BIOLOGY 3 LAB ORIENTATION

(revised 11/9/2010)

[10] The lab technician (that's me) can help you with computer and equipment problems, but I don't sign off on your lab work. If you have any equipment problems please contact me or the lab instructor. This equipment is very expensive, so please treat it gently. Oh, and these computers aren't linked to the Internet, so don't even bother…

[11] Most of our lab programs include questions that we want you to answer before continuing. To see if you've been paying attention, click on an answer to this question. Go ahead and see what happens if you pick a wrong answer, if you like. Click the arrow when you're ready.

[12] That's right – pencils should come into lab, food and drinks can NOT. Let's try another type of question. On this question, you will label the photograph. Click on an arrow and drag it to the correct place on the photo. When you think you've got all the labels in place, click the "Score this page" button to see how you did. When you get 100%, you can continue. If you don't get 100%, move the labels around until you get them all correct.

[13] Let's try another type of question, this time a multiple choice question. Click on the correct answer.

[14] And here's another type of question, where you arrange objects on the screen. Click the squares to move them into the correct position. If they're not right, the objects will click back to where they came from and you can try again.

[15] So you can see that the lab program allows you to work at your own pace, and it's up to you to make sure you understand the concepts before continuing. Well, that's it for me, and now I'd like to introduce you to one of the Bio 3 instructors, Professor Farris who will guide you through some basic exercises that you'll be using throughout the semester.

Exercise 1 - Metric Units

[16] Hello, this is Pat Farris. Welcome to the Bio 3 lab! Now let's get to work… To complete the next part of the orientation, you'll need to fill in the orientation exercise handout as we go. We've reached a part of the lab where you may want to go back to the beginning of a section and listen to the entire unit again, so from this point on, I'll include a "Main Menu" at the bottom of the page. When you finish your lab work for the day, just put the computer program back to the "Main Menu" for the next student. NEVER exit the program or turn the computer OFF.

[17] The first basic skill you'll need in Bio 3 is to learn the metric scale. Scientists use the metric system exclusively, so let's take a look at something simple, like the length units. I'm sure you've heard of a meter (it's about the same length as a yard). But for most of the things we measure in the lab, we'll be using subunits of a meter: the centimeter, millimeter and so on.

[18] This table lists these basic units and some helpful translations. For example the word "centi" means 100, just like the English word "cent" means one hundredth of a dollar. For metric length, there are 100 centimeters in a meter.

[19] The next smaller unit is the millimeter. "Milli" means 1000, so in this case there are 1000 mm in a meter. The handier conversion though, is to know there are 10 mm in a single cm. And there's the beauty of the metric system – the conversions between units are very simple. By the way, we won't get to the smallest unit, the micrometer, just yet. We'll save that one for our microscope work. Stop for a moment and look over the metric table, then begin the program when you are ready to start measuring.

[20] Now find the little plastic ruler hanging in your booth. Determine which scale is the metric scale. Go ahead and measure the first line on your handout and record the number of centimeters and make sure you include the tenths as well. Continue the program when you're ready.

[21] Did you get 5.5 cm? Excellent! Now convert this number into millimeters. You *could* count up all the teeny tiny lines on your ruler, or the simple way is to multiply 5.5 times 10, since there are 10 mm in every cm.

[22] Now complete Exercise 1 by determining the lengths of the next two objects on your handout in both centimeters and millimeters. Return to the program when you have that section completed and are ready to begin Exercise 2.

Exercise 2 – Qualitative and Quantitative Observations

[23] Welcome back! Our next basic science topic is how to make meaningful observations, something we'll be asking you to do all semester. The two basic types of observation are referred to as qualitative and quantitative. Take a look at the definitions of these two terms.

[24] Notice that qualitative observations are descriptions of objects, such as the color, shape, texture or smell. Quantitative observations must include a number.

[25] Scientists rely much more on quantitative observations, in other words, numerical measurements of objects or quantities of objects. When you can measure something, there is no room for argument.

[26] At the demonstration table we have a variety of objects. You can choose any three of the six objects to fill in the table on your orientation handout. Please make a qualitative and a quantitative observation for each of the three objects you've chosen. I'm sure you'll want to take along your trusty ruler for the quantitative measurements, and make sure you use the metric scale. Return to the program when you have finished the table in Exercise 2.

Exercise 3 – Graphing Data

[27] Our last orientation exercise will introduce you to the two types of graphs we use during the labs, point graphs and histograms. As we collect data in the labs, it will be important for you to understand what these two graphs represent.

[28] Take a look at the point graph example shown here. This data shows the body temperature of a woman as she wakes up each day. By looking at the very slight temperature drop, she can gauge the time of the month when she is probably ovulating. Each day has one data point (one temperature) so it makes sense to draw a point graph for this type of data.

[29] The next type of graph, the histogram, is used to show how frequently a certain value occurred. This is used to quantify how many data points fit in a particular classification. Notice how the data essentially "piles up" for each category.

[30] Okay, now you're on your own to graph some data. For our last exercise, take a look at the data shown here on the screen and determine if it should be represented with a point graph or a histogram. Return to the program when your graph is complete.

[31] Well that's it for the Bio 3 orientation! You must turn in the orientation handout to the lab instructor on duty to get credit for the Orientation. If you already have your lab manual and would like to begin Lab 1, click the blue button to get started. If you've had enough science for today, and would like to come back later in the week to start Lab 1, that's fine too. If you are logging out, make sure you record the time spent in lab for today. See you soon!