**Competition**

*Go to the Competition Simulation at* [*www.biologysimulations.com*](http://www.biologysimulations.com)

**Experimental Question:** How is a species’ population dynamics affected by the presence of another species with the same niche?

**Write a hypothesis:**

**Procedure:**

1. Read the Introduction.
2. Set Blue to 10 and Gray to 0. Run three times and record the estimated carrying capacity and the number of generations it took to reach the carrying capacity. Also, record a general description of the results.
3. Set Blue to 0 and Gray to 10. Run three times and record the estimated carrying capacity and the number of generations it took to reach the carrying capacity. Also, record a general description of the results.
4. Set both Blue and Gray to 10. Run three times and record the estimated carrying capacity and the number of generations it took to reach the carrying capacity. Also, record a general description of the results.

**Data:**

 





Find the average growth rate for the period prior to reaching the carrying capacity and record below ((Carrying capacity – 10) / Time).



*Graph:* Make a graph to compare the growth rates.

**Discussion:**

1. Compare the blue and gray carrying capacities when alone in the ecosystem.
2. Compare the blue and gray growth rates when alone in the ecosystem.
3. How is the blue species affected by the presence of the gray species?
4. How is the gray species affected by the presence of the blue species?

**Follow-up:**

1. Does either starting population or plant population affect the carrying capacity when blue and gray are alone in the ecosystem?
2. Use the simulation to test this. Summarize your results.
3. Explain your results to answer the question.
4. Does either starting population or plant population affect the outcome when blue and gray are together in the ecosystem?
5. Use the simulation to test this. Summarize your results.
6. Explain your results to answer the question.
7. Describe the competitive exclusion principle and explain how the results of the simulation apply.
8. Research and describe Georgy Gause’s *P. caudatum* and *P. aurelia* experiment.
9. Competitive exclusion is rarely observed in ecosystems. Propose an explanation for this.

**Conclusion:**

Based on your results and research, answer the original experimental question: How is a species’ population dynamics affected by the presence of another species with the same niche?