

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

## How does pH affect algae growth?

Use what you remember from the chemistry unit, water quality unit, and cell study to answer the following questions:

1. What pH range represents an acid? \_\_\_\_\_

2. What pH range represents a base? \_\_\_\_\_

3. What pH represents neutral? \_\_\_\_\_

4. What is the pH of pure water? \_\_\_\_\_

5. What is the pH range of lake water? \_\_\_\_\_

6. What happens to living things when the pH is dramatically changed in water? \_\_\_\_\_  
\_\_\_\_\_

7. What pH levels do you want to test? What substances can you use to get the desired pH levels? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. We are going to be using green algae. Green algae are obviously green in color. What do you know about green algae cells? \_\_\_\_\_  
\_\_\_\_\_

9. Green algae are also unicellular. What kingdom do you think they are classified under? Why? \_\_\_\_\_  
\_\_\_\_\_

### Experiment:

You are going to design and perform an experiment to test the effect of pH on the growth of algae. You will use the experimental design graphic organizer to plan the experiment with your group. You will have 5 days to complete the experiment which includes set up and clean up. Expect to have approximately 30 minutes each day to collect data.

### Data collection in the experiment:

You will be collecting data in your experiment by counting cells. It is very difficult to count every cell, so instead you will be taking samples and finding an average number of cells in a small sample. This way you can allow your algae to continue growing for several days and still collect data.

- You will be given a small piece of plastic with a grid printed on it. You should place this grid on a slide.
- Next, you will place ONE drop of your sample on the grid. Place a cover-slip on the slide and put the slide on the microscope.
- When you look through the microscope you should see the squares of the grid as well as the algae cells. You should choose ONE square and count the number of cells in the square.
- Record this number. You should do this for five different squares. Use the counting guide to determine which squares and keep track of your numbers.
- Average these five numbers to get the average number of cells per square.
- Wash the slide, grid, and cover-slip before taking your next sample.

- Be sure you are keeping good record of your counts and averages. This is the data you will use to compare the effect of pH on the algae's ability to grow.

**Experiment Requirements:** (See rubric)

- ✓ Completed Experimental Design Graphic Organizer
- ✓ Detailed procedures for the experiment
- ✓ Daily monitoring of the pH levels and a good control for the experiment
- ✓ Daily data collection (4 days of collection) using cell counting method
- ✓ Data table to organize data
- ✓ A line graph comparing the daily algae counts for each pH level
- ✓ A poster displaying your group's experimental design, data, results, and conclusion

<b>Experiment Rubric</b>	Possible Points	Score
<b>Experimental Design:</b> Defined appropriate purpose, hypothesis, independent variable, dependent variable, control, and constants.	20	
<b>Procedures:</b> Well explained procedures with specific directions on creating various pH levels.	10	
<b>Data:</b> Data is clearly and neatly organized and displayed.	20	
<b>Graph:</b> Data is correctly and neatly graphed to show relationships between the variables.	20	
<b>Conclusion/Summary:</b> Summary of results is provided. Conclusion is stated and supported with data. Students include the "What is next?" step.	20	
<b>Overall:</b> Poster is neat and well organized. All group members were involved and can explain the poster.	10	
<b>Total:</b>	100	