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I start the year off with an AP Biology “Skillz” unit. This sheet is part of a series:

Document	Notes
0.0 Science Practices & More (AP Bio Intro to Class)	Free resource!
1.0 Models (SPs 1 & 2) ← you are here	Free resource!
1.1 Scientific Methods (SP 3)	Free resource! Key available here .
1.2 Graphing (SP 4)	Free resource! Key available here .
1.3 Practice Worksheet for Science Practices 1-4	Key is included with resource.
2.0 Some Math and Basic Stats (SP 5 Part 1)	Free! Access to a free corresponding slideshow here . Key available here .
2.1 Intro to Standard Deviation (SP 5 Part 2)	Key is included with resource.
2.2 Practice Worksheet for basic stats and SD (SP 5 Part 3)	Key is included with resource.
2.3 Intro to Standard Error (SP 5 Part 4)	Key is included with resource.
2.4 Trichomes FRQ - print & assign FRQ 1 as HW (SP 5 Part 5)	Scoring guidelines from the College Board
2.5 Chi Square (SP 5 Part 6)	Key is included with resource.
3.0 Augmentation (SP 6)	Key is included with resource.
Bundle of all of these sheets found here .	

Teacher notes:

I start the year off with a “Skillz” unit. After going over my [Science Practices & More](#) sheet, we talk about the first two practices in detail, which have to do with models.

Even if some of the content is beyond student knowledge at the beginning of the year, I still have them discuss what the models show and have them try to understand what’s happening as best as they can. They actually know more than they think they do!

As you go over this worksheet with students, have them discuss the models with a partner or in a group. See what they can tell you about the models- what do they see? What do the arrows mean? What patterns exist? What information could they answer right now, with their knowledge at this moment?

Make this worksheet a springboard for discussion and starting to dissect images - because the AP test is FULL of images that students may need to analyze to understand.

Doing this at the beginning of the year also allows you to start bringing in some concepts & vocab terms that students should have learned in Gen Bio, but may have forgotten. It’s a gentle reintroduction to some content before you really start to dig into the course!

For example, with the CFTR model (top of back page), I see what my students remember about the relationship between DNA/RNA, the central dogma, organelle function, etc. I ask them if they know what “cellular expression” means. We work through the problem as a group, combining knowledge in order to be able to complete the model as directed in the prompt.

The next sheet in this series is [1.1 Scientific Methods](#).

Like what you see? More of my AP Biology resources [can be found here](#).

Name _____

SPs 1 & 2- Models

SP 1	Concept Explanation: Explain biological concepts, processes, and models presented in written format.	Describe or explain biological concepts and/or processes in applied contexts.
SP 2	Visual Representations: Analyze visual representations of biological concepts and processes.	Describe characteristics and explain relationships of items represented visually. Represent relationships within models (mathematical, diagrams, flowcharts).

“In science, models are used to represent a system (or parts of a system) under study, to aid in the development of questions and explanations, to generate data that can be used to make predictions, and to communicate ideas to others.”

- NGSS Science & Engineering Practices

You will be working with LOTS of models in AP Biology. All of these are models:

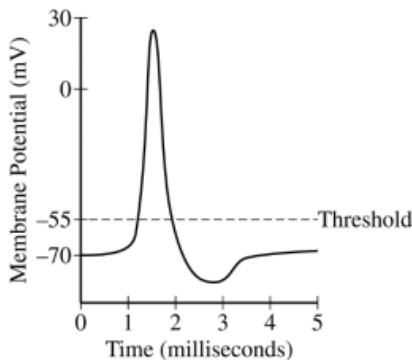


Figure 2. Model of a typical action potential in a neuron

The following models represent all the interacting species in two different communities with some of the same species and feeding relationships. These models assume that both communities have the same initial biomass. The models can be used to understand the effects of human activities on the communities.

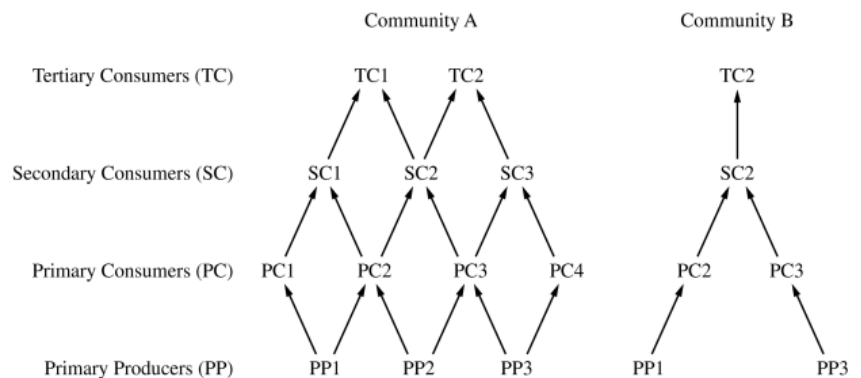
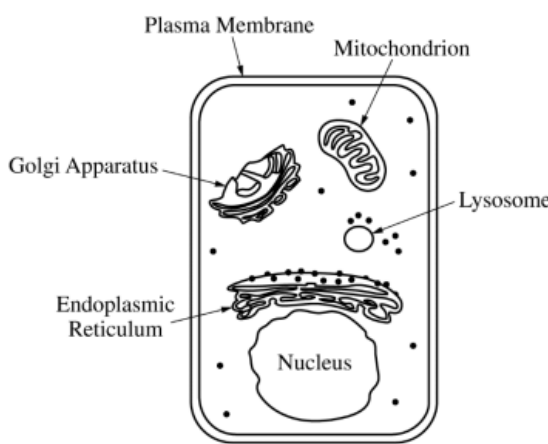
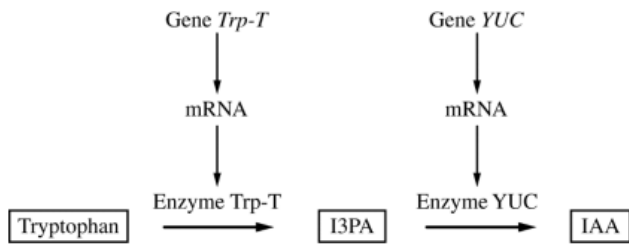
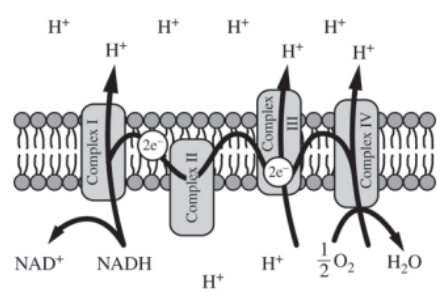


Figure 1. Models of two different communities with some of the same species

TABLE 1. CHANGES IN MORNING GLORY PETAL CELLS DURING FLOWER OPENING

	BUD	OPEN FLOWER
Vacuole pH	6.6	7.7
Flower Color	Red	Blue
Cell Volume	Small	Large

Here are some things you may have to do with or do to models:

Represent, add to, draw, create Add to an existing model Create a model	In the provided model of a cell, draw arrows to describe the pathway for production of a normal CFTR protein from gene expression to final cellular location. 
Describe, use, predict Interpret models Use models to make a prediction Use models to explain a concept	First, describe what the model shows. Then, predict how the deletion in a gene that codes for <i>Trp-T</i> would affect the production of IAA. Justify your prediction.  Figure 1. Model of two-step enzymatic plant pathway for synthesis of IAA from tryptophan Explain where the energy comes from to move protons against their gradient.  Figure 3. Electron transport chain