



## APES- “Happy Fishing Game”

**Background Information:** In 1968, a scientist by the name of Dr. Garrett Harden coined the concept called the “*Tragedy of the Commons*”. “*The Tragedy of the Commons*” is a problem that occurs when a resource –such as the ocean, water, and air- is open to everyone. Overtime, these resources become *overexploited* and the consumers face the choice of restricting their own *consumption* for the good of the resource and community, or continuing to consume/use the resource opting to face dire consequences at a later time. When people are not compelled to preserve resources for the welfare of future generations, the *Tragedy of the Commons* occurs.

**Lab Objective:** Students will participate in an activity that will help them better understand the concept of the “*Tragedy of the Commons*” and the difficulties associated with managing these shared resources.

**Preparation:** Divide students into groups of 4 participants. Each group should sit around the "lake" (*common resource*). Fishing time – season lasts 4x20 seconds. Each student “fisherman” fishes once.

**Materials:**

- Goldfish- Colored
- Bowl (*Lake*)
- Straws (*at least 1 per student*)
- Plastic spoons (*at least 1 per student*)

**Scenario:** Each one of you represents the head of a family (*fisherman*) where the only source of income is to sell your daily fish catch. In order for your family to survive, you must catch enough fish to pay your *operating costs* and make profit to pay for your *living expenses*\*. The only food source is a small local lake, which can accommodate up to **16** fish. You must catch the fish by sucking up the "fish" from the lake with straws (*fishing pole*) or using a spoon to scoop up the fish (*net*). Each student will get a chance to fish once a year (*which lasts 20 seconds*) and each time you fish you may take as many fish as you wish. The second round you can decide how many fish you going to fish - 0, 1, 2, 3 or 4 fish from the lake. **“It is your choice of how many fish (0-4) you take, however, if you only take one fish, you will not make enough to support your family and pay for your fishing expenses.”** Each fish has a different “redemption value” based on color. After the annual fishing season has ended, any remaining fish will reproduce **once** during the off-season- each remaining fish is able to reproduce and make one new fish (*based on color- a maximum of 4 each- total of 16*). If you are unable to catch enough fish to support your fishing activity your game is over. **The student with the most “money” at the end will win a prize.**

### **Activity Procedures:**

1. Each student will start with **\$25** in ocean currency
2. Students are given the option of fishing gear:
  - a. **Fishing pole (straw)** – cost \$1 **one-time fee = ROUND 1**
  - b. **Fishing net (spoon)** – cost \$5 **annual fee = ROUND 2**
3. Students will get 20 seconds/each to fish. **Remember, you must catch enough to support your family and pay your annual expenses** (*at least \$20 per year*).
4. At the end of each year (*round*), the teacher will add an additional goldfish for each fish remaining in the lake. Make sure to add according to the colors remaining. **Each fish can replicate x 1 each** (*for a maximum of 16 in bowl*).
5. At the end of the first fishing season, fill in your worksheet. If you are unable to cover your annual expenses, you are unable to fish the next year. ***You have gone bankrupt and must sit out of the game.***
6. If your group still has fish remaining in the lake, continue to run another annual fishing season (***Year 2a***).
7. Repeat steps 2 – 5. *Again, if you are unable to cover your annual expenses, you are unable to fish the next year.*
8. Once the fish are exhausted - total up your worksheet.

### **Student Rules**

#### **9. NO TALKING DURING ACTIVITY**

10. Fisherman can only “fish” ***one fish at a time for the time of 20 seconds.***
11. No “*hitting*” or “*knocking*” other fisherman- will result in a fine (*see teacher for details*)
  12. Keep all catch fish in front of you- *for teacher to count after round*
  13. If you are out of fish or out of money- *you will have to sit out!*
  14. **There is a PRIZE for the player that has the most money at the end of the game!!**

## Happy Fishing Budget Sheet

Fisherman Name: \_\_\_\_\_

**Year 1- Operating Costs/Profits-**      Starting Amount- \$25      \$25

**Annual (once a year) Fishing Fees**      *Minus*

- Fishing Permit – \$5 per year      \$ \_\_\_\_\_
- Boat Maintenance/Fuel/Slip Fees- \$5 per year      \$ \_\_\_\_\_
- Cost of Living (Rent, Food, etc.) - \$10 per year      \$ \_\_\_\_\_

*Option- Choose which type of fishing equipment you will use*

- Fishing Pole (Straw)- \$1 initial fee (*no annual charges*)      \$ \_\_\_\_\_
- Large Fishing Nets (Spoon)- \$5 *annual fee*

**TOTAL Operating Costs (year one)**      \$\$ \_\_\_\_\_

*\* Need at LEAST \$20 worth of fish each year to survive*

### **Year 1- Fishing Profits**

- Goldfish- \$5 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_
- Pretzel - \$6 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_
- Redfish/Greenfish- \$8 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_
- Bluefish/Burgundy- \$12 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_

**Total Profits**      \$\$ \_\_\_\_\_

*Operating Costs (Subtract from profits)*      *Minus -*  
\$ \_\_\_\_\_

**Total (+-) for Year 1:**      \$ \_\_\_\_\_

*Question: Did you make a profit? Did you go bankrupt? Explain what happened.*

Fisherman Name: \_\_\_\_\_

**Year 2- Operating Costs/Profits-**      **Starting Amount ?**      \_\_\_\_\_

**Annual (once a year) Fishing Fees**      *Minus*

- Fishing Permit – \$5 per year      \$ \_\_\_\_\_
- Boat Maintenance/Fuel/Slip Fees- \$5 per year      \$ \_\_\_\_\_
- Cost of Living (Rent, Food, etc.) - \$10 per year      \$ \_\_\_\_\_

*You will need to pay another fee if you chose to use the nets*

- Large Fishing Nets (Spoon)- \$5 *annual fee*      \$ \_\_\_\_\_

**TOTAL Operating Costs (year one)**      \$\$ \_\_\_\_\_

*\* Need at LEAST \$20 worth of fish each year to survive*

**Year 2- Fishing Profits**

- Goldfish- \$5 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_
- Pretzel- \$6 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_
- Redfish/Greenfish- \$8 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_
- Bluefish/Burgundy- \$12 Each      x \_\_\_\_\_ =      \$ \_\_\_\_\_

**Total Profits**      \$\$ \_\_\_\_\_

*Operating Costs (Subtract from profits)*      *Minus -*  
\$ \_\_\_\_\_

**Total (+-) for Year 2:**      \$ \_\_\_\_\_

***Question: Did you make a profit? Did you go bankrupt? Explain what happened. Did you change your strategy for the 2<sup>nd</sup> round? How?***

Happy Fishing Lab- Tragedy of the Commons  
**DISCUSSION QUESTIONS**

1. Did anyone in your group take too many fish? How did that make you feel? Did everyone try to take as many as possible? Why or Why not? ***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. In Game two... **how** did your strategy change, if at all? ***Does it make a difference to know what the rewards are?***
4. Is it possible to maximize the number of fish caught/person **AND** the number of fish remaining in the pond **at the same time?** ***Why or Why not?***
5. Think of a **local commons** that you are familiar with. [*parking lots, bathrooms, bookstalls, etc.*] Do similar situations arise? **Explain. HOW might those problems be solved?**
6. What are some **natural resources** that are **common** resources?
7. What are the **global commons**? Are these being used wisely? ***Why or why not?***
8. ***What can people do to use these resources most wisely?***
9. Did a particular “type” of fish disappear faster than others? ***How does this relate to “economically valuable” species in nature and their extinction rates?***