Water pH Field Worksheet

W-W-03

Name:_____

Class:_____

Date:_____

1. Site Name: _____ Site Location:_____
2. Take the temperature of the water you're going to sample. Stick the thermometer in the water and wait 2 minutes before recording the reading (in Celsius) on the table on the last page.
3. Collect your samples. You can simply scoop the water into three small individual containers such as beakers or plastic tupperware or use a bucket to grab one large sample. Avoid stirring up the silt at the bottom or putting your fingers in the samples or sample containers.
4. Take your samples to the testing site. You may be performing your tests in the field or your teacher may want your to cover your samples and bring them back to your classroom.
5. Wait until your water is room temperature. If you still have your thermometer, that's 20-30°C.
6. If you haven't done so already, divide your sample into three beaker-sized containers (around 50 or 100 ml)
7. Place the probe end of the electrical conductivity meter in the water, and follow the instructions that came with the meter to determine the electrical conductivity of your sample. Record this on the table on the last page.
8. If your sample is below 200 mS/cm (millisiemens per cm), then proceed to step 9. If it is above 200 mS/cm, skip ahead to step 10.
9. If your sample is below 200 mS/cm, add a tiny pinch of table salt (fill up this O with crystals) to your sample and stir vigorously until the salt dissolves. Retake the electrical conductivity measurement. If it is now above 200, proceed on to step 10. If not, repeat this step until it reaches that threshold.
10. Place the pH paper in the water and follow the instructions that came with the paper to determine the pH. If the color of your sample paper is in between two of the colors on the chart, pick the closest one. If the color looks nothing like anything on the chart, discard that piece of pH paper and try again. Record the pH on the table on the last page.
11. Repeat steps 7-10 on the remaining two samples, and record all pertinent information on the table.
12. Calculate the average electrical conductivity for your samples and record it on the table.
13. Calculate the average pH for your samples and record it on the table.
    a) pH is logarithmic, so taking the average like you would normally won't work. If you feel comfortable, you may convert pH to hydrogen ion concentration using the formula: $[H+] = 10^{-pH}$. For example, a pH of 7 has a hydrogen ion concentration of 10^{-7}. Once you have converted all the pHs, you may average the results normally. Convert the average back to pH using the formula: pH = -log([H+]).
    b) If your teacher allows it, go http://wgr-sw.com/pH/, and enter the pH values you wish to average. This tool will give you both the arithmetic average and the true average. Record the latter on the worksheet.

Name:_____

14. Repeat this process once a month for at least six months. Alternatively, take samples from different sites compare the pHs between them.

15. Did you see any change in the pH over time? Graph the average pH for each month on the graph below. Do you notice any trends? What do you think is the cause of the shape of your data?

Title:_____

pH

Month

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

16. Did rainfall affect pH? Do some research and find out what the average amount of rainfall was at your study site in the month prior to each sampling. Do you notice any trends?

Title:_____

pH

Rainfall

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Name:_____

17. What other factors can affect the pH of water? Which of these were present at your site and could have affected your readings?

18. Were any of your pH readings far from a typical reading? Why would this happen and what did you do to account for it?

19. Do some research to discover what kind of organism flourish in waters with pH values similar to yours.

20. Come up with your own hypothesis about how one of the factors you measured affects another. Perhaps pair pH with electrical conductivity, or maybe electrical conductivity with temperature.

Title:_____

Hypothesis:

_____

_____

_____

_____

Outcome:

_____

_____

_____

_____

_____

_____

W-W-03

Name:_____

Site:_____ Location:_____

Date	Water Temp	Conductivity 1 (mS/cm)	Conductivity 2 (mS/cm)	Conductivity 3 (mS/cm)	Average Conductivity	pH 1	pH 2	pH 3	Average pH	Rainfall