

Name \_\_\_\_\_ Date \_\_\_\_\_

### Inquiry Oxygen

During this lab, you will design and carry out an experiment that investigates how dissolved oxygen changes in response to a variable you select. This will be done in 'microcosms', or models of a real aquatic ecosystem.

#### Step 1: Select your variable

- \_\_\_ Temperature
- \_\_\_ Aquatic plants: how many? \_\_\_\_\_ what kind? \_\_\_\_\_
- \_\_\_ Aquatic animals: how many? \_\_\_\_\_ what kind? \_\_\_\_\_
- \_\_\_ Salinity
- \_\_\_ Aeration
- \_\_\_ Decomposition

#### Step 2 : Research

Read the "Dissolved Oxygen" student reading, and answer the accompanying questions.

#### Step 3: Your Design

Now that you have an understanding of the role of dissolved oxygen in an aquatic ecosystem, you will design an experiment to test your variable. Be sure that your experimental design allows you to collect data which will eventually help you SUPPORT or REFUTE your hypothesis!

What is your Independent Variable? (Ex: what are you changing?)

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What is your Dependent Variable? (Ex: what will change as a result?)

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Hypothesis

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Which method will you use to determine whether or not the dependent variable is changing? (Ex. test kit)

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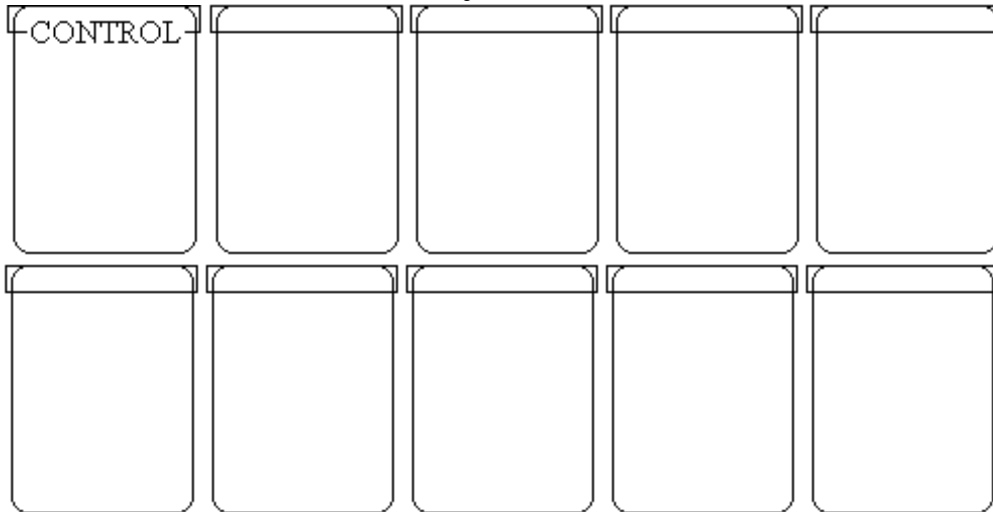
How often will you test whether or not the dependent variable is changing? (Ex. hourly, weekly) \_\_\_\_\_

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How long will you run your experiment? \_\_\_\_\_

Check your experimental process with your teacher before setting it up.

What will you add to each jar? You may use as many (or few) jars as you want. Also, be sure to set up a control! Use the jars below to diagram the set up for your experiment. Write what will be included in each jar.



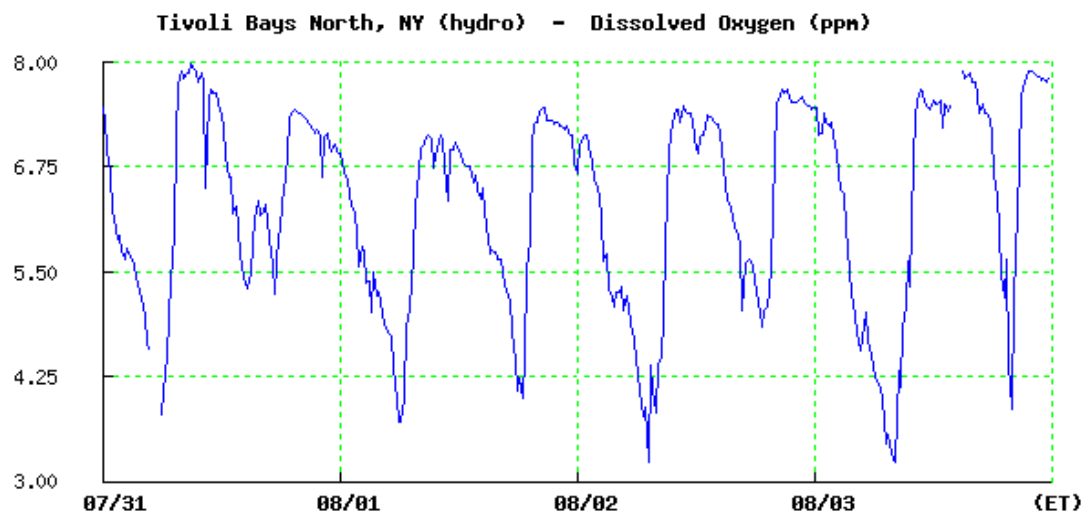
#### Part 4: Data collection

Create a data table to collect your results.

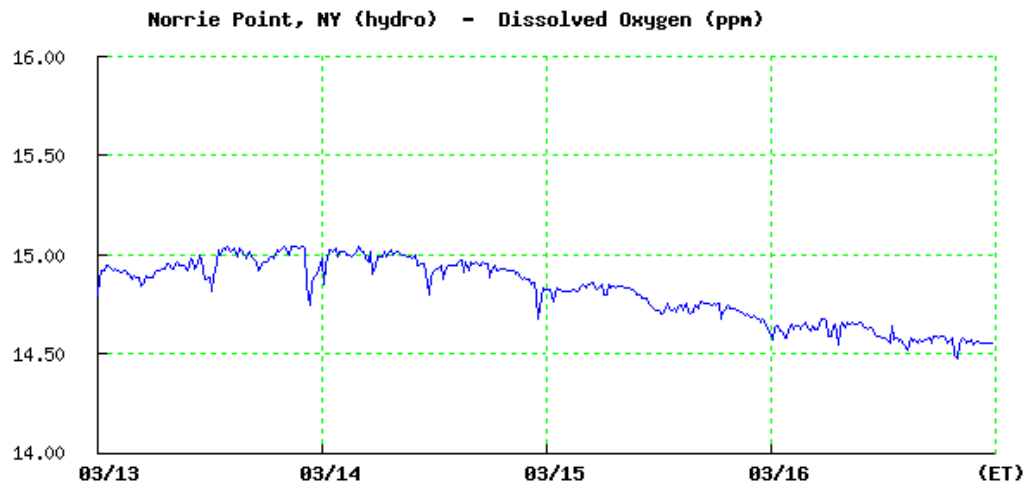
#### Part 5: Analyze results

Share your data with your classmates. In your final lab report, include answers to the following questions:

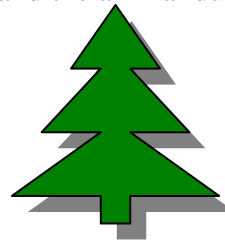
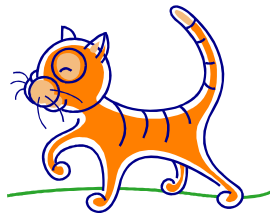
1. What happened to your ecosystem when you changed your variable?
2. What would be the implications of changing your variable for a larger system like the Hudson River?
3. Look at the data from the Hudson River, and answer the questions that follow.



- a. The data above is from the summer of 2009, collected at Tivoli Bay in the Hudson River. What could cause the dissolved oxygen levels go up and down every day?



- b. The data above is from Norrie Point, in the Hudson River, in March of 2009. Why is the dissolved oxygen higher in the winter, when compared to the first graph which showed DO in the summer? Why do you think there is less of a daily variation in DO in the winter?
  - c. Based on the two graphs above *only*, does the Hudson River ever become anoxic? Where and when would you want to sample in order to be sure of your answer?
4. Based on the results of your experiment and that of your classmates', which treatment had the greatest impact on your ecosystem?
  5. a. Using the diagram below, draw arrows to show the relationship between carbon dioxide and oxygen between the plant and the animal during the day.



- b. Does this relationship change at night? Why?
6. Imagine you are managing a local watershed. You need to insure that the reservoir within your watershed remains viable as a drinking water source. What measures would you take throughout the watershed to maintain this level of water quality?