Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Using a Mini-Ecosystem to Study Pollution

**Purpose**

The purpose of this lab is to evaluate pollution in a mini-ecosystem by using pond water samples and selected pollutants. [[1]](#endnote-1)

**Procedure**

 **Materials**

1. Pond water (several liters)
	1. Surface water (include duckweed and the organisms that may reside in it)
	2. Water from varying depths
	3. Water from the space just above the bottom detritus
	4. Bottom detritus (3-4 cups)
	5. \*Do not include any macroscopic animals like fish or frogs.
2. Containers (2 Liter)

**Sequence of Steps**

1. Divide the water and its contents as equally as you can among several containers.
2. Select one container and label it as the control.
3. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Duplicate in this container as many of the features of the natural pond as you can. For example, it should not be aerated. The light quality and intensity should correspond to the average light conditions in the natural setting.
4. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Examine the life in this control every few days. Record observations of the species present and the relative sizes of the populations of various organisms.
5. For each of the remaining containers of pond water, change one environmental factor, as listed below. Monitor the effects that this change has on the life in the water.
	1. Change in light intensity
	2. Change in dissolved oxygen concentration (achieved by aerating the water with a pump)
	3. Increase in the concentration of a plant nutrient such as phosphorus or nitrogen
	4. Addition of lawn fertilizer
	5. Addition of various types of detergents
	6. Increase in average temperature
	7. Addition of organic matter
6. In some cases no obvious changes will occur for several weeks or even for several months. This is a long term experiment. Try to predict in advance the effects of the changes that you impose on the environment.

**![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()**

 **Observations**

1. Describe below the treatment you selected for each water sample. (Ex. Added 1 tbs of lawn fertilizer). Hypothesize the effect you believe this treatment will have on the mini-ecosystem.
* Control

Hypothesis:

* Treatment Group 1

Hypothesis:

* Treatment Group 2

Hypothesis:

* Treatment Group 3

Hypothesis:

* Treatment Group 4

Hypothesis:

2. Record your observations in Table 1.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Control | Treatment 1 | Treatment 2 | Treatment 3 | Treatment 4 |
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3. Describe the observations you noted using complete sentences.

4. Based on this information, do you accept or reject each of your hypotheses?

5. Agricultural application: Managing water quality efficiently is an important job of agriculturists. Whether water is used for animals or plants, agriculturists work hard to ensure that they do not pollute their natural water source. Below, brainstorm ways that agriculturists work to make sure water is not polluted.

1. (2008).Using a Mini-Ecosystem to Study Pollution. *Prentice Hall, Inc.* [↑](#endnote-ref-1)