

Who Contaminated the Water?

Acquisition of Learning

1. Hand out data collection sheet to each group of students.
2. Explain that using water quality testing probes, your group needs to gather data about the water samples A, B, and C and see if you can figure out where the water samples came from on the map.
3. Hand out four beakers to each of the groups (label them: A, B, and C and distilled water).
4. Pour the correct sample of water into the beakers with that label.
5. Explain that the first quantity that they are going to measure is pH. What is pH? Simplify by saying that it is *how acidic or basic a solution is- if less than 7 it is acidic, more than 7 is basic, 7 is neutral*.
6. Show the students how to use the pH probeware. Plug probe into LabQuest, rinse the pH probe in distilled water beaker, then dip pH probe into *Sample A*. Record the number on the data sheet.
7. Rinse the probe in distilled water beaker and repeat process for B and C.
8. Replace pH probe and bring out conductivity probe. What does conductivity mean? It *measures the ability to conduct heat or electricity*. Explain that this probe measures the presence of ions, including salt Na⁺, Cl⁻.
9. Insert probe into LabQuest. Rinse probe with distilled water. Place probe into *Sample A*, swirl probe and record data.
10. Rinse probe with distilled water and repeat steps for *Samples B and C*.
11. Remove Turbidity probe. What does turbidity measure? The degree to which the water loses its transparency due to the presence of suspended particulates – Simplified: *How clear is the water*.
12. Carefully take out clear vial. Stir *Sample A* and fill vial with water (the meniscus should be at the top of the line).
13. Holding the vial by the lid, wipe sides of vial with lint-free cloth. **Make sure the vial is dry before putting into sensor!**
14. Holding the vial by the lid, line up arrows and place vial into sensor. Record reading after 3 seconds. (this reading will change as materials settle).
15. Rinse vial with distilled water and repeat procedure for *Samples B and C*.
16. Rinse vial with distilled water and replace sensor in box.

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Data Analysis

1. Have student groups record their data on the board at the front of the class. Look for any possible outliers. If you find outliers discuss the importance of taking three trials.
2. These represent multiple trials. Have students take the median of the class data and record this number on their data sheet.

Closure

1. Once the medians are found, have students conclude where they think each water sample came from (*A from location # 1; B from location #2; C from location #3*).
 2. Explain how they came to this conclusion. (*Discuss point and nonpoint pollution, and importance of keeping accurate records during data collection*)
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Student Name: _____

Parameters	Sample A Group	Sample A Class Median	Sample B Group	Sample B Class Median	Sample C Group	Sample C Class Median
pH						
Conductivity						
Turbidity						

Based on the data your class collected from the water samples. From where on the watershed map do you think each sample was collected? Write the correct number for each sample.

Sample A = Number ____

Sample B = Number ____

Sample C = Number ____

Explain how your team came to these conclusions: _____

<u>Parameters</u>	<u>pH</u>			<u>Conductivity</u>			<u>Turbidity</u>		
<u>Sample</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>
<u>Group 1</u>									
<u>Group 2</u>									
<u>Group 3</u>									
<u>Group 4</u>									
<u>Group 5</u>									
<u>Group 6</u>									