APSI Day Three Agenda

Thursday-AM

Warm-Up Question (5 Minutes)

In a randomly breeding population of mice, 640 had black fur and 360 had brown fur. Black fur is dominant to brown fur. The Hardy-Weinberg Principle ($p^2 + 2pq + q^2 = 1$) can be used to calculate allele and phenotypic frequencies.

(a) Calculate the frequency of the recessive allele.
(b) Calculate the number of homozygous black mice in the sample.

Activity (45 Minutes)

Diffusion activity with dialysis tubing (starch/iodine)
Play with this, tinker with different combinations of starch/iodine in the beaker/bag. Approach it with a beginner's mindset—much like your students will.
Fill dialysis tubing with different solutions of starch, iodine, and water and place the tubes into beakers with different solutions of starch, iodine, and water. Hypothesize as to what you think will happen and why.

Diffusion activity with various dyes (methylene blue/iodine/food color/etc)
In addition, use a cork borer and core out some holes at various spots on your agar plate. Be sure to keep the holes as far apart from each other as possible.
Next, drop the different solutions into each of the newly created wells. Be sure to keep track of what solutions you put into each hole.
After 45-60 minutes, we will use a ruler to measure the distance these solutions have diffused and pool our data and statistically analyze it.

Activity (45 Minutes)

Read and answer the first 10 questions of the practice exam and the first 2 grid-in questions. Turn to page 32 of your Workshop Workbook and read the directions. When you are finished, answer the questions on pages 33-35. Can you identify the LO to which the question belongs?

Activity (15 Minutes)

Collect the data from your Diffusion Activities.

Activity (30 Minutes)

Get into groups of 5 and identify the Big Idea, Science Practice, and Learning Objective to which each multiple choice and grid-in exam question addresses. When we are finished, we will share out with the larger group. This will help you to become more familiar with the Big Ideas, Science Practices and Learning Objectives and should help guide your teaching and syllabus development.

Break (15 Minutes)

Activity (30 Minutes)

Let's look at the Free Response Questions. Read through questions 7 and 8 and provide a skeleton of an answer of what you think the key points should be. Turn to pages 38 and 39 and answer the questions. Decide whether or not you think you are covering the content in enough depth to enable your students to answer these questions successfully.

Next, let's look at the scoring guidelines associated with these questions. Look closely at the Scoring Guidelines associated with these two questions. Do you cover the material thoroughly enough to allow your students to construct answers to these questions?

Activity (40 Minutes)
Write your measurement data from the dye diffusion activity on the board. We will do one of two things: we will either collaborate with the statistics people with our measurements, or we will use Excel to analyze our statistics.
Using your computer, enter the data into Excel to allow you to analyze the data.
When finished, await further instructions for calculating averages, standard deviations, linear regression, and for possible further analysis. You will use this analysis to support or refute your null hypothesis. You will also use the data to determine the molecular weights of the dyes for which no molecular weight is given.

Lunch (60 Minutes)

Thursday-PM

Afternoon Labs (180 Minutes)
Finish pGLO Lab (Big Idea 3)
Cell Respiration and Photosynthesis Lab (Big Idea 2)
Enzyme Lab (Big Idea 2)
BLAST Lab Extension (Big Idea 1)
Answer these questions:

1. What did I learn about the lab(s) today?
2. What are/were the key ideas?
3. What are some ways I can incorporate this into my classroom along with inquiry? If there are no ways to incorporate it, why not?
4. What did I understand well?
5. What do I need from others to help me so I understand it better?
6. How does it related to other areas of the curriculum?
7. What suggestions would you make to a colleague who has to do these activities in a non-lab based classroom?