

Testing the Waters: Assessment of Abiotic Impacts on Ecosystem Health

Objective: Demonstrate your ability to test and analyze water samples to evaluate how chemical factors impact the health and sustainability of freshwater ecosystems.

Question	Rank the water samples from most to least suitable for supporting aquatic life. Justify your rankings based on the water quality parameters tested.
Materials	Water samples from 3–4 sources Test kits or test strips for: • Nitrates (NO_3^-) • Nitrites (NO_2^-) • Ammonia (NH_3/NH_4^+) • Carbonate/Alkalinity (CO_3^{2-}) • Hardness (Calcium & Magnesium) Test tubes or small clear containers Gloves Safety goggles Timer or stopwatch Waste disposal container for used test strips Data recording sheet (handout) Color comparison charts for each test

Procedure:

1. Put on safety goggles and gloves before handling any materials.
2. Label your test tubes or containers for each required water sample (Sample A, B, C, and D).
3. Pour a small, equal amount of each water sample into the labeled containers.
4. Begin with the nitrate test. Dip the nitrate test strip into Sample A or follow kit instructions.
5. Wait the recommended time for the color to develop (usually 30–60 seconds).
6. Compare the test strip color to the chart and record the nitrate result for Sample A.
7. Repeat steps 4–6 for nitrate tests on Samples B, C, and D.
8. Repeat the entire process for nitrite, ammonia, carbonate, and hardness—testing each sample one at a time and recording results in your data table.
9. If time allows, test the optional Sample E (provided by your teacher or chosen by your group) as a challenge. Record and compare its results to the others.
10. Rinse or dispose of test containers properly between tests to avoid contamination.
11. Ensure all test results are complete and clearly recorded for each water sample.
12. Analyze your data to determine which samples fall within healthy ranges for aquatic ecosystems.
13. Rank the water samples (A–D, or A–E if completed) from most to least suitable for supporting aquatic life, and justify your rankings.
14. Complete the analysis questions and CER response using your data to support your reasoning.
15. Clean up your workspace, dispose of used test strips and waste as instructed, and return all lab equipment neatly.