



science

mobile inquiry technology

home

activities

help

ACTIVITY CONTENTS:

Monitoring a Pond

- [Introduction](#)
- [Thinking About the Question](#)
- [Materials](#)
- [Safety](#)
- [Investigation I: Conducting a site assessment](#)
- [Investigation II: Testing samples Day one](#)
- [Investigation III: Testing samples Day two](#)
- [Technical Hints](#)
- [Analysis](#)
- [Further Investigations](#)

◀ back

activity contents

next ▶



science

mobile inquiry technology

home

activities

help

Monitoring a Pond Introduction

Discovery Question: How healthy is my local pond?



This activity enables you to relate different factors in your pond to determine if your pond is healthy.

◀ back

activity contents

next ▶



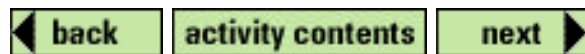
Thinking About the Question

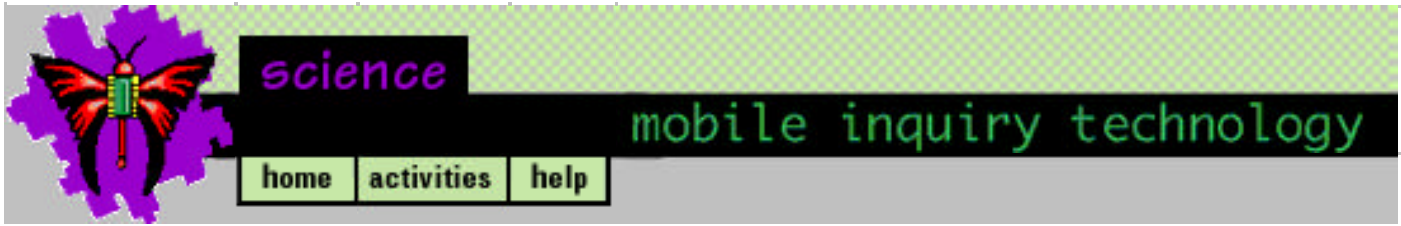
How healthy is my local pond?

Many different environmental factors work together in your pond to promote photosynthesis. Plants are unique among living things because they make their own food. Through the process of photosynthesis which uses light, water, and carbon dioxide plant and tree leaves make sugars that are important for growth.

Discuss with your partner(s) factors, relationships and interactions you have observed among environmental factors around your pond. Draw and label a concept map (linked drawing) of these interactions.

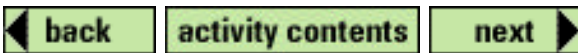
You will be performing a preliminary site assessment of your pond and later test for all of the factors that you have identified as being important to the health of your pond on two different days.

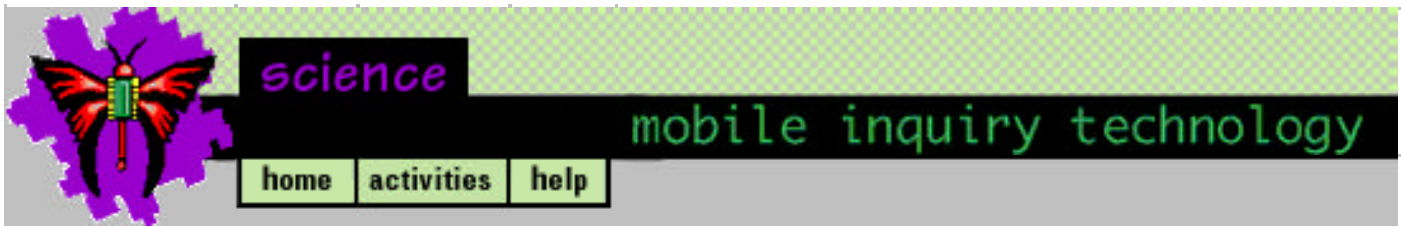




Monitoring a Pond Materials

- light probe
- pH probe
- dissolved oxygen (DO) probe (optional)
- tent stakes (or sticks) and marking tape
- meter stick
- plastic gloves (if DO probe is used)
- topographical map of pond area (optional)

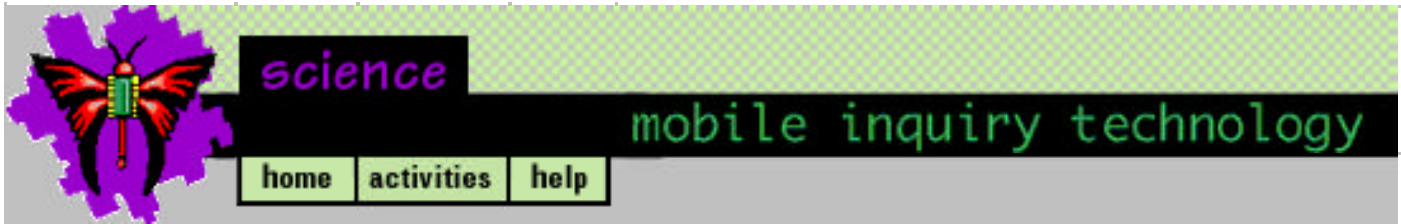




Monitoring a Pond Safety

Investigating natural environments requires respect and attention to the existing ecosystem. Be careful not to alter or damage the stream or river. Select a testing site that is easily accessible and safe for inspection. Wear plastic gloves while working with DO calibration chemicals. Dispose of all chemicals properly.

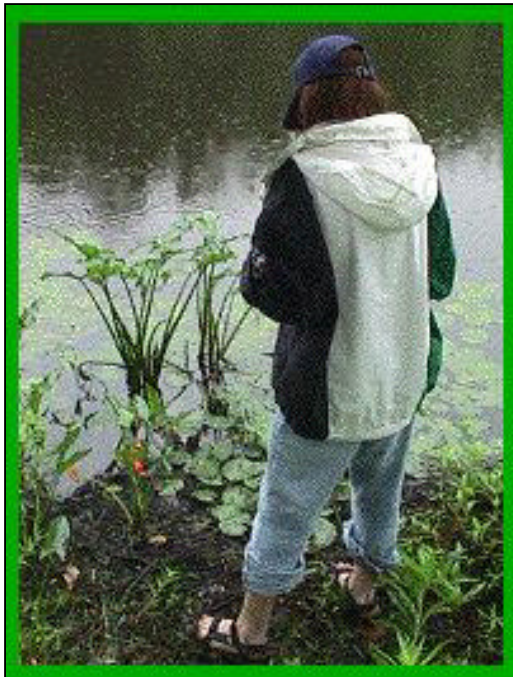




Monitoring a Pond Investigation I

Conducting a site assessment

1. Select the area you would like to test on your pond and spend some time observing and listening to the surroundings. Locate an area that you can place a third of a meter square. Use tent stakes and tape to mark your site.



2. Review the questions in a typical [site assessment](#). Answer as many of the questions about the general characteristics of the site on paper. Remember, that each day that you test, a separate site assessment should be made to reflect the date and weather conditions on the day that you are testing.



3. Sketch your site on paper. Include any features that you think affect the health of your pond.
4. Answer Question 1 in "Analysis".

[◀ back](#) [activity contents](#) [next ▶](#)



science

mobile inquiry technology

home

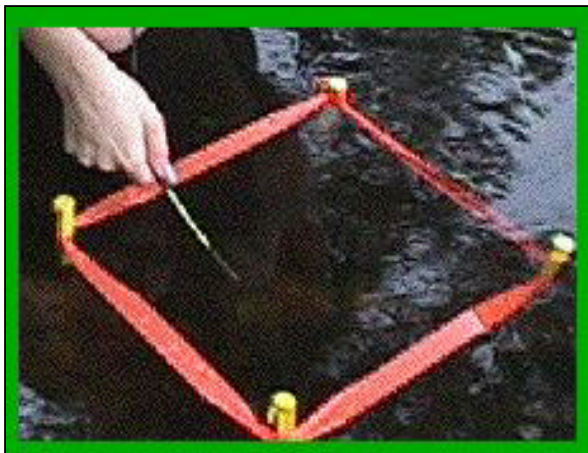
activities

help

Monitoring a Pond Investigation II

Testing samples Day one

1. Test the light, pH, and DO (optional) level. Take the readings for only 1 minute. Refer to [Technical Hints](#) to see how to use DataLogger software to record light, pH, and DO (optional).

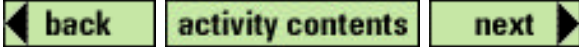


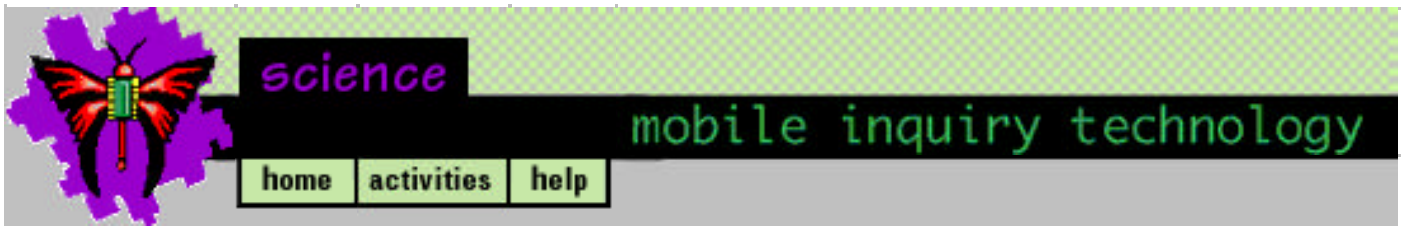
2. Compare your results with other groups by looking at Data Table A on the software. Refer to [Technical Hints](#) to see how to view the data inside the DataLogger software. Make sure to save your data by date and time. Refer to [Technical Hints](#) to see how to save the data.
3. Record any additional observations and weather updates in your site assessment on the computer.





4. Answer Questions 2, 3, 4, and 5 in "Analysis".





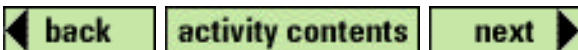
Monitoring a Pond Investigation III

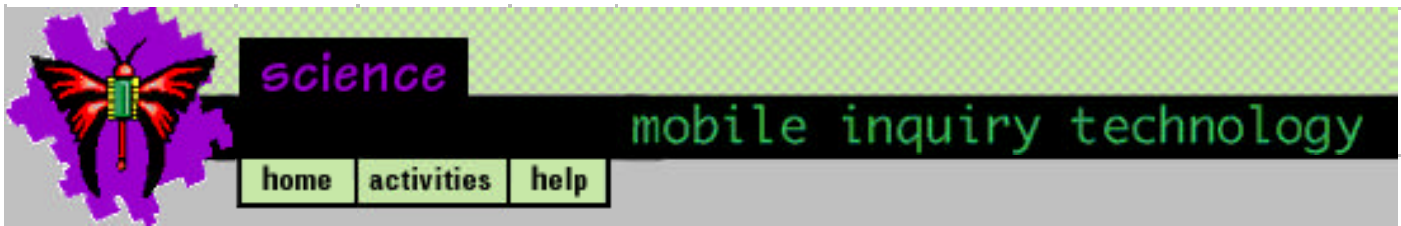
Testing samples Day two

1. Test the light, pH, and DO (optional) level around the same time of day as you did for your first test. Take the readings for only 1 minute. Refer to [Technical Hints](#) to see how to use DataLogger software to record light, pH, and DO (optional).



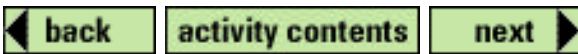
2. Compare your results with other groups by looking at Data Table A on the software. Refer to [Technical Hints](#) to see how to view the data inside the DataLogger software. Make sure to save your data by date and time. Refer to [Technical Hints](#) to see how to save the data.
3. Record any additional observations and weather updates in your site assessment.
4. Answer Questions 6, 7, 8, 9, and 10 in "Analysis".





Monitoring a Pond Technical Hints

- [Creating a spreadsheet](#)
- [Using DataLogger software to record data](#)
- [Viewing and saving the data inside the DataLogger software](#)
- [Transferring your data to your spreadsheet](#)
- [Creating a x-y line graph](#)





mobile inquiry technology

Monitoring a Pond Technical Hints

To create a spreadsheet:

1. Open the ClarisWorks spreadsheet program by selecting it from the opening menu.
2. Title the first column as Time of Day in Cell A1. Title the second column for Light (Lux) in Cell B1. Since you will need to graph each one separately, move to Cell A5 to repeat Time of Day. Type pH in Cell B5. Repeat the procedure for DO in Row 9.

	A	B	C	D	E	F	G	H	I
1	Time of Day	Light (lux)							
2									
3									
4									
5	Time of Day	pH							
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									

CLOSE

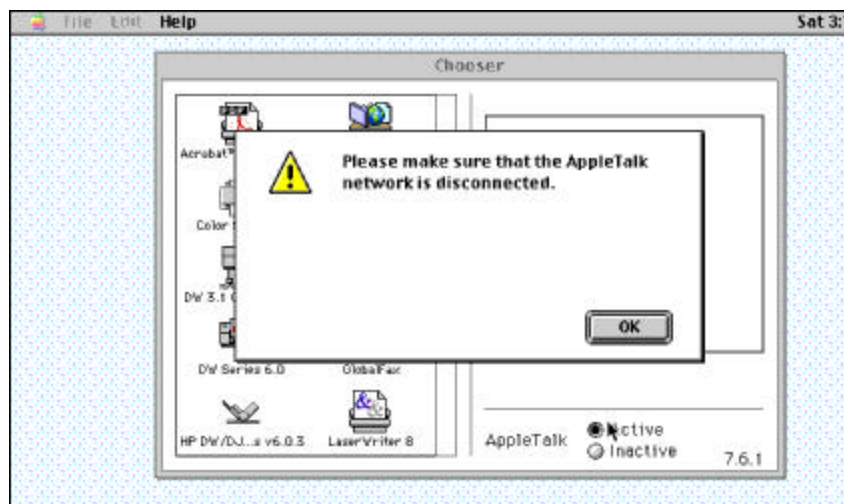


mobile inquiry technology

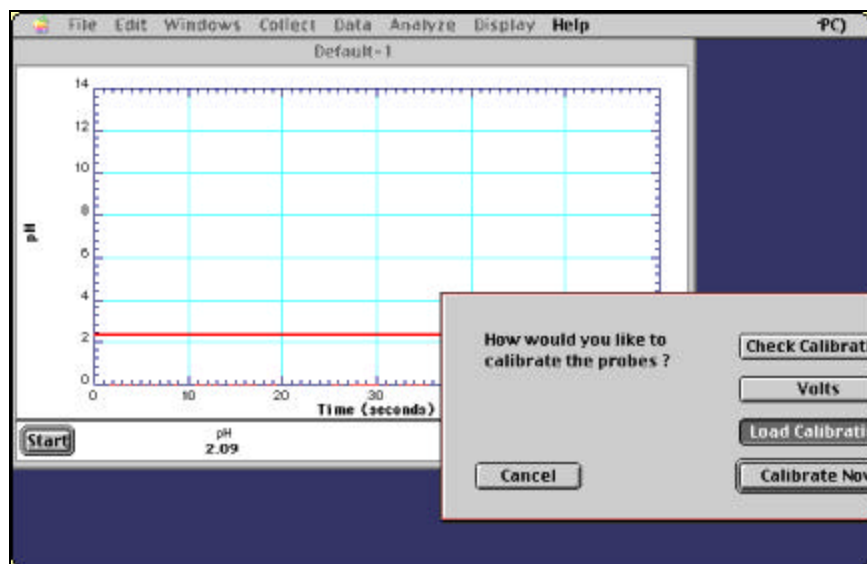
Monitoring a Pond Technical Hints

To use DataLogger software to record data:

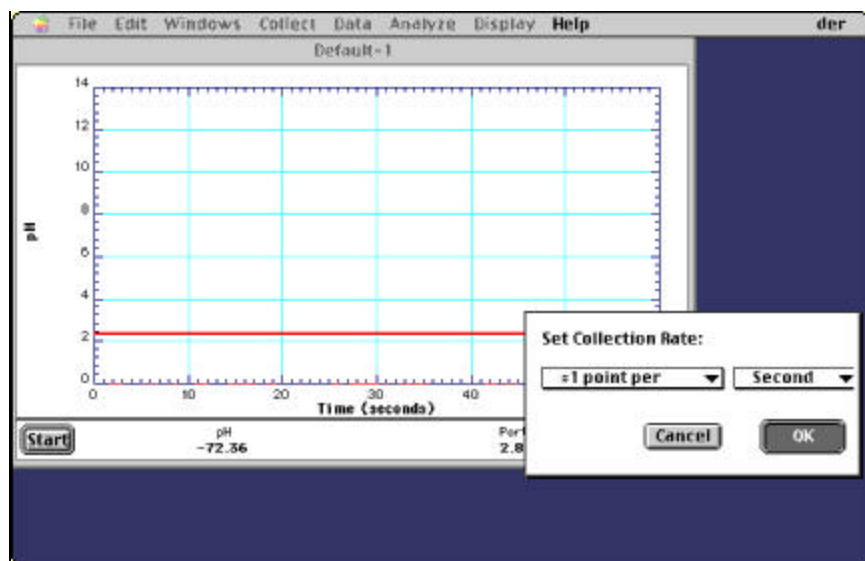
1. Open the Chooser from under the Apple menu. Make sure AppleTalk is inactive.



2. Attach the probe to port 1 of the interface box. Connect the serial port at the back of the computer to the modem/printer port.
3. Double click on the DataLogger software. It will automatically open. From the Collect menu choose Calibrate for the probe. Select Load Calibration for Just Port #1 from Experiment Files.



4. Select the Collect menu and choose Data Rate. For this activity select 1 points per second.
5. From the Display menu select One Graph. Also from the Display menu choose Set All Min, Max. For this experiment, select 0-60 for seconds. Click OK. Select 0-600 for light or 0-14 for pH or 0-15 for DO. Click OK.



6. Click on Start to begin collection.

CLOSE

Copyright © 1999 [Hudson Public Schools](#) and The Concord Consortium, All rights reserved.

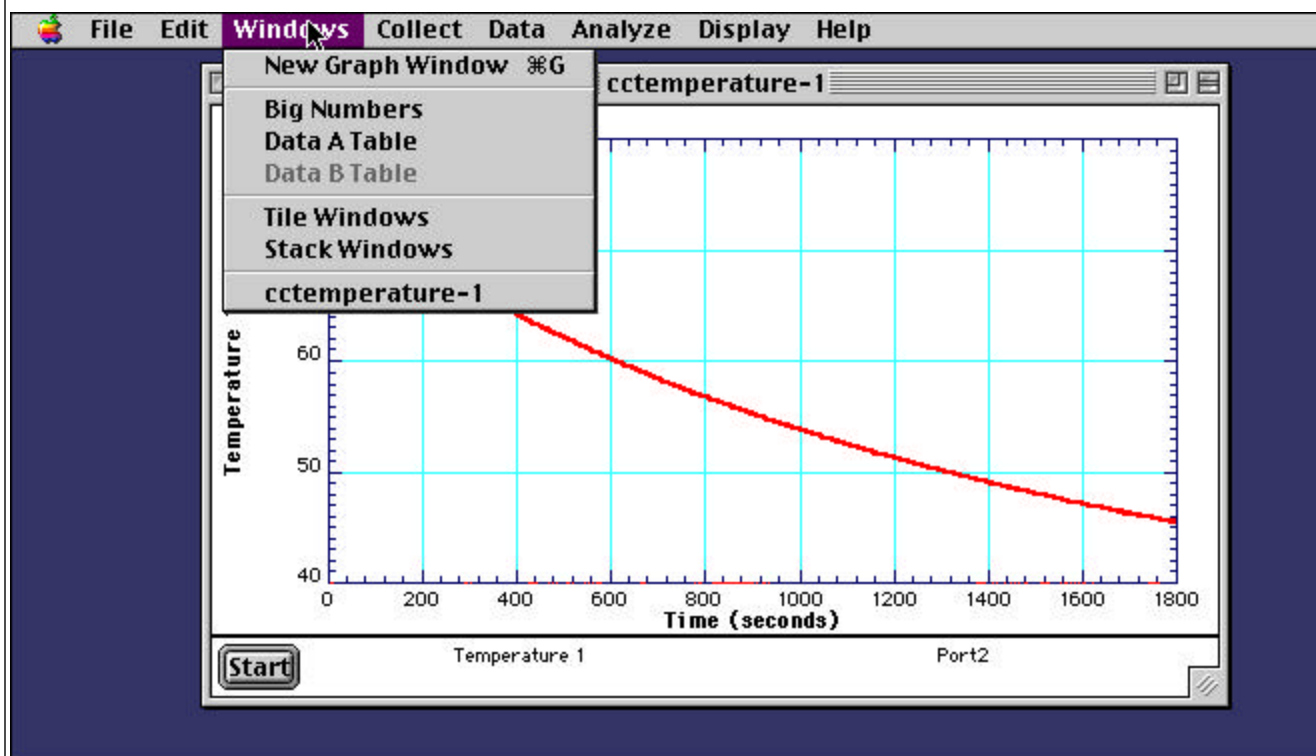


mobile inquiry technology

Monitoring a Pond Technical Hints

To view and save the data inside the DataLogger software:

1. To view data, select the Data A Table from the Windows menu. The data will be automatically highlighted. Select Copy Data from the Edit menu.
2. Select Save As from the File menu. Select the location that you want to save the data. Name the data. You will also be prompted save the calibration.



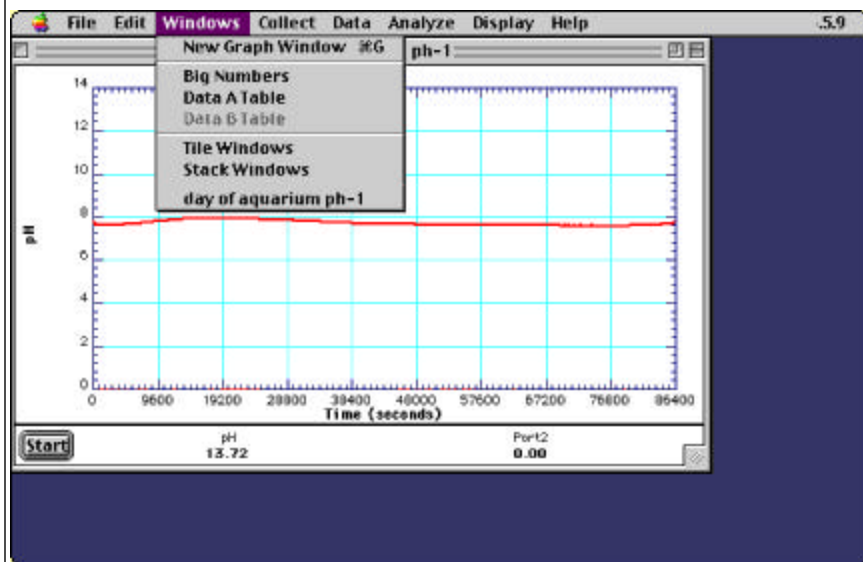


mobile inquiry technology

Monitoring a Pond Technical Hints

To transfer your data to your spreadsheet:

1. To transfer your data to your spreadsheet:
2. Highlight the column that you wish to transfer in Data A Table under the Windows menu. Choose Copy Table from the Edit menu. Open your spreadsheet and select the appropriate column for your data. Choose Paste or Copy Table from the Edit menu.



CLOSE



mobile inquiry technology

Monitoring a Pond Technical Hints

To create a x-y line graph:

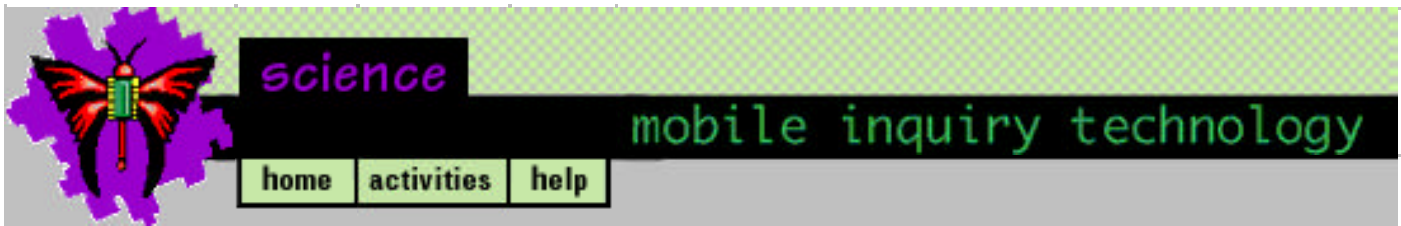
1. Each set of probe data should be graphed separately since the scale between light and pH (and DO) are so different.
2. Highlight the first two columns. Select Make Chart from the Options menu. Select the x-y Line graph.
3. To title the graph, double click on the graph. Select Labels and type High and Low Temperatures. Select from the same menu a horizontal legend.
4. To change the markers to dots, select Series and click on the dots.

The screenshot shows a software window titled 'Final pond (SS)' with a menu bar (File, Edit, View, Help) and a data table. The table has columns A through I. Rows 1-3 are highlighted in yellow. Row 1: A1, B1 (Time of Day, Light (lux)). Row 2: A2, B2 (11:02, 420.24). Row 3: A3, B3 (11:08, 411.73). Rows 4-8 show Time of Day and pH data. Rows 9-11 show Time of Day and DO (mg/L) data. A 'Chart Options' dialog box is open, showing a 'Modify' panel with buttons for Gallery, Axes, Series, Labels, and General. The 'Gallery' panel shows various chart types: Bar, Area, Line, Scatter, Pie, Pictogram, Stacked Bar, Stacked Area, X-Y Line, X-Y Scatter, Hi-Low, and Stacked Pictogram. The 'X-Y Line' chart is selected. The 'Color' checkbox is checked, and the 'Shadow' and 'Square grid' checkboxes are unchecked.

	A	B	C	D	E	F	G	H	I
1	Time of Day	Light (lux)							
2	11:02	420.24							
3	11:08	411.73							
4									
5	Time of Day	pH							
6	11:10	7.67							
7	11:19	7.97							
8									
9	Time of Day	DO (mg/L)							
10	11:20	7.18							
11	11:23	7.2							
12									
13									
14									
15									
16									
17									
18									

5. You can resize the graph by clicking on the corner of the graph and dragging to the size that you would like.

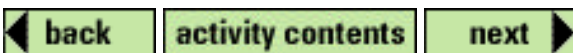
[CLOSE](#)

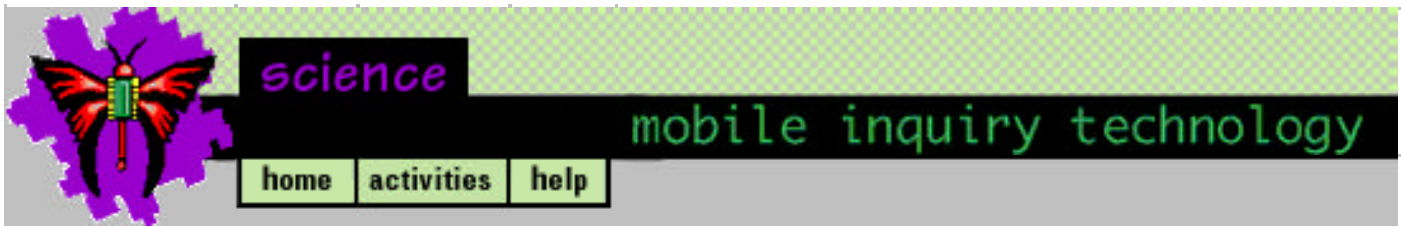


Monitoring a Pond Analysis

Answer the following questions on paper:

1. Did you observe anything unique or unusual about the pond environment?
2. Create a spreadsheet that includes data for Day One and Day Two. Refer to [Technical Hints](#) to see how to use a spreadsheet.
3. Transfer the probe data to the spreadsheet. Refer to [Technical Hints](#) to see transfer data to your spreadsheet.
4. Create an x-y line graph of your data for each probe. Refer to [Technical Hints](#) to see make an x-y line graph.
5. After observing your graph, are the readings for light, pH, and DO (optional) within a reasonable range? Use information from past activities to explain your reasoning. Why was it important to take the readings around the same time of day?
6. Create a spreadsheet for Day Two. Refer to [Technical Hints](#) to see how to use a spreadsheet.
7. Transfer the probe data to the spreadsheet. Refer to [Technical Hints](#) to see transfer data to your spreadsheet.
8. Create an x-y line graph of your data for each probe. Refer to [Technical Hints](#) to see make an x-y line graph.
9. After observing and comparing the graphs from both days, did the readings for light, pH, and DO (optional) change from Day One? If they did, can you explain why?
10. Is there any relationship between the light level and the pH or DO? Describe your reasoning.
11. Write a paragraph about the health of your pond. Use any evidence that you collected during your monitoring of the pond.





Monitoring a Pond Further Investigation

- Determine how the temperature, light, and pH are related during a 24-hour period. How are these factors related?
- Design an experiment to investigate the light, pH, temperature, and dissolved oxygen for a week-long period. Did environmental factors, data from the probes, or weather conditions cause a significant change in the pond?

