1. Some of the main things you learned from the conference.

I learned some helpful things about experimental design and simple tricks to increase the level of inquiry in traditional labs:

a) A very simple change is to take away the data table so that students have to anticipate their data and develop it themselves.

b) A step further is to have students identify the variables.

c) Considering the 3 elements: question, methods, and conclusion. Increasingly chip away at whether teacher or students generate these.

d) When kids plan experiments, in addition to question, hypothesis, materials and methods, they ALSO need to plan what kind of data they plan to collect, how to do so, and how plan to display it. So early on, when they get approval for experiments, they need to demonstrate this, i.e. already have a data table prepared and sketches of charts/graphs.

e) See note below about hypotheses.

In the course we did a number of labs, and teachers also shared a number of labs that they have done in the past, some of which I may adapt for my 9th grade class. In particular, I will probably start the year with a pillbug behavior experiment. A few of the many other labs we did or ideas discussed that I might use: diffusion and osmosis lab, termite behavior lab, whole plant transpiration lab, lactose enzyme lab.

We had the opportunity to use dataloggers (probeware) for a plant respiration lab, and that was great. It seems to me that the kinds of questions that students can ask and explore are expanded by these tools as they enable the collection of a variety of kinds of data quickly and simultaneously. When lab time is limited, this seems even more valuable.

I liked several things AP Biology’s curriculum:

a) New inquiry-based format especially with labs (instead of confirmational labs, these enable various levels of inquiry, in which students develop the conclusion, methods, and/or question)

b) Vision of Biology in four “Big Ideas:”

   i) The process of evolution drives the diversity and unity of life.

   ii) Biological systems utilize energy and molecular building blocks to grow, to reproduce, and to maintain homeostasis.

   iii) Living systems store, retrieve, transmit, and respond to information essential to life processes.

   iv) Biological systems interact, and these interactions possess complex properties.

I did not like a few things:

a) The objective that the teachers have and the course by nature has is to prepare students for the AP exam. It felt to me at times like teaching to the test, at a high level. Other teachers noted that as well.

b) Teachers trade some of their freedom and flexibility in their own curricula and classroom timing in order to get the College Board approval to call the course “AP.” (See also note below about hypotheses.)

A note about hypotheses:

At the workshop, there were different approaches and opinions about "hypothesis." Apparently the AP sticks with the strict If…then statement. There were two teachers there who also teach at college level were surprised, and never teach that (it is out of date, not what real scientists do—take a look in scientific journals). In fact one (in concert with the rest of the science faculty of her high school) works with students to change if…then into better hypotheses: statements that are testable (measurable) with identified variables.

I poked around and found this from Duke U:

An hypothesis is an explanation of some observation or a phenomenon. A good scientific hypothesis contains the
following elements:
1. Description of the observation/phenomenon to be explained.
2. A clear, logically coherent description of the process(es) hypothesized to cause the observation/phenomenon.
3. A description of the consistency of the above descriptions with known facts and Accepted theories.
   a. What relevant observations/phenomena are explained?
   b. What relevant observations/phenomena are not explained?
   c. What observations/phenomena are incompatible with the explanation?
4. A description of how the hypothesis may be falsified.

http://biology.duke.edu/rausher/HYPOTHESES.pdf

I don’t quite know yet how I plant to shape expectations for hypothesis for 9th grade yet but this will all help shape it.

Would you recommend your experience to other Galloway teachers? Yes
Rank your experience from 1 to 10. 8