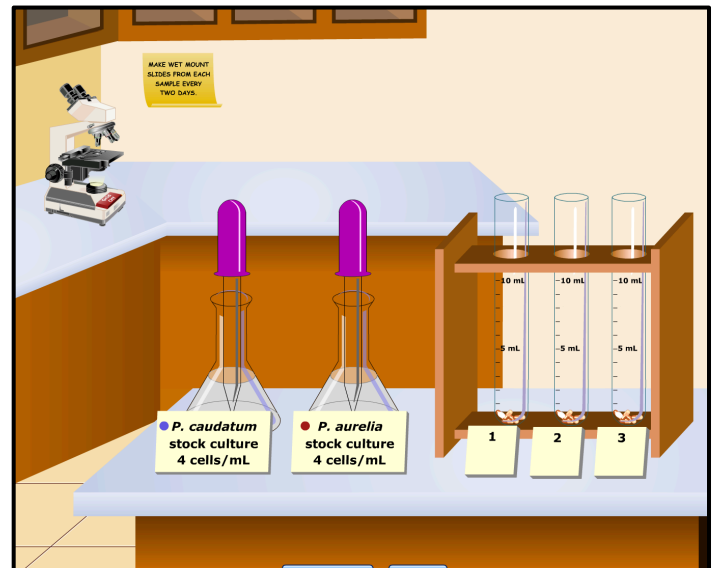
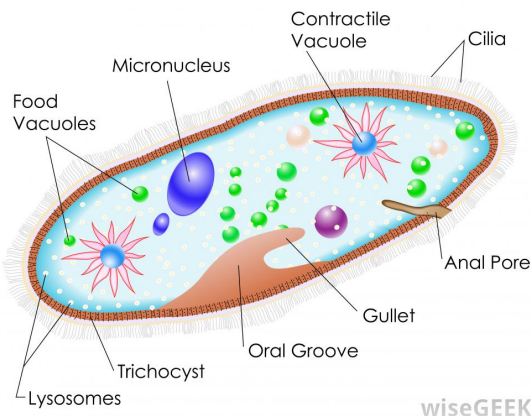


# Lab: Population Biology

## BIOLOGY: Interactions in Ecosystems

**Purpose:** In this investigation you will conduct an experiment and grow two species of the protozoan *Paramecium*, alone and together. You will then compare growth curves of the populations of each species.



### Procedure:

1. Go to: [http://glencoe.mcgraw-hill.com/sites/dl/free/0078757134/383928/BL\\_04.html](http://glencoe.mcgraw-hill.com/sites/dl/free/0078757134/383928/BL_04.html)
2. Click the "Information" button to read about *Paramecium* and about population growth and competition.
3. Begin the experiment by filling the test tubes with samples from the stock cultures in the flasks. Click the bulb at the top of the pipette to fill the pipette with culture. Then click and drag the pipette to a test tube. Fill the three test tubes with the *Paramecium Aurelia*, *Paramecium caudatum*, and/or a combination of both. Note: There is rice in the test tubes. The rice is food for bacteria, which in turn will be food for the *Paramecium*. The two species of *Paramecium* to not prey upon each other.
4. Answer questions 1 and 2 in Analysis and Conclusion before you proceed.
5. Click the microscope on the back shelf to go to the lab bench. Then you will make wet mounts of the samples.
6. Click the Clean microscope slides box to set up clean microscope slides
7. Click the test tubes to prepare wet mount slides of the samples.
8. Click and drag a wet mount to the stage of the microscope. Count or estimate the number of cells of each type of *Paramecium*. Click the Grid On button for help with counting.
9. Record you data in Data Table #1 (below). Note: The well in the microscope holds 0.5mL. You need to multiply by 2 the number of cells you counted or estimated in order to obtain the concentration per mL.
10. Click the Clear Slides button. Click the Calendar to advance it by two days. Then get a new set of clean slides, place samples on them, and count or estimate the number of *Paramecium* you see. Record in Data Table #1.
11. Continue the steps above until the Table is complete.
12. Graph your data on the graph provided (page 3). Remember to title your graph and label both the x and y-axis. This will be a line graph (Growth versus Time). Draw 4 separate lines using different colors to represent the 4 growth patterns.
13. Answer the remaining Analysis an Conclusion questions (2-8)



4. On what day did the *Paramecium caudatum* population reach the **carrying capacity** of the environment when it was grown alone? How do you know?

5. On what day did the *Paramecium aurelia* population reach the **carrying capacity** of the environment? How do you know?

6. Explain the differences in the population growth patterns of the two *Paramecium* species. What does this tell you about how *Paramecium aurelia* uses **available resources**?

7. Describe what happened when the *Paramecium* populations were mixed in the same test tube. Do the results support the principle of **competitive exclusion**? (You may need to briefly explain competitive exclusion.)

8. Explain how this experiment demonstrates that no two species can occupy the same **niche**.

*Graph: Remember to title your graph and label the x and y axes (with units)*

