**Tragedy of the Commons – Student Materials**

**Scenario:**

Each person represents the head of a starving family which requires food (strong motivation to acquire food). The only food source for these four families is a small fishing hole which can accommodate 20 fish. Fortunately, after each round of fishing by the four family heads, each remaining fish is able to spontaneously reproduce and make one new fish (i.e. 4 fish become 8, to a maximum of 16). Each person is allowed to take as many or few fish as you want, but if you take only one fish, your family will starve.

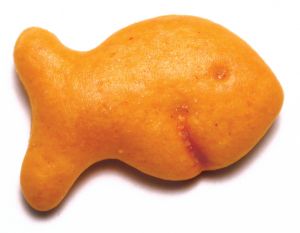
The object of the game is to harvest as many fish (goldfish) as possible from the sea (bowl/plate).

**Procedure**

*Part I ~ Harvest as many fish as you possibly can*

1. Divide yourselves into groups of four.
2. Our pond is a plate, and our fish are goldfish crackers. Fish are caught using plastic straws.
   1. When it is your turn, harvest as many fish as you can.
   2. For every fish each student harvests, he/she receives one point. More Fish = More Points.
   3. You may NOT touch the “pond” and you may NOT talk during Part I.
3. You will have an opportunity to fish for 30 seconds.
   1. You should rotate your fishing order every round so that everyone has a chance to go first.
4. At the end of every round, record the number of fish each person “caught” and the total number of fish remaining.
   1. Accurate records must be kept in an organized table, provided for you.
5. At the end of every round, the number of remaining goldfish will be doubled to simulate reproduction.
   1. The carrying capacity of the sea may not be exceeded (Your total in the sea may not be more than 16).
6. The simulation will continue for 5 rounds or until you run out of fish.

*Part II ~ Discuss and come up with a fishing strategy that will feed everyone equally without depleting resources.*



**Tragedy of the Commons Simulation**

**Data Section:**

*Data: Strategy #1: Get as many fish as possible.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Round | Fish at Start | # Fish caught by Person 1 | # Fish caught by Person 2 | # Fish caught by Person 3 | # Fish caught by Person 4 | # Fish caught by Person 5 | # Fish Remaining in Bowl |
| 1 |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |
| Totals: | ------- |  |  |  |  |  | ----------- |

*Data: Strategy #2: Feed everyone equally without depleting resources.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Round | Fish at Start | # Fish caught by Person 1 | # Fish caught by Person 2 | # Fish caught by Person 3 | # Fish caught by Person 4 | # Fish caught by Person 5 | # Fish Remaining in Bowl |
| 1 |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |
| Totals: | ------- |  |  |  |  |  | ----------- |

**Discussion ~ Tragedy of the Commons Lab**

Answer the following questions based on your data.

1. Why were fish only replaced if some remained in the pond after each trial?
2. What happens when the members of a group do not use a cooperative strategy (think of Part I)?
   1. Why does common usage lead to exploitation?
3. What is the best strategy for harvesting from this commons? Use data to support this.
4. Stewardship of a resource is demonstrated when we use a cooperative strategy that shows concern for a resource. List three other examples of resources that require human stewardship.
5. How do you think continued human population growth will affect our stewardship of the Earth’s resources?