Tragedy of the Commons Lab

Purpose: To understand the Tragedy of the Commons and the depletion of shared natural resources.

Step 1: On your own paper make copy the table below.

FISH DATA TABLE 1

Years	Number of fish in the lake [after reproduction]	Number of fish you caught this year	Total number of fish Everyone caught this year
Year 1			
Year 2			
Year 3			
Year 4			
Year 5			

Step 2: **Groups of four only!** Each one of you represents the head of a family that is starving. In order for your family to survive, you must catch enough fish (pennies) for them to eat. The only food source is a small local lake which can hold up to **16 fish** (pennies). Once a year you will get a chance to fish and each time you fish **you may take 0, 1, 2, 3, or 4 fish** from the lake. It is your choice how many fish you take, however, **if you only take one fish, your family will starve**. If you take more than 2 fish, you can sell them for a profit. The fish in your lake will reproduce once a year. Keep the fish that you "catch" in front of you. No talking during fishing!

1. Did anyone in your group take too many fish? How did that make you feel? Does society reward those with the "most"?

2. Did anyone sacrifice the # of fish, for the good of the community? Why or why not? Does society ever reward that type of person?

3. Look up the term **sustainabilit**y in your textbook. Explain how the village could have maintained sustainability in this lab.

4. Distinguish between renewable and nonrenewable resources. Give examples for each.

7. Look up the term **ecological footprint** in your textbook. How does this concept relate to the concept of the tragedy of the commons.

8. Recall our lab confabulations on the tragedy of the commons. What were the five scenarios that were discussed as a class? Considering these five scenarios and today's lab, how can society avoid the tradegy of the commons? Justify your response.

DO NOT WRITE ON PAPER

Tragedy of the Commons: Depletion of shared resources or commons (SB4d)

These are the five scenarios that were discussed in class.

The Tragedy of the Herdsman

Picture yourself in a rural setting with villages surrounded by grassland open to herdsmen to graze their animals. This "commons" is available to all without restriction.

Imagine that the common pasture is supporting the maximum number of sheep that it can. There is just enough grass to keep all the sheep well fed, but no more. Adding sheep would mean less food for each.

However, for each herdsman it appears to be an advantage to increase the size of his herd. More sheep means more wool and more income. There is also a disadvantage in doing this: there will be slightly less food for each of his sheep. But this disadvantage appears small since it is spread among all the sheep, including those of the other herdsmen. So from the point of view of each herdsman, the gain is great and the loss is small.

The tragedy is that when all herdsmen act this way, the small losses add up to a disaster for everyone.

The Tragedy of the Traffic Jam

A modern example of a "tragedy of the commons" is traffic jams in major cities. A public good gets overused and lessened in value for everyone. Each individual trying to get to work quickly uses the freeway because it is the fastest route. In the beginning, each additional person on the highway does not slow down traffic because there is enough "slack" in the system to absorb the extra users. At some critical level, however, each additional driver brings about a decrease in the average speed. Eventually, there are so many drivers that traffic crawls at a snail's pace. Each person seeking to minimize driving time has in fact conspired to guarantee a long drive for everyone.

Failing Fisheries

We see this same pattern in fisheries around the world. The oceans are not owned by individual fishermen or controlled by countries. They provide a common resource of fish. As the number of fishing boats increases year after year, the total catch increases. Sounds good, right? However, as the total catch increases, it reduces the fish population's ability to restore itself.

Eventually the total individual and collective catch drops. This puts more financial pressure on fishermen to try to catch even more fish. Catching more fish only erodes the restoration capacity of the fish population even more. What would you do if you were a fishing boat captain faced with these issues? You can find out for yourself by playing the *Fishing Game*.

Waste in Our Waterways

In some cases the problem is not one of taking too much from a common resource. Instead the problem is putting too much in. With a small population it is not a problem to dump waste into a river. Waterways cleanse themselves with time. As long as the load of waste is not too great, the river can maintain its clean state. But if there is too much waste the river becomes polluted. People can no longer drink the water. They may not even be able to safely swim or go boating in it.

Greenhouse Gases

This is the way it is with the atmosphere. Carbon dioxide (CO_2) is constantly going into the atmosphere and out of it in the carbon cycle. The oceans and forests absorb CO_2. With industrialization, factories, cars, and power plants pump CO_2 into the atmosphere faster than it can be absorbed. The commons is being overwhelmed.

Think of the Earth's atmosphere as a tremendous bathtub. Imagine the concentration of greenhouse gases as the water in the bathtub. Water flows into the tub like CO_2 goes into the atmosphere. Like the water running down the drain, CO_2 is removed from the atmosphere. If the rate of flow from the faucet into the tub is equal to what is going down the drain, the water level remains the same. If you turn up the faucet, the level rises and the tub may overflow. Right now our atmospheric bathtub is filling twice as fast as it is draining.