



Field Testing Procedures and Notes

1. How to Select Sites

Eastern Massachusetts offers many types of sites for collecting water samples: streams and rivers, lakes and ponds, fresh and salt water marshes, as well as bays, estuaries, harbors, and the ocean. Choosing from among these options should be a matter of convenience (what are you near?), safety (where can you collect samples safely?), and significance (what will have the most meaning for your class?).

If you select a site in your own community, you and your students may already know about convenient locations for taking samples, such as a swimming beach, boat launch or fishing dock. If you are interested in a site in another community, the town's municipal offices may be able to help locate a convenient access point.

2. Safety Considerations

Selecting a safe site may limit the places where you can collect samples. Find a site with enough room that all of your students will have easy access to the water. Your students should be able to collect samples without wading into the water. Before selecting a field site, inspect it yourself!

- Avoid places where the banks are slippery or steep, and where vegetation or rocks restrict access.

- Avoid places where the water moves swiftly or where waves are high.
- In estuaries, bays and along the sea shore, take the tides into account. A location that may look safe at low tide may pose dangers at high tide; a place that seems accessible at high tide may not be at low tide.
- Select sites that are removed from roads and highways. You do not want your students wandering into traffic - or traffic wandering into them!
- If you plan to collect samples from bridges, make sure the walkway is separated from the traffic and that there are safety rails on the bridge. (You will need ropes to haul up samples.) Students should not lean over the rails.
- If you use a boat, stress safety.

Before the site visit, give each student a copy of page 69 on *Student Safety*. It stresses the precautions for water safety practices and for doing the tests. If possible, take a chaperone along to help enforce these safety practices.

3. Performing Tests Safely

Performing the water quality tests requires handling both breakable equipment and hazardous chemicals. Students should practice the same safety precautions in the field as they do in the laboratory.

The kit contains Material Safety Data Sheets (MSDS) for each chemical. These contain all the safety information you will need, including dangers, treatments and disposal.

- Each student should have the proper protective equipment: aprons, gloves and eye protection.
- Be sure to have enough clean water on hand to flush chemicals in case of an accident.
- Dispose of chemicals properly.
- Have your students practice handling the equipment before the field test. (See *Chapter IV, Pre-Site Visit Preparation*, page 21.) They must be particularly cautious not to drop or break the equipment.

4. Choosing Sampling Locations

Test results will vary depending upon your sampling location. For example, the temperature, dissolved oxygen and turbidity level of water from the middle of a lake or harbor may differ from samples taken at the shore, and water from near the surface may differ

from water taken at mid-depths or from the bottom.

Safety and strategic considerations will probably prevent you from collecting samples at all locations. Nevertheless, you can achieve the goals of this program and relay a valuable educational lesson by taking samples at more accessible locations. Students will experience the hands-on science involved in the field tests, and they will become aware of the interconnections between water quality issues and human use. As part of your follow-up discussion, you can hypothesize how the water quality might differ at different locations.

If you have a choice of sampling locations, one may be more “representative” than another. For instance, water taken from a steep bank or a dock would probably be more indicative of the whole pond or bay than water in a shallow, protected cove. Testing samples from both sites might provide valuable comparisons.

5. Work To Be Completed in the Field

To ensure accurate results, only a few tests must be completed in the field. Once these tests are completed, you may bring the remaining sample water to the classroom to complete the tests.

The following tests are the only ones that must be completed in the field:

- *Temperature*: Record the air temperature and the water temperature at the site.
- *pH*: Measure the pH at the site. Exposure to air will quickly change pH of subsurface samples.
- *DO*: Fix samples for the Dissolved Oxygen Test. Each group of students will need 20 mL of fixed sample, and each sampling bottle contains 60 mL, so you will need one bottle of fixed sample for every three groups. (You should complete the DO titration within eight hours of fixing the sample.)

If the entire class cannot visit the sampling site, either you or a small group of students could complete these procedures in the field, and the class could complete the rest of the testing in the lab later that day.

6. Obtaining Permission from a Landowner

Check to see if your site is on private property. If it is, explain to the property owners what you would like to do and ask for their permission. Stress the educational purpose of the program, and emphasize that the program has nothing to do with regulation or litigation. Some landowners might like to participate with your class.

7. What Students Should Wear

Students should expect to get wet and dirty in the field, and they should not hold back from participating out of concern for their clothing. Be sure they wear clothes that are appropriate for the weather conditions, and emphasize warmth. Even if it seems warm at school, students should bring jackets, and in cooler weather they should have hats and gloves. If possible, at least one member of each group should have rubber boots so he or she can collect samples without getting his or her feet wet. Ideally, everyone should wear waterproof boots or, if the weather is warm, old sneakers.