HYDROLOGY INVESTIGATION AREA
GLOBE SAMPLE STUDENT ASSESSMENT TOOL – HIGH SCHOOL (1)

(Given data from the GLOBE data archives)
GLOBE Data for Holcomb Elementary School and Jefferson Elementary School, Fayetteville, Arkansas

Holcomb Elementary

YY/MM/DD	WATER TEMP(°C)	pH
99/01/24	2.5	8.9
99/01/17	3.2	8.8
99/01/10	3.5	8.8
99/01/03	3.8	8.7
98/12/27	4.0	8.8
98/12/20	4.1	8.8
98/12/13	4.3	8.8
98/12/06	4.2	8.7
98/11/29	4.2	8.7
98/11/22	4.3	8.6

Jefferson Elementary

YY/MM/DD	WATER TEMP(°C)	pH
99/01/24	4.0	8.7
99/01/17	41	8.6
99/01/10	4.5	8.6
99/01/03	4.8	8.6
98/12/27	5.5	8.5
98/12/20	6.0	8.4
98/12/13	6.2	8.4
98/12/06	6.4	8.3
98/11/29	6.4	8.1
98/11/22	6.5	8.1

(Present problem requiring use of GLOBE data archives)
Holcomb Elementary and Jefferson Elementary are two schools located within 5 miles of each other in Fayetteville, Arkansas. Both schools sit next to the same river, with Holcomb located upstream from Jefferson. Even though the schools are relatively close to each other, the plant and fish life appears to be different between the two sections of the river. You and several other students have been asked to report to your science class what some of the differences are and why you think they exist. To the left is data from the two schools between late November and late January to help you in your investigation.

1) **(Plan Investigations: Pose relevant questions)** Look at the GLOBE data in the tables. Think of two questions you might ask regarding the data. A sample question might be "What is unusual regarding water temperature between the two schools considering they take measurements from the same river?

2) **(Interpret GLOBE Data: Infer patterns & trends)** One of the students in your research group, Tom, suggests that many trends can be seen in the data. Describe one trend related to pH.

3) **(Take GLOBE Measurements: Use quality assurance procedures)** You have watched some of the students at your school collect GLOBE data and you've noticed that they have done a very good job. Just to check, are there any data that you suspect might be due to a measurement error? How can you tell? What would you tell these students to insure that measurement errors do not happen?

4) **(Interpret GLOBE Data: Explain data & relationships)** One of the students in your science group, Hilda, remembers showing the relationships between variables in her math class and suggested doing the same with the GLOBE data. What is the relationship between water temperature and pH for Jefferson Elementary? For example, if water temperature increases, what happens to the pH level?

5) **(Interpret GLOBE Data: Create multiple formats to represent data; explain data & relationships)** Using the data provided for Holcomb Elementary, create a graph using that has time on the x-axis and pH on the y-axis. Describe how the pH is changing over time.

6) **(Interpret GLOBE Data: Create multiple formats to represent data; explain data & relationships)** Using the data provided for Jefferson Elementary, create another graph with temperature on the x-axis and pH on the y-axis. Describe the relationship you see between pH and temperature.

7) **(Interpret GLOBE Data: Explain data & relationships)** One of the students in your science group, Debbie, mentioned that pH can affect fish and plant life. If the pH level dropped by 3 in the month of December for either of the schools, what would be the concern regarding life in the river?

8) **(Plan Investigations: Set up another problem)** In the questions so far you have been looking at water temperature and pH. Randomly choose another site in the GLOBE database, pick a different variable that you would investigate, and choose a set of 10 dates in chronological order for the same time period to use as your data. Pick another trend to investigate. Why does this trend look interesting to you? What other surface water variables might you look at to tell you more about the particular trend you chose?

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 why you think the plant and fish life varies between the two schools. Be sure to support your conclusions with data you have analyzed and suggest other data that might be helpful for further study of the river.