

X-Stream Exploration II**Ages:** Grades 9+**Time:** 1 ½-2 hours**No. of participants:** 8-12**No. of additional adults:** 1+**Required supplies:**

- Stream Study recording sheet (1 per student)
- Clipboard (1 per student)
- Pencils (1 per student)
- thermometer
- nets of assorted sizes in a carrying container
- sieves (1 per student)
- collection bins
- rubber boots or water shoes if possible - *Let people participating know beforehand that they will be going into the creek and should dress appropriately and wear something on their feet that can get wet. Participants should also bring a towel.*
- large seine net
- laminated Macroinvertebrates identification sheets (1 per student if possible)
- ice cube trays for sorting labeled Sensitive, Somewhat Sensitive, Tolerant

Objective: To get into the Drift Creek and find, collect, identify and classify living organisms in the creek, specifically macroinvertebrates. Use a Macroinvertebrate field guide to identify collected specimens. Sort macroinvertebrates according to Bio-indicators. Determine overall health of the stream using a data collection table.

Lesson Plan Procedures**1. Introduction:**

- a. Today we will be actually getting into the Drift Creek and collecting living organisms from it while learning more about the complex ecosystem we'll be exploring!
- b. Before we go I need to remind you to be safe during this activity; the rocks are very slippery - no horsing around! Also, we will have more luck collecting things if we are quiet. So please, no splashing, jumping, or running through the water. Everybody understand? Good, let's go down to the stream!
- c. *Divide up the supplies among the students - go to preselected creek location.*

2. Beginning Instructions (Part I)

- a. Pass out a Stream Study recording sheet, clipboard, and pencil to each student.
- b. Explain how the first thing you will do is fill in some of the information together.
 - i. Stream - Drift Creek
 - ii. Site Number - varies
 - iii. City - Lincoln City
 - iv. State - Oregon
 - v. Collection date - day of lesson
 - vi. Collectors - student's name
 - vii. Weather conditions last 3 days - discuss
 - viii. Average depth - pre-calculated to save time, explain procedure
 - ix. Average width - pre-calculated to save time, explain procedure
 - x. Stream water temp. - place thermometer in water for reading
 - xi. Stream-flow - varies

- xii. Stream appears - varies
- c. Collect sheets - explain they will be used again in the second part of the lesson.
- d. Continue by saying - Each of you will need one of these sieves which you will use to collect specifically aquatic insects (macroinvertebrates) from the creek today - pass out.
- e. Here are some helpful techniques for collecting them - try these as well as some that you come up with. (Show them, as well as tell them.)
 - i. Stir up the mud/sand by the edge of the creek bed and then use your sieve to scoop around in this water.
 - ii. Set your sieve firmly on the bottom of the creek bed and then lift a rock up directly upstream from it. Swish around the in the water with your hand, pushing what was under the rock into your sieve.
- f. As you find different organisms, put them in one of these large collection containers. Be sure to look closely in your sieve before dumping it out - many of the organisms are quite small!
- g. You will have the next _____ minutes (20 minutes should be sufficient) to search around this area of the stream.
- h. Before ending, make a couple runs with the seine net. Repeat until each student who would like to has had a chance to hold one side of the net while the other students splash around upstream.
- i. At this point, get everyone out of the creek - allow them to dry off with their towels while the collection specimens and supplies are organized. (Wrap up at the creek allowing at least 20 minutes for identification.)

3. Main Lesson (Part I)

- a. At this point you will want to take all of the supplies from the creek and move the students to a location with tables. Have the students sit next to a partner.
- b. Hand out a macroinvertebrate identification sheet to each pair.
- c. Ask each pair to retrieve one specimen from the bin with a small net for closer inspection.
- d. Using their macroinvertebrate sheet, have them identify the aquatic insect they have.
- e. After identifying the organism, it should be placed into an individual compartment in the appropriate ice cube tray. Each tray should be pre-labeled to represent a group of Bio-indicators - Sensitive, Somewhat Sensitive, Tolerant.
- f. Repeat this until all of the aquatic insects have been sorted.
- g. At this time, hand back their Stream Study recording sheets and gather as group to complete the paper. Check off numbers and types of macroinvertebrates found in each category together.
- h. Then, do the math to determine the water quality rating of Drift Creek.

4. Conclusion:

- a. Discuss conclusions, questions, etc. Possible topic - how do humans influence water quality?
- b. Lesson extension option: Watch and discuss the Macroinvertebrates slide show.
- c. Put all specimens back into the bins and have volunteers return them to the creek. Clean up all areas and supplies.