Student Guide Activity 12 Students' Research Questions

It may surprise you to learn that many scientists ask questions, conduct investigations and find answers without ever collecting the data themselves. They do it by exploring data that already exists. With the experiences you have gained, you can do this, too.

You'll start by deciding on a research question. Your question needs to be one you can answer using the data available on the Graphing Tool. Here is a summary of the data you can work with:

<u>Cascade Brook, Jan. 2, 2009 - Dec. 31, 2009</u>
Cascade Brook Temp (°Celsius)
Cascade Brook DO (mg/L)
Cascade Brook pH (pH)
BRF Lowlands Temp (°Celsius)
BRF Lowlands Rainfall (mm)

<u>Hudson River (GWBr), June 1, 2009 - Dec. 3, 2009</u>
Hudson River Temp (°Celsius)
Hudson River DO (mg/L)
Hudson River Salinity (psu)

<u>Harlem River, June 4, 2009 - Sept. 17, 2009</u>
Harlem River Temp (°Celsius)
Harlem River DO (mg/L)
Harlem River Salinity (psu)

Open your Journal to start keeping track of your work by answering the questions below:

1. What is your research question, or what information would you like to try to find out?

2. What's the first thing you'll do to try to answer the question?

3. As you conduct your investigation, record the steps you take <u>as you take them</u> – not afterwards. List and describe each step below. If you make any changes in your investigation, that's fine – but explain why you made those changes.

4. When you finish your investigation answer the questions below. They will help you record both your results and your analysis:
   a. Were you able to answer your original question? If so, how would you answer it? If you weren't able to answer the original question, explain what you found out instead.

b. What evidence did you find in the data to help you with your investigation? Paste copies here of any graphs that gave you information related to your question.
c. How would you explain what you found out? (If your results make sense to you, explain why they do. If they were a surprise, what are some possible explanations for what you observed?)
d. Is there any other kind of data that would help you know whether your explanation is valid? If so, what kind of data would that be?
e. What questions do you still have? These might be questions that remain unanswered or they might be new questions.