

## CHEMISTRY & WEATHER

**BACKGROUND:** This station samples surface water chemistry to assess water quality, and records details on weather to provide some context for the readings. For each sampling rotation collect a new water sample. **Directions for all tests will be in the kit.**

**CHEMISTRY:** Be sure to clean up after you finish sampling. ALL WASTE WITH REAGENTS IN IT GOES IN THE WASTE CONTAINER – extra sample water can go back in the river.

### SAMPLING INCLUDES:

**DISSOLVED OXYGEN:** The oxygen available in the water for the biology including fish to use. Healthy oxygen for river life is 5-11 ppm. To determine the oxygen available for fish and marine life you will also need to get water temperature and determine percent saturation. Please follow the directions carefully. This test is not difficult but it is fussy - **Common Problems:**

- Air bubbles introduced to the sample
- not fully emptying the reagent packet into the sample
- not swirling the sample when you add the titrating drops

**SALINITY: 2 different methods –**

- **Refractometer** - works on light refracting off the salt in the water
- **Glass hydrometer** – works off the density of the salt. Try and get them to be careful as it is glass ☺
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**PH AND ALKALINITY:** pH measures the acidity or basic quality of the water (7 being neutral) and alkalinity measures the capacity of the water to buffer a preferred amount of 80-100 ppm.

**NITRATES & PHOSPHATES:** Measure the amount of nutrients in the water. We would want these amounts to be trace – no greater than 1.0 ppm.

They can read and follow the directions. The split below allows for 3 groups of 2-3 students sampling. **BE SURE EACH TEST IS COVERED AND RECORDED** completed tests on the **posted sheet** AND in the folder.

Tests that work well together for teams of samplers (READ DOWN COLUMN)

GROUP 1	GROUP 2	GROUP 3
DISSOLVED OXYGEN & WATER TEMPERATURE	NITRATES	PHOSPHATES
ALKALINITY	SALINITY –record method: (glass hydrometer or refractometer,	pH

The **Quality Control** of the chemical tests will occur as we do repetitions throughout the day. If answers vary considerably they should do another run of the test to verify. Have them work with partners to run the tests.

BE SURE WASTE IS Poured INTO MARKED WASTE CONTAINERS. Rinse glassware with distilled water between uses.

Note - Protective gloves are available in the boxes if desired. We don't use anything that has more than dilution as a clean up EXCEPT the cadmium in the nitrates test. Hands can be 'rinsed' in the Hudson to dilute anything that might spill on them.

**Have the students consider what the effects will be from the readings they collect:**

- What is the salinity – how will this effect them?
- What do you think affects your pH- acid rain? Bacteria? Salinity?
- Will the direction of the tide affect any of our readings? And which ones?

**WEATHER:**

**Complete the weather data at this station. Weather has a direct impact on many of our chemical samples.** While waiting for their samples students can collect weather information.

**• Weather, Site Description – metadata station:**

Focus on collecting & recording air temperature, wind & weather for the day and then for the last 2 days. Discuss how your chemistry data is affected by the weather present and past. Emphasize that this data is extremely important to carefully collect to provide context for the other data – everything from chemistry to fish assemblages.

1. If you have time have them look and complete the physical description piece of the form and then ask them to spend 10 minutes sketching the area at the end of the pier with color pencils trying to be as spatially accurate as possible. Include in the sketch the chemistry sampling sites, where tides and currents are collecting data, plankton pump, blockhouse etc.
2. Record weather, wind etc. – discuss the strengths and weaknesses of Beaufort.