



AQUATIC STUDIES REVIEW OUTDOOR LAB TEACHER'S GUIDE

Learning Goal: Learners will review previous key points from fall modules, including water quality, critical habitat, and aquatic plant identification.

Objectives:

- Sample lake water and obtain data on temperature, pH, and dissolved oxygen levels.
- Identify critical habitat designation of selected area and what species it benefits.
- Sample and identify aquatic plants at the field site.

Safety Considerations:

- Students should have already had some canoeing experience with previous activities – review.
- Emergency boat/pontoon in area to monitor students and prevent major mishaps.
- All canoes and students visible to shoreline/emergency boat/pontoon/instructor at all times.
- Life jackets should be worn at all times.

Setup:

- Required equipment is located with Module leaders and includes:
 - labeled buoys for each station
 - Critical Habitat: critical habitat laminated guides and Aquascopes
 - Aquatic Plants: identification books, rakes, and buckets to sample plants
 - Water Quality: dissolved oxygen testing kit, thermometer, pH strips, container to sample water
- During this session, half of the class is involved in the aquatic studies review while half are participating in the food web lab. There is a separate timeline document provided for each of these concurrent sessions to break down their individual timing. Split student canoe pairs into three groups: A, B, C. These groups will be rotating through the three sections of the aquatic studies review (critical habitat, water quality, and aquatic plant identification).
- **High school helpers** - high school helpers should be paired with professionals in a boat at each of the three stations and based on shore to help launch the canoes.
- Timekeeper/director is essential for successfully coordinating the aquatic studies review.
- All volunteers (7 minimum) should be **anchored** at their site locations. In initial setup, select locations that are spaced near each other to reduce travel time and ensure proximity to safety boats.
- Student pairs will **canoe** to each of the stations.
- Logistical orientation should be done in the morning before students arrive.

1. Give students an orientation.

- **Introduce the instructors** who will be guiding students through the aquatic studies review.
- **Go over safety instructions** (reference student safe conduct agreement). Students are directed to keep properly fitting life preservers on at all times.
- **Pictures** – remind students to take pictures at each of the stations.

2. Give logistical directions to students.

- **Student group assignments** – tell students which group they're in and where they start.
- **Rotation directions** – explain how groups will rotate through the three modules.
- **The timekeeper will ring two bells** – a 5-minute warning bell before they need to rotate and a second bell at the start of the next rotation.
- **When the first bell is rung, wrap-up your session** – discuss key concepts (if you have additional time connect your topic to a broader lake ecology context), score, and initial their module's section of the lab packet. Make sure to direct students to the next module site.
- **Remind students that an airhorn will be blown at the end of the session to signify that they should move to the next activity** – after the third rotation, students should either switch to the food web session or take their completed lab books and cameras to the designated table before going to the beach for the canoe race.

3. **Have students depart in their canoes** – high school helpers should assist. The timekeeper should direct students to their assigned aquatic site. Instructors should be prepared and in place at their aquatic module site.

Water Quality

The module leader and a **high school helper** should be stationed with the equipment on a pontoon boat. Students will canoe to the site for testing. The high school helper should stabilize the canoe while students conduct the pH, dissolved oxygen, and temperature testing. Remind students to take pictures to document the testing process and the results.

Critical Habitat

Leaders should have the laminated DNR CH designation sheets and Aquascopes ready for students to use. Module leader and a **high school helper** should be anchored with the equipment at the critical habitat site. They should have students observe the habitat at the site and lead a discussion about what species the critical habitat benefits. As time allows, extend the discussion to include connections to other critical habitats and species role in the food web. Remind students to take pictures of the site, this could include underwater pictures.

Aquatic Plants

Module leader and a **high school helper** should be anchored at a site (predetermined) with aquatic plants. They should have rakes that are suitable to student sampling (students in canoes should use shorter plastic rakes) and buckets in their canoe for the students to use. If possible, an additional aquatic plant expert should be located on shore with a table and identification books. Students should use a rake to collect samples, put them in the bucket, and return to shore to identify. Remind students to take pictures to document the aquatic plants and sampling process.

Post-Aquatic Studies Review

After both sessions of aquatic studies review have been completed, all instructors and volunteers should consult the schedule to see if they are assigned to assist with signing and collecting student lab books or the setup and running of the canoe race. At this time, canoes and **safety boats** should be set up for the canoe relay race.