Water Quality Project Report – Introduction and Methods

Field Biology

This report is an individual assignment. It should be written in the PAST TENSE (because you will be completing this report after your project is complete). When you are done, e-mail your work to dan.bregar@corvallis.k12.or.us with the subject line "per *X your name* WQ report".

Introduction:

This section of your report consists of a description of your question and background information about your project. Most of this information should come from your Water Quality Project Proposal.

In one paragraph, explain your "What is the Relationship Between" question. Add some supporting details to clarify the purpose of your study.

In another paragraph, describe the two water quality parameters you included in your question. Explain what each parameter is and why it is important for water quality.

In a third paragraph, describe the second factor in your question. Add supporting information explaining the ecological importance of this factor.

Methods:

This section of your report will contain three step-by-step lists of instructions – one for each water quality parameter in your question and one for the second factor in your question.

Make sure that your instructions are clear, detailed, and describe the actual steps you took to make your measurements.

Here is an example of what these first two sections of your final report should look like:

Water Quality Final Report – Nitrates, Conductivity, and Animal Waste

Introduction:

The question I asked for my study was "What is the relationship between nitrate levels and the conductivity of the Willamette River and the amount of animal waste along the shore of the river?" I was interested in seeing if there was any correlation between the amount of visible animal waste and the amount of nitrates (NO_3^-) and the level of conductivity in the Willamette River. Animal waste is rich in nitrogen, so I thought it might increase the amount of nitrogen in the river. I also thought that the salt compounds in animal waste might increase the conductivity of the river water.

Nitrates are compounds of nitrogen and oxygen that are created by biological organisms. Nitrogen is essential for life and is a component of DNA. Animals produce nitrates in their waste as a byproduct of metabolism. Nitrates are considered a fertilizer and a pollutant – they can help plants and other organisms grow, but in high quantities, nitrates can cause bacterial blooms in water that deprive other organisms of oxygen.

Conductivity is a measurement of how much electrical current water can carry. Conductivity is an indicator of other substances in the water: salts (substances that are created when two charged particles bind together electromagnetically). Different salts can have different effects on water quality. Some salts are beneficial for organisms and plant life, and can have a useful nutritional effect on drinking water. However, in high quantities, most salts render water undrinkable and can cause plants and animals to dehydrate. Some salts are also toxic in and of themselves.

Animal waste consists of urine and feces produced by organisms. Urine is generally not visible; however, feces takes a while to decompose so it can be detected for several hours or days after it is produced. Animal waste consists of water, nitrates and other nitrogen compounds, undigested or partially digested foods, and intestinal bacteria. When animals generate waste near a river or lake, there is potential for some of the waste to be washed into the water during rain storms.

Methods:

Nitrates –

1. We collected a small sample of water near the shore of the Willamette River
2. In the lab, we attached a nitrate sensor to a laptop computer
3. We calibrated the sensor by using known solutions of 0 mg/L nitrogen and 10 mg/L nitrogen
4. After calibrating the sensor, we tested our calibration on 0 mg/L nitrogen and 10 mg/L nitrogen solutions
5. Finally, we tested the nitrate levels in our sample and recorded them on our data sheet

Conductivity –

1. We tested conductivity directly in the Willamette River by using a conductivity sensor
2. The sensor did not need to be calibrated, so we simply placed the electrodes in the water and wrote our results on our data sheet.

Animal Waste –

1. At each spot where we collected data, we looked for 10 meters upstream and 5 meters away from the bank for any visible animal waste
2. Any time we spotted animal waste, we estimated the amount (in grams) and tried to identify what kind of animal it came from

3. We spent five minutes searching each site so we had an equal chance of finding animal waste in each spot