

FOR EACH PROBLEM, CLEARLY INDICATE THE ANSWER AS WELL AS THE CALCULATIONS WHICH GENERATE THE ANSWER. YOU MAY ATTACH ADDITIONAL PAGE(S) IF NECESSARY, BUT **THE ANSWER MUST BE ON THIS SHEET**. PLEASE READ THE TEXT AND TABLES CAREFULLY. LIKE OTHER TAKE-HOME ITEMS, THIS IS NOT TO BE WORKED ON TOGETHER IN LAB! TURN THIS IN AT THE START OF LAB NEXT WEEK. YOU CAN SUBMIT THIS PROBLEM SET IN THE **102 DROP BOX** – THE FIRST TOP LOCKER JUST OUTSIDE THE FRONT LAB DOOR.

1. You added **10 ml** of a lake water sample to **90 ml** of sterile diluent; this is the “first dilution” indicated in the table below.

After mixing thoroughly, **1 ml** of this dilution was added to **9 ml** of sterile diluent to make the second dilution. To make the third dilution, **0.1 ml** of the second dilution was added to **9.9 ml** of sterile diluent. From **each** of these three dilutions, 10 ml, 1 ml or 0.1 ml amounts were inoculated into **duplicate** pour-plates of Plate Count Agar (PCA) as shown in the table below.

After appropriate incubation, colonies were counted. (TNTC = too numerous to count.)

dilution of lake water	first dilution		second dilution		third dilution	
	10 ml	1 ml	1 ml	0.1 ml	1 ml	0.1 ml
Amount inoculated into each of duplicate plates of PCA:						
For convenience, you can indicate the “plated dilution” or “dilution factor” here:						
Colony count on PCA plates:	TNTC	TNTC	212, 208	23, 15	4, 2	0, 0

- a. (3 points) What was the “**total aerobic plate count**” (in **CFUs per ml**) of the original, **undiluted** sample of water? (Be sure you indicate just one answer rather than a separate answer for each plate counted.)
- b. (1 point) Ten ml of the first dilution is equivalent to _____ ml of the original, undiluted sample of water.
2. (1 point) **Ten ml** of spring water were added to a petri dish to which 20 ml of melted Plate Count Agar were added. After incubation, 250 colonies arose on the plate. What was the count of CFUs **per one ml** of the spring water?

3. (3 points) One ml of sauerkraut juice was pipetted into a 99 ml dilution blank. One-tenth ml of this dilution was pipetted into a 9.9 ml dilution blank. From this dilution, one-tenth ml was inoculated into a sterile petri dish to which an appropriate amount of an all-purpose agar medium was added. After incubation, 240 colonies were counted. How many colony-forming units (CFUs) were present **per ml** of the sauerkraut sample?
4. (2 points) The **same dilution** can be obtained for **all** of the following situations:
- The addition of 1 ml of a sample to 9 ml of sterile diluent.
 - The addition of _____ ml of the same sample to 18 ml of diluent.
 - The addition of 11 ml of the same sample to _____ ml of diluent.