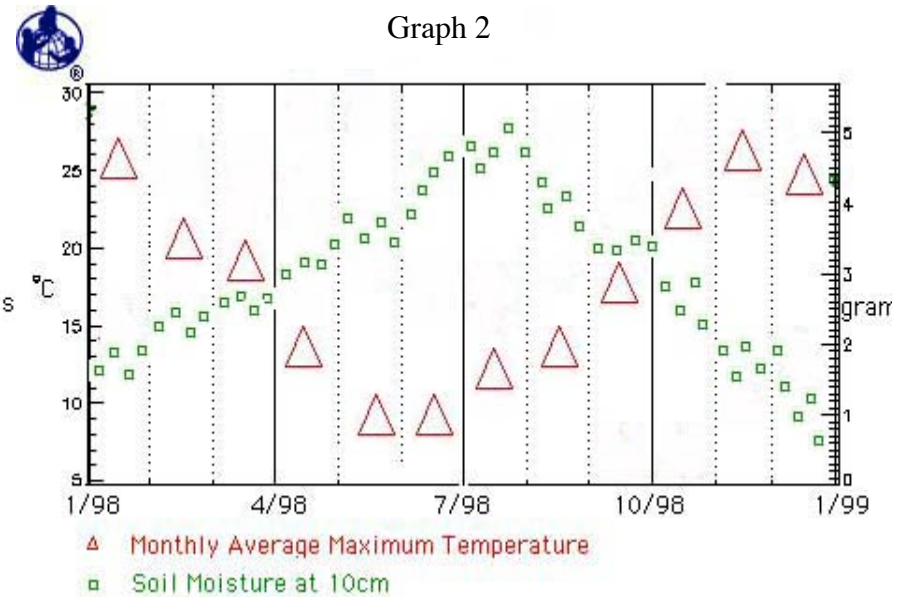
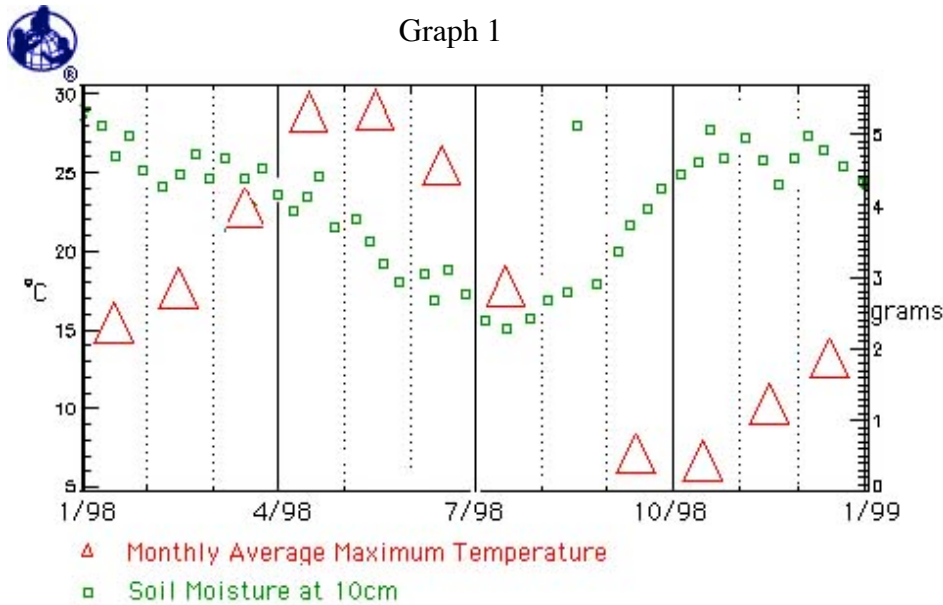


SOILS INVESTIGATION AREA
GLOBE SAMPLE STUDENT ASSESSMENT TOOL – HIGH SCHOOL



(Present problem requiring use of GLOBE data archives)

The Standard Weather Service for North America recently collected the data in the graphs shown above. The data shows temperature and soil moisture information for the year 1998. However, due to a mislabeling of files from an outside agency, the two graphs are for a single site in North America – clearly a mistake. Since a single site cannot have completely different readings for the same time period, the correct data set must be determined. The Standard Weather Service is in the process of preparing their annual weather report for all the major cities in Canada, Mexico, and the United States. You have been hired as a consultant to a) determine which set of data is the correct set for the site in North America and b) to help with the analysis of the data.

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- 1) **(Interpret GLOBE Data: Create multiple formats for representing data)** After collecting data, scientists often have to determine the best way to view it – should they look at it in a data table, in a line graph, or perhaps as a bar graph? Often, they represent or show the data in a variety of formats. What is one reason why you think scientists might want to have several representations to look at? In this investigation the data was presented in a line graph form. Using both graphs 1 and 2, make a table that shows the average maximum temperature each month for the two sites. You should use the middle of the triangles on the graph to determine temperature.
- 2) **(Interpret GLOBE Data: Create multiple formats for representing data)** To give yourself another way to view the given data, convert the data table you made in question 1 into a bar graph. For each month show one bar for graph 1 and another bar for graph 2.

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- 3) **(Interpret GLOBE Data: Create multiple formats for representing data)** Scientists sometimes find it helpful to use the average of a group of measurements instead of trying to analyze every data point. This is sometimes called “cleaning the data.” What would be one reason that you can think of why a scientist might want to do this? To try this out for yourself, make a data table that shows the average soil moisture per month for each graph.
- 4) **(Interpret GLOBE Data: Infer patterns, trends)** Scientists use their different representations of their data to help them uncover “trends” or patterns in the data. These trends often show a relationship between several variables. For example, a scientist might want to know if there is a relationship between temperature and amount of rainfall in a certain region to help her understand the plant growth in the area. What is a possible trend or pattern that you see between the maximum temperature and soil moisture when looking at the site 1 line graph? How about for the site 2 line graph?
- 5) **(Interpret GLOBE Data: Infer patterns, trends)** Repeat what you did in question 4 but instead use the representations you created in questions 1, 2, and 3 above. What trend or trends do you see? Are they the same trends that you saw in question 4? Which type of representation (line graph, data table, or bar graph) was the most helpful in trying to see trends in this data? Why?

SOILS INVESTIGATION AREA
GLOBE SAMPLE STUDENT ASSESSMENT TOOL – HIGH SCHOOL

- 6) **(Plan Investigations: Set up new problem)** While analyzing data, scientists often come up with reasons why they think there are certain relationships between variables. Given the relationship you suggested in the question above, what hypothesis might you make as to why this is? How would you test your hypothesis? What additional data from the GLOBE database would you need to help determine if your hypothesis was correct?
- 7) **(Taking GLOBE Measurements: Errors are detected; use quality assurance)** Having collected data for the GLOBE database before, you know that you have to be very careful and accurate when collecting data. Look at the Site 1 graph. Are there any data that you suspect might be due to a measurement error? How can you tell? What would you tell someone who is collecting data to ensure that this doesn't happen again?
- 8) **(Interpret GLOBE Data: Explain data & relationships)** Looking any of the data representations you have, which site seems like it would be in North America? Why do you think so? What additional data from the globe database might be useful to help you confirm or disconfirm your hypothesis?
- 9) **(Communicate: Compose reports to explain or persuade)** Using the data analysis you have done, write a short report (1-2 pages) that summarizes your findings and explains which data set fits a site located in North America. Be sure to support your conclusions with data you have analyzed.