Name: _____ Date: _____ Class: _____

Should I Drink That? Worksheet

Pre-Lab Prediction

As you know, electrical conductivity is the ability of a material to conduct electricity.

In this lab, you have **4 liquid samples**: deionized water, purified water, tap water, and salt-water solution.

Question: *Which water test sample do you think will have the highest conductivity? Explain your logic.*

Part 1. Measuring Electrical Conductivity of Different Liquids

Data Collection

Test the electrical conductivity of the water samples using different pieces of equipment:
LED-conductivity tester, electrical conductivity tester and digital multimeter.
Refer to the **Lab Equipment Testing Instructions** for the steps to follow to use this equipment.

Table A. Fill in the table with your conductivity measurements of the water test samples.

Water Sample	Relative LED Brightness (observation)	Electrical Conductivity (µS/cm)	Resistance (ohm, Ω)
deionized			
purified			
tap			
salt-water			

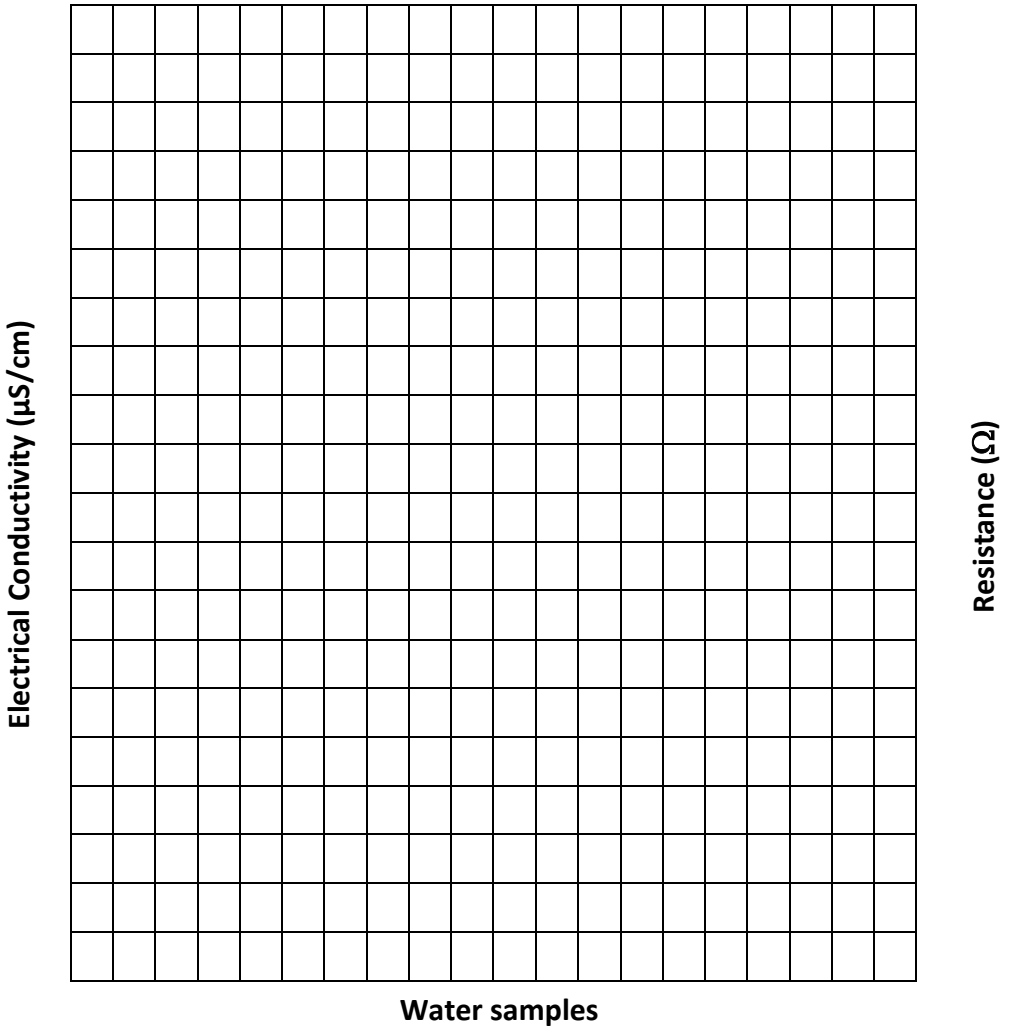
Data Analysis

1. Compare the brightness of the LED that you observed using the LED-conductivity tester in each sample. Describe the relationship of the brightness of LED with the conductivity of a sample.

2. Do each of the samples have the same EC reading? Explain your observations.

3. In graph form, show the relationship between resistance and electrical conductivity. Label all graph components and provide a graph title.

Title: _____



4. What is the relationship between the electrical conductivity and the resistance of water? Explain your answer.

5. Was your pre-lab prediction correct? Explain your answer.

Name: _____ Date: _____ Class: _____

Part 2. Electrical Conductivity of Community Tap Water Samples

1. Looking at the school district map, group yourselves according to the area where your home is located. **My home is located in group _____.**
2. **Prediction:** Do you think the water in your area will have the same electrical conductivity as the other group areas? Explain your logic.

3. Pour your home tap water sample in a clean lab container (such as a paper cup).
4. Measure the electrical conductivity of your sample using the electrical conductivity tester, as you did in Part 1. **The electrical conductivity of my home tap water sample is _____** (µS/cm).
5. Record your home tap water measurement in the class table.
6. Describe your area. *Does it have schools, hospitals, restaurants, grocery stores, offices, shops, factories, rivers, ponds, parks, hills, farms, highways, roads, train tracks, bridges, etc.?*

7. As a group, agree on a summary area description and have one person write that on the class data table for your group area.
8. When everyone is finished, calculate the average conductance per group. Write this in Table A and in the class table for your group area.
9. Fill in Table B with the group area information and data from the class table.
10. Rank the groups in order of increasing conductance.

Table B. Average electrical conductivity at different areas in the school district.

Area Group #	Area Description	Average Conductivity (µS/cm)	Ranking (lowest = 1)
1			
2			
3			
4			
5			

Data Analysis & Reflection

Analyze the class table results by writing a paragraph that includes the answers to these questions:

1. What reasons might explain a high electrical conductivity for tap water?
2. What are any differences in the conductivity readings among groups?
3. Based on the results, what relationship exists between the type of area and the electrical conductivity of tap water?
4. Thinking as an environmental engineer, what are ways to reduce the conductivity of tap water? Propose any design (or design improvement).