons of water into the stream channel.
   3. Observe the water as it travels down the stream channel.
   4. After the water has drained, draw the surface of the stream table in Table E in the **Data** section of this guide. Make sure to take note of what happened to the small pebbles and larger rocks.
7. **Clean up your area.** 
   1. Return materials and dispose of any trash according to your teacher’s instructions.
   2. Make sure to use the paper towels to clean up any spilled water and sand.
   3. Dispose of wastewater in the buckets according to your teacher’s instructions.
   4. Do not pour sand down the sink drain.

# Data

Record your observations either in your lab notebook or in the space below.

**Table A**

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| --- |
| **Drawing of low gradient, low velocity stream** |
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**Table B**

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| --- |
| **Drawing of low gradient, high velocity stream** |
|  |

**Table C**

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| --- |
| **Drawing of high gradient, low velocity stream** |
|  |

**Table D**

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| --- |
| **Drawing of high gradient, high velocity stream** |
|  |

**Table E**

|  |
| --- |
| **Drawing of low gradient, high volume stream** |
|  |

# Follow-Up Questions

Answer the following questions:

1. Compare and contrast your drawings in Table A and Table C. How did changing the gradient of the stream table affect velocity? What does changing the gradient represent in a natural environment?
2. Compare and contrast your drawings in Table C and Table D. How did the increased velocity affect erosion and the movement of sediment? What factors in nature might affect the velocity of a stream?
3. Compare and contrast your drawings in Table A and Table E. How did the increased water volume affect the rate of erosion? How did the increased water volume affect stream velocity? What might this increased water volume represent in a natural environment?