

Activity 3: Follow-up Activities Wetlands and Water Quality

In the 3rd science workshop we examined **WATER QUALITY** variables of water samples from three **wetland habitats**: a Carolina bay (Ellenton Bay), a blackwater stream (Upper Three Runs Creek), and an industrial pond (coal ash pond).

1. Which of the following dependent variables is **NOT** a measure of water quality? (*circle one*)

Dissolved oxygen pH total suspended solids water depth iron concentration

2. **DISSOLVED OXYGEN** is the amount of oxygen in the water. It is essential for aquatic organisms. Warm water holds less oxygen than cool water, and flowing water often holds more oxygen than still water. If the **Carolina bay wetland** is the shallowest of the three habitats and it is still water, the **stream** is deeper flowing water, and the **industrial pond** is deep still water, which habitat would you **PREDICT** to have the lowest dissolved oxygen on a **HOT** summer day?

3. In the table below the variables “hardness” and “pH” are **DEPENDENT** (or **RESPONDING**) variables. Name four other dependent variables we measured. _____

Use the data in the **TABLE** below to answer the questions that follow.
Data from seven 4th grade classes are presented. Work space on back of sheet.

Water Quality Variable	Wetland Habitats		
	Carolina bay (Ellenton Bay)	Stream (Upper Three Runs Creek)	Industrial (Coal Ash Pond)
Dissolved Oxygen (ppm)	8, 8, 8, 8, 8, 8, 8 Average=_____	8, 8, 8, 8, 8, 8, 8 Average=_____	8, 8, 8, 8, 8, 8, 8 Average=_____
Hardness (ppm)	80, 80, 80, 80, 80, 80, 80 Average=_____	40, 40, 40, 40 40, 40, 40 Average=_____	280, 360, 440, 380, 480, 520, 480, 440 Average=_____
pH	6, 6, 6, 6, 6, 6, 6 Average=_____	7, 7.5, 8, 7, 7, 7, 6.5 Average=_____	4, 4, 4, 4, 4, 4, 4 Average=_____
Iron (ppm)	1, 1, 0.5, 0.5, 1, 1, 0.5 Average=_____	0, 0, 0, 0, 0, 0, 0 Average=_____	10, 10, 10, 10 10, 10, 10 Average=_____
Phosphate (ppm)	4, 3, 1.5, 2 3, 2, 2.5 Average=_____	2.5, 2, 2.5, 2, 3, 2, 2 Average=_____	1.5, 2, 3, 2 2, 2, 2 Average=_____
Nitrate (ppm)	20, 10, 5, 10 15, 10, 10 Average=_____	0, 0, 0.5, 0 0, 0.5, 0 Average=_____	0, 0, 0, 0 0, 0, 0 Average=_____

4. Calculate the averages (to the **tenths place**) for each water quality variable in each habitat type in the work space at the bottom of this page. Place your answers in the spaces provided in the table.
5. The Carolina bay water had consistently higher amounts of **nitrates** in the water samples. The bay samples also had numerous mosquito larvae and other **aquatic organisms**. Could there be a connection between high nitrates and numerous organisms?

How are the two variables related?

6. Many aquatic organisms have difficulty surviving in water that is too **acidic**, or has a pH less than four and a half (**4.5**). Of the three habitats we sampled, which has a **pH** that would be least suitable for organisms to live in?
-

7. Which water quality variable showed the least **VARIATION** across all three habitats?
-

8. Which water quality variable showed the greatest **RANGE** across all three habitats?
-

9. Milliliters (abbreviated ml) is a **unit of measure** of (*circle one*):

length volume speed time mass temperature

10. On a separate sheet of paper draw a **BAR GRAPH** to show the **average pH** for the three habitats. Be sure to put it in your science notebook.

Work space to calculate averages