This should be done as soon as possible after lecture.

I highly recommend forming study groups to review and discuss the content. There is no penalty for everyone doing well!

What to do:

1. Return to the lecture slides and look at the question slides.

- For each question, write down an answer that you could communicate to a classmate. Try to use proper vocabulary. These questions serve as self-assessments of certain concepts, ideas, or basic knowledge.
- If you are not sure about the answer to a question, use the reading, the podcast, or the internet to formulate an answer.
- If you are still confused, talk to your classmates about it.
- If you still do not understand some concepts or if you have some new cool thoughts, visit your TA and/or professor at office hours.

2. Review any new vocabulary that came up in class or in the reading that you don't know or can't define quickly. Write down the definitions on a sheet of paper or electronic document that you can review and add to later—some students have found it fun and useful to create a running list that they annotate or illustrate. Also, try to use the vocabulary term in a sentence. KEEP AND EXPAND THIS DOCUMENT FOR THE DURATION OF THE COURSE.

**I'll give the advice above for every post-lecture study guide. These are just good study habits.

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3. Today's class was mostly about logistics - we spent a whole class trying to get ourselves on the same page so that the quarter can go smoothly for everyone. Therefore, while the class didn't cover "hardcore" course content, it was still important. Make sure that you:

- Have registered with Nota Bene using your UC Davis email - other emails will be deleted.
- Can you log into the reading assignments and post comments. Some students have run into login issues that seemed to be solved by quitting the browser, opening it again, and logging back into nb.mit.edu. In addition, see the document and screencast available linked from the front page of the course Canvas site.
- Have read the syllabus in detail (if you haven't done so already) to be sure that you understand the course policies and know important dates. Take the time to get any course policy questions answered now/soon so you won't be surprised later.

4. Revisit your list of properties shared by all living things that we derived in class. Are there ideas that came up in class that are missing from your list? Are there any that you disagree with? Anything you would add. Try to really think about this and refine your conclusion.

5. We started this exercise in class but now with a little more time try to add content of your representation of a cell as follows:

- Draw your mental picture of what a cell looks like. **Fight the urge to go to the Internet or books for models - the point of the exercise is to get a basic idea at the beginning of class of where *your own* mental model stands, and** copying would

defeat the point**.** I'll ask you to do this several times during the quarter to reflect on what you've learned and how your mental picture is changing. It'd be great if you can share this on Wednesday.

The above is practice for LG1.5 - (1.5) Create a conceptual drawing of a cell that reflects your current mental model for how several requirements for life appear, and we'll discuss this in class on Wednesday. After that class, you can return to what you did with a new perspective and re-evaluate your ability to achieve this learning goal.

PRACTICE EXAM QUESTIONS

Because we've just started with these concepts, these are relatively basic questions. Try to relate these questions to the learning goals and use them to test yourself. In the cases below we've drawn from the reading. As you go through these questions, try to get used to the idea that on multiple-choice tests, just because an answer choice is a true statement doesn't mean that it is the best answer to the question. More stuff related to the lecture discussion starting on Wednesday.

Question Q1

Practice for: (F2) Identify the dependent and independent variables as well as the control and test groups from a description of an experiment.

Q1 Bob and Jill are interested in seeing how what they eat is related to (a) their weight, (b) their waist sizes, (c) their hair color, and (d) their breath. They want to test the hypothesis that given the same number of calories, the source of the calories can have different effects on weight, waist size, hair color, and breath.

They start by eating their normal diet and measuring their weight, waist size, hair color, and breath each day for three weeks. Next, they each set up an experiment where they eat nothing but meat and water for three weeks. Each day they record their weight, waist circumference, hair color, and breath. Taking care to normalize total calories between experiments, Bob and Jill then eat nothing but vegetables and water for three weeks. Again they record weight, waist circumference, hair color, and breath every day. Which statement is correct?

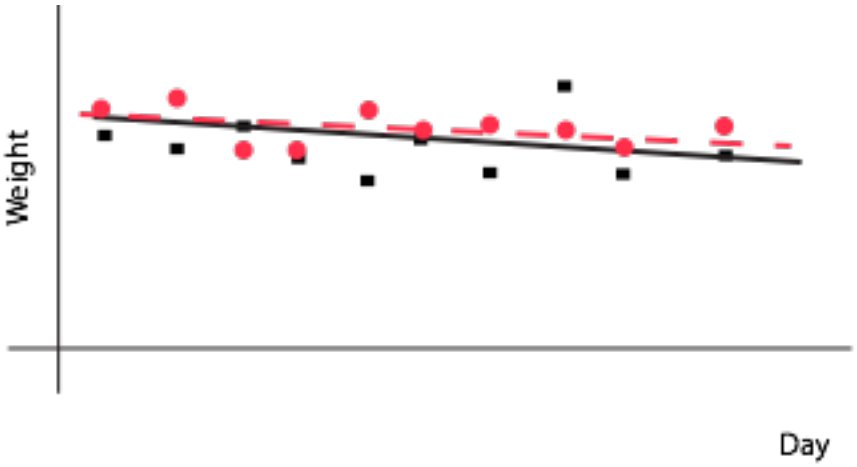
(a) Weight, waist size, hair color, and breath are dependent variables. The food type (meat or vegetables) are the independent variables. Their null hypothesis is that the source of calories will have no differential influence on weight, waist size, hair color, and breath.
(b) Weight, waist size, hair color, and breath are independent variables. The food type (meat or vegetables) are the dependent variables. Their null hypothesis is that the source of calories will have no differential influence on weight, waist size, hair color, and breath.
(c) Weight, waist size, hair color, and breath are dependent variables. The food type (meat or vegetables) are the independent variables. Their null hypothesis is that meat will have a larger effect on weight, waist size, hair color, and breath.
(d) Weight, waist size, hair color, and breath are independent variables. The food type (meat or vegetables) are the dependent variables. Their null hypothesis is that meat will have a larger effect on weight, waist size, hair color, and breath.

Here we don't explicitly test the part of the learning goal associated with identifying a control and test group but you could, and should, use it as an opportunity to ask yourself how we might do that. Try to rework the question to test that part too.

Question Q2
Practice for: (F3) Analyze and interpret data to reach a conclusion about an experiment and its hypotheses.

Q2 In the figure below, Bob presents his data for his weight on the "normal diet" (black line and data) and the meat-and-water diet (red dashed line and data). Similar looking data were collected for the vegetable and water study. From these data, you would most likely conclude:

(a) Bob proved his and Jill's hypothesis.
(b) Bob could not reject his null hypothesis.
(c) Bob rejects his null hypothesis and his test hypothesis.
(d) Bob rejects his null hypothesis and the data are consistent with his main hypothesis.
(e) Bob cheated on his diet.



Question Q1.3 An easy question—anything like this would likely appear as part of a broader question on an exam.
Q1.3 A Ca^{2+} ion has a charge of +2. What can be said about the relative number of subatomic particles in this ion?

(a) The ion has equal numbers of protons, neutrons, and electrons.
(b) The ion has two fewer neutrons than protons or electrons.
(c) The ion has two more protons than neutrons and electrons.
(d) The ion has two fewer electrons than protons and neutrons.
(e) There is not sufficient information to reach a conclusion.