Using a pH Meter (Electrical Conductivity Less than 200 mS/cm)
Field Guide

Task
To use a pH meter to measure the pH of your fresh water sample with electrical conductivity values less than 200 mS/cm

What You Need
- ☐ *Hydrosphere Investigation Data Sheet*
- ☐ *Electrical Conductivity Protocol Field Guide*
- ☐ pH meter
- ☐ Electrical conductivity tester
- ☐ Two 100-mL beaker
- ☐ 25 mL of pH 7.0 buffer solution in a jar with a lid - this jar should be labeled “pH 7.0”
- ☐ 25 mL of pH 4.0 buffer solution in a jar with a lid - this jar should be labeled “pH 4.0”
- ☐ 25 mL of pH 10.0 buffer solution in a jar with a lid - this jar should be labeled “pH 10.0”

  Note: Each jar should have an opening large enough to immerse the pH meter
- ☐ Standard solution for electrical conductivity tester
- ☐ Distilled water in wash bottle
- ☐ Clean paper towel or soft tissue
- ☐ Latex gloves
- ☐ Salt crystals* or table salt
- ☐ Tweezers
- ☐ Stirring rod or spoon
- ☐ Thermometer
- ☐ Pen or pencil

In the Field
1. Fill in the top part of your *Hydrosphere Investigation Data Sheet*. In the pH section of the sheet, check the box next to ‘pH meter’.
2. Put on latex gloves.
3. Rinse tweezers in sample water and dry with paper towel.
4. Rinse two beakers or cups with sample water three times.
5. Fill one beaker or cup with about 100 mL of sample water
6. Using the tweezers, place one crystal of salt in the sample water. (If you do not have salt crystals, fill this letter O with table salt and pour that into the sample water).
7. Stir thoroughly with stirring rod or spoon.
8. Measure the electrical conductivity of the treated sample water using the *Electrical Conductivity Protocol*.

* A note regarding salt crystals. Crystal of about 0.5 – 2.0 mm in diameter are much easier to work with than the very finely ground “table salt” used is some countries. In North America, the larger salt crystals are often marketed as “sea salt”.

a. If the electrical conductivity is at least 200 mS/cm, record value on the *Data Sheet*. Go to step 9.

b. If the electrical conductivity is still less than 200 mS/cm, go to step 6 and repeat until you get a value that is at least 200 mS/cm.

9. Remove the cap from the meter that covers the electrode (the glass bulb on the pH meter).
10. Rinse the electrode on the meter and the area around it with distilled water from the rinse bottle. Blot the meter dry with a clean paper towel. **Note:** Do not rub the electrode or touch it with your fingers.
11. Rinse the electrode with distilled water and blot dry again.
12. Calibrate the pH meter according to the manufacturer's directions.
13. Put the electrode part of the pH meter into the treated sample water.
14. Stir once with meter. Do not let the meter touch the bottom or sides of the beaker. Wait for one minute. If the pH meter is still changing numbers, wait another minute.
15. Record the pH value on the *Data Sheet* under *Observer 1*.
16. Repeat steps 3-14 using new water samples. You do NOT need to calibrate the pH meter again. Record conductivity and pH values on *Data Sheet* as *Observer 2* and *Observer 3*.
17. Check to see if each of the three observations is within 0.2 of the average. If all three are within 0.2, record the average on the *Data Sheet*. If all three observations are not within 0.2, repeat the measurements.
18. Calculate the average of the three observations and record on the *Data Sheet*.
19. Rinse the electrode with distilled water and blot dry. Turn off the meter. Put on the cap to protect the electrode.
20. If you cannot get all three measurements within 0.2 of one another, talk to your teacher about possible problems.