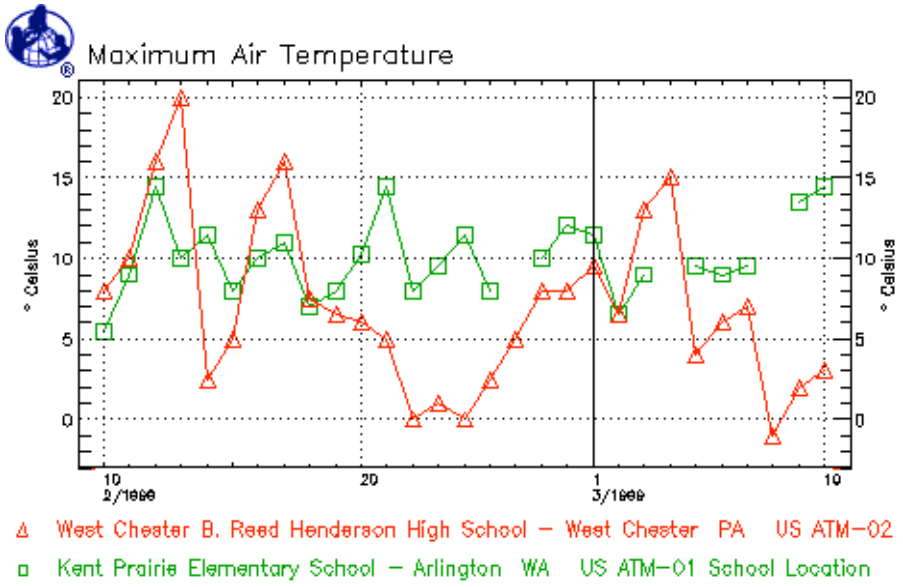
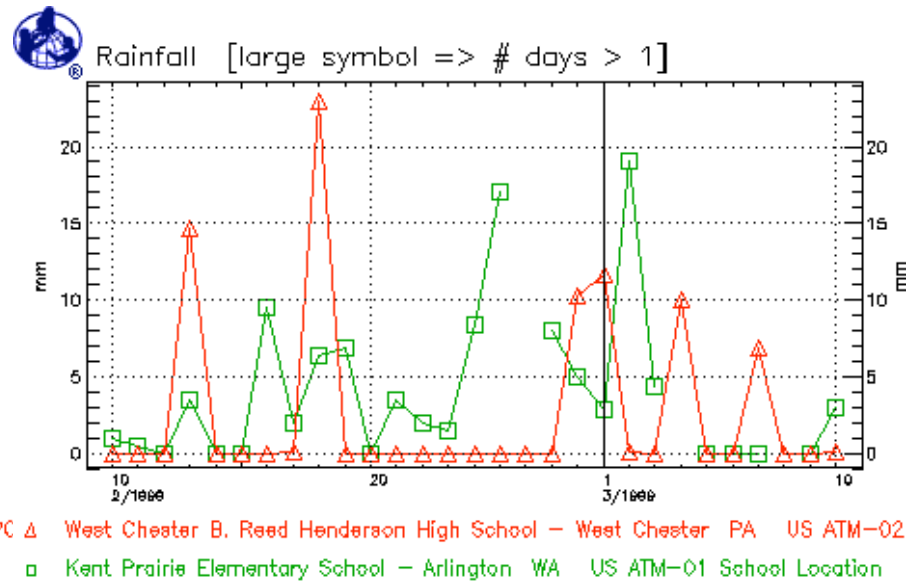
LAND COVER INVESTIGATION AREA
GLOBE SAMPLE STUDENT ASSESSMENT TOOL – MIDDLE SCHOOL

(Given data from the GLOBE data archives)
GLOBE Data for:
1) West Chester High School, West Chester, PA
2) Kent Prairie Elementary School, Arlington, WA

School	Latitude	Longitude	Elevation (m)
West Chester High School	39.9662 N	75.5977 W	338
Kent Prairie Elementary School	48.1832 N	-122.1198 W	157





(Present problem requiring use of GLOBE data archives)
West Chester High School and Kent Prairie Elementary are two GLOBE schools that have similar MUC codes. However, locations that have the same MUC may or may not have similar weather patterns. Recently, the two schools have decided to work together on a plant-growing science project and you and a small group of students have been asked to write the final report. The project involves finding which school has more favorable conditions for plant growth. Given air temperature and rainfall data from both schools your job is to help determine which environmental factor are most important to plants growing at the two schools.

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1) **(Plan Investigations: Pose relevant questions)** Look at the GLOBE data above. Think of two questions you might ask regarding the data. A sample question might be "Is there anything unusual regarding air temperature between the two schools considering they have the same MUC code?"

   One question I would ask: Do the peaks on the temperature graph match the peaks on the rainfall graph? Another question might be: Do gradual increases in temperature, say over a few days, relate at all to the amount of rainfall?

2) **(Interpret GLOBE Data: Infer patterns, trends)** One of the students in your investigation group, Martha, suggested that finding trends in different sets of data is sometimes helpful for analysis. What trend do you see regarding the air temperature for West Chester High School? What trend do you see regarding the rainfall for West Chester?

   For West Chester High School it seems that the temperature moves up and down gradually – it gets hotter, slowly cools down, slowly gets hotter, etc. The rainfall for West Chester seems to jump back and forth pretty quickly – it seems to rain on single days, not two days in a row (except for one place.)

3) **(Take GLOBE Measurements: Use quality assurance procedures)** You have watched some of the students at your school collect GLOBE data and you think they have done a pretty good job. What do you think are the three most important things to be careful of when collecting and reporting data?

   One thing I think is really important is to make sure you follow the protocol exactly - if you are not sure about how to take the measurement, read the protocol again. Another thing is after you have written the data down, look it over to see if it seems reasonable. Sometimes it is easy to put a decimal point in the wrong place or write the reading down in the wrong box. Another thing is to make sure when you are entering and sending the data to the database, check it over a few times to make sure you didn't make any mistakes – this is an easy place to make mistakes because sometimes you might hit the wrong key by accident or something.

4) **(Analyze and Compare GLOBE Data: Identify similarities and differences)** Another student in your investigation group, Antonio, mentioned that comparing data between two schools might be helpful in figuring out which school is the better one to grow certain plants at. Looking at the maximum air temperature graph, what are two things that look different between the two schools? In other words, what are two ways in which the graph line for West Chester High School looks different from the graph line for Kent Prairie Elementary School?

   One thing I see is that the graph line for West Chester jumps around a lot more – it seems to go from really high to really low and back up again. The graph line for Kent Prairie seems to be more compact – it moves up and down too, but only a little bit at a time. Another thing I see is that the temperatures for Kent Prairie are usually higher than the temperatures for West Chester.

5) **(Interpret GLOBE Data: Create multiple formats to represent data)** Using the maximum air temperature graph, look at the graph lines for the two schools for the week from February 15th to February 21st. Make a table that shows the temperature for each school on each of these days. How might this type of table be helpful in your search to find the school that can grow certain plants better?

	15th	16th	17th	18th	19th	20th	21st
West Chester	5 °C	13 °C	16 °C	7 °C	6 °C	6 °C	5 °C
Kent Prairie	8 °C	10 °C	4 °C	7 °C	7 °C	10 °C	15 °C

I think this type of table would be helpful if you needed to quickly see the exact temperature each day or to quickly find how much hotter one school was than the other on a certain day.

6) **(Interpret GLOBE Data: Create multiple formats to represent data)** Using the rainfall graph, make a table that shows the total rainfall for each school for February 10th – 20th, February 21st – 28th, and March 1st – 10th. Compare the amount of rainfall between the two schools. How may this table you just created be helpful in finding which school has more favorable conditions for plant growth?

Rainfall	10th – 20th	21st – 28th	1st – 10th
West Chester	38 mm	10 mm	29 mm
Kent Prairie	29 mm	44 mm	30 mm

I think this type of table gives you a better sense of which school has a greater amount of rainfall for a period of time like a full month. It is hard to see this right away when looking at the graph.

7) **(Analyze and Compare GLOBE Data: Identify data components)** When analyzing graphs there is a lot of information to be aware of. What does it mean if there is a break in one of the graphs? If you are looking at the maximum air temperature graph, what does the line between two data points mean?

A break in one of the graphs means that a measurement was not taken or not recorded by a school for that day. The line between two data points on the maximum air temperature graph shows the temperature changing – a sharp change in temperature if the slope is steep and a gradual change in temperature if the slope is slight.

8) **(Plan Investigations: Set up another problem)** Choose another school with the same or very similar MUC code from the GLOBE database and compare this school with the two schools above. What trends do you see from this new school? In other words, how is this school the same and/or different from the two schools given above? What other land cover variables might you look at to tell you more about the environmental factors at each school? Why did you choose these variables?

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 school site has more favorable conditions for plants. Keep in mind that not all plants require the same environmental conditions for growth. Be sure to support your conclusions with data you have analyzed and suggest other data that might be helpful for further study of the land cover sites.