

# STREAM TABLES

## Activity 5

### Introduction:

Many people use streams and rivers as their water supply. In addition, people have historically used rivers for a variety of purposes, including travel, drinking water supplies, and removal of waste materials. In this activity, you will explore how water flow in streams affects the dispersal of pollutants.

### Objectives: Upon completion of this activity, the student should be able to . . .

1. Identify at least two types of stream paths
2. Name at least three factors that affect the path a stream takes
3. Describe the effects of each of the three factors in objective #2 on the type of path a stream makes
4. Describe the path ground pollutants take when near and in a stream or river

### IL State Standards: The IL State Standards addressed by this activity are . . .

- 12.E.3a – Analyze and explain large-scale dynamic forces, events and processes that affect the earth's land, water, and atmospheric systems.
- 13.B.3d – Analyze the interaction of resource acquisition, technological development and ecosystem impact

### Materials:

- |   |                                      |
|---|--------------------------------------|
| 1 Wallpaper tray or square dish pan     | 1 Gallon of fine sand                |
| 2 Wood blocks same size                 | 1 Long wood block for smoothing sand |
| 3 One-gallon buckets                    | 1 Plastic cup for dipping            |
| 1 Tube, narrow and flexible, 60 cm long | 1 Paraffin or plastic block          |
| 1 Acetate or plastic dam                | 6 Cotton swabs                       |
| 1 Box food coloring                     | Paper towels and water               |

### Procedures:

- A. For this run, re-set the tray as it was for Activity 1. Be sure to smooth out the sand. Then, make a shallow trough with your finger to help the stream path form. Try to make a meander pathway.
- B. Get four cotton swabs. Place a drop of food coloring on one tip of each of swab (you may use different colors if you like). The food coloring represents pollutants, and the swabs represent wells or deposits (like landfills) where pollutants collect.
- C. Insert the colored ends of the cotton swabs into the sand. The swabs should be “stuck” into the sand so they stand up like posts. Place them at differing distances from the stream path. For example, the one closest to the “top end” of the tray can be placed near the side of the tray, the second one down the tray can be placed about 6 cm from the stream, the next one 3 cm from the stream, and the last one (nearest the “bottom end” (see Figure 1 on the next page).
- D. Begin the water flow, and observe what happens to the colors from the cotton swabs. Record your observations in Part A of the Data Sheet.
- E. Next, repeat the procedures, but vary different characteristics of the stream to see what effects those changes may have on the movement of pollutants. For example, change the slope of the stream, increase the amount of water flow, add a dam, etc. Record your observations in Part B of the Data Sheet.

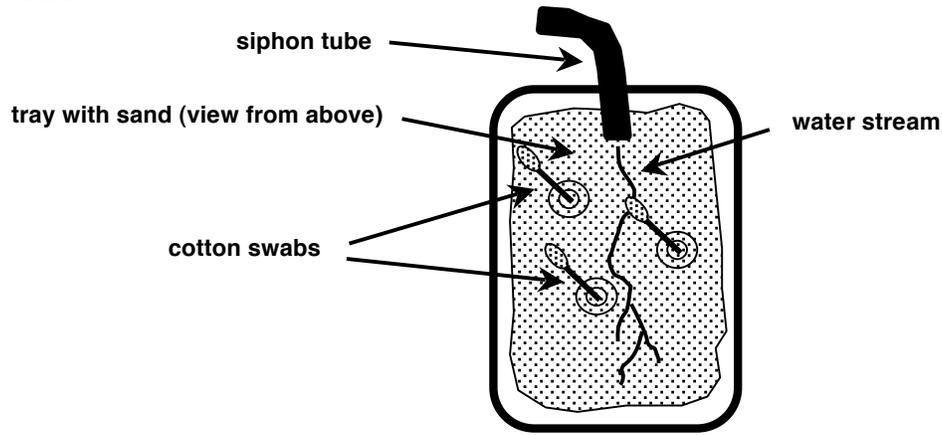


Figure 1

**Data Sheet:**

**Activity #5: "With ground pollutants"**

Part A Observations:

Draw the stream path with pollutants' trace:

**Activity #5: "With ground pollutants"**

Part B: Observations (continue on back of page if needed):

**Questions:**

1. In this activity, you examined the movement of ground pollutants.
  - a. What happens to a concentration of pollutants when ground water makes contact with them?
  - b. In what direction do ground pollutants move when a stream is nearby?
  - c. Consider your answers for 5a and 5b above. If you were to construct a landfill to hold toxic materials, what would be one important factor to consider for its location?
2. Would injecting pollutants into wells near a stream alter the stream's path of flow? Explain your answer.
3. How does increasing the slope, or steepness, or a stream affect the path pollutants may make with respect to the stream?
4. How does increasing the amount of water flowing through the stream effect on the flow of the pollutant with respect to the stream? Explain why you think this would occur.
5. In the third activity, you examined the effects of damming a stream. What do you think the effects of a dam would be on the movement of pollutants in a stream? Explain why you think this.

**Resource:** Great Exploration in Math and Science. (1989). *River cutters*. Berkeley, CA: Lawrence Hall of Science, California State Board of Regents.