Name _____ Date _____

A.P. Environmental Science Mr. Romano

Group # _____

Group Members _____

Tragedy of the Goldfish

Background:

The Tragedy of the Commons is an environmental concept that dates back to a 1968 paper written by Garrett Hardin. The Commons dates back even further, the term often used in Colonial times to denote certain lands held "in common" by everyone in a village upon which they could graze their livestock. Since the land belonged to no one and everyone, an individual could benefit in the short-term by putting too many animals on the land, thus resulting in overgrazing and deterioration of the resource. Unfortunately, human nature coupled with the long-held belief that the earth's resources are virtually inexhaustible has led to a world-wide deterioration of "common" resources, such as oceans, the air, wildlife populations, etc. Exacerbating this is the fact that humans frequently look to short-term benefits without a view of the long-term consequences.

Introduction:

In this simulation, you play the role of a fisherperson who makes his or her living harvesting commercially. The ocean represents one of the global commons that Hardin alludes to in his article. Your mission, if you choose to accept it (no you don't have a choice), is to harvest as many fish from the ocean commons to help keep your business afloat and your family cared for without destroying the ocean environment.

Procedure:

1. You will be part of a 4-member group of fisherpersons that will be harvesting fish from the ocean.
2. The goldfish are symbolic of just one of the resources that can be harvested from the ocean. In this simulation, the carrying capacity of the ocean is 16 fish. For the purposes of this simulation, at no time can the number of fish in the ocean exceed this number.
3. The group has 10 seconds to catch as many fish as desired. The amount you catch in each round (year) determines your annual income. You must catch at least one fish to help your family survive the year.
4. The straws are your fishing apparatus. To catch a fish, you aspirate through the straw. The medical definition of aspirate is: *to draw by suction from a vessel or cavity*. Yes you have just become human vacuums of goldfish crackers!
5. Each fish you catch is worth $20,000. If you weren't aware, that is a realistic price of what a good 500-lb Atlantic tuna goes for in the marketplace. The more fish you catch, the more money you make.
6. At the end of each session (year), new fish will be added for each remaining fish in the ocean.
7. A very special bonus will be given to the person in each group who has accumulated the most wealth at the end of the 4-year simulation.

Data:

Fisherperson										
Yield	*# Fish caught*	*Annual Income*	*# Fish caught*	*Annual Income*	*# Fish caught*	*Annual Income*	*# Fish caught*	*Annual Income*	**Total Fish Harvested**	**Total Income**
Year 1										
Year 2										
Year 3										
Year 4										
Totals										

Write-Up:

1. Abstract – purpose, procedure, data, conclusion, relate to Hardin's essay) (6 points)
2. Data Chart – complete, clear, correct calculations (6 points)
3. Participation – on-task, cooperative, followed written / verbal instructions, helped set-up / clean-up (3 points)

Post Lab Summary Discussion Questions:

Everyone in your group needs to be prepared to answer these … inability to do so results in a 1-point deduction from your group's lab. (need I remind you of the randomizer…)

1. Compare your results with 2 other groups (make sure to make mention of group #'s). Explain similarities and differences that you notice.

2. Do you think your group was effective in harvesting the fish without destroying the ocean? Why or why not?

3. Did your group discuss your actions and strategies before each harvest?
   If so, briefly relate you're the discussion. If there was no discussion, describe each group member's actions.

4. Why were you provided with different types of straws? What does this really represent in real life?
   Did the type of straw affect the harvest. Explain.

5. What is meant by exploitation of a resource? Why does common usage lead to exploitation?

6. Mathematically, what is the best strategy for harvest the fish to gain the most amount of money without degrading the ocean environment?