

Tragedy of the Commons Simulation

PURPOSE AND BACKGROUND

The purpose of this simulation is to explore how resources are used and exploited when they are available to everyone. The "tragedy of the commons" is the situation in which individuals use a common resource for their own personal gain and degradation of the commons results, leading to a decrease in yield for both the group and the individual.

MATERIALS

- Goldfish (DO NOT EAT THEM)
- Plastic spoons
- Small bowl

PROCEDURE

Sit at the tables in groups of 8. Each person requires food. The only food source for these table groups is a small fishing lake that can accommodate a maximum of 40 fish. Fortunately, after each round of fishing each remaining fish is able to spontaneously reproduce and make one new fish (i.e. 4 fish become 8, to a maximum of 40—this maximum is due to limiting factors in the ponds, such as dissolved oxygen, food, etc. that the fish are dependent on to survive). Each person is allowed to take as many or as few fish as you want, but you must take at least one fish or you will starve.

In this simulation, our lake is a plastic bowl, and our fish are goldfish crackers. Fish are caught using plastic spoons "nets". Each round of fishing will last for 1 minute. You should rotate your fishing order every round so that everyone has a chance to go first. At the end of every round, the number of remaining fish will be doubled to simulate reproduction. The simulation will continue for several rounds.

Your results section should include data tables, graphs, and the answers to the following questions for each part in complete sentences.

- The total number of fish caught by each person
- Your "management score" = what percent of the total possible amount of fish that could be caught by what all the fishers actually caught? (Show your calculations!)

ANALYSIS

Discuss your results in paragraph form, and make sure that you address the following questions:

- What happened to the fish population in the common lake? Why?
- What happened to the fish population in the private lake? Why?
- Compare and contrast your fishing technique for Part 1 and for Part 2?
- Why does common usage lead to exploitation?
- What would be the ideal way to manage the common lake?
- What is your management score and what are some ways that you could use to improve it?

CONCLUSION

Briefly summarize the results of this simulation, and discuss the implications of this simulation on the management of common resources in the environment. What other resource management examples can you think of where this topic is relevant? What would you suggest in these situations?

RESULTS

Part 1: Common Lake

Round #	Initial # of fish	# taken by fisher 1	# taken by fisher 2	# taken by fisher 3	# taken by fisher 4	# taken by fisher 5	# taken by fisher 6	# taken by fisher 7	# taken by fisher 8	Total left at the end of the round

Part 2: Private lake

You now have a small lake of fish from the previous activity. Place a maximum of 6 fish in your private lake and the rest of a napkin. You will conduct the same simulation as before except you will fish from your own private pond and you will use the fish on your napkin to replenish the fish population at the end of each round.

Round #	Initial # of fish	# taken by fisher 1	# taken by fisher 2	# taken by fisher 3	# taken by fisher 4	# taken by fisher 5	# taken by fisher 6	# taken by fisher 7	# taken by fisher 8	Total left at the end of the round

Graphing:

Graph the results of each simulation common and private pond (Rounds versus Fish Population)

Now you can eat the fish!