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The Tragedy of the Commons Activity

Description of Activity

You will be divided into teams or "families" of about four students. You are part of a family living in a small, undeveloped, rural village near a fresh-water pond. This is a village in a developing nation – your home has no electricity or running water. The family consists of two parents and children. Your main source of food is the game and fish that you are able to catch in the village. The most popular source of food is the large commons area in the center of the village. A typical game and fish catch from this commons area is enough to feed your family for 3-4 days. The paper bag holds your families food source. Each bean represents one "catch", which can feed your family for 3-4 days. The number of beans hidden represents the carrying capacity of the village for this particular food resource. The carrying capacity is the maximum population size of a species that a given environment can sustain. There can never be more than this many beans at one time in the bag.

Part I: Free Use of Common Resources

- Each team gets one cup. This will be used to hold your "catch" so that other families cannot see how many pieces you take.
- You will choose one family member to do the hunting and fishing, but all family members can be in on decisions regarding how much should be taken.
- You may not discuss your family decisions with any other family in the village. After all, it is of no concern to them how much food your family needs to live well. Each family is allowed to take as small or large catch as they want to, but remember that one "catch" can feed your family for only 3-4 days and you will only have a chance to gather meat once per week.
- The instructor will bring around the bag of beans (which represent the food resources available). Take as much food as you want and place your "catch" in your cup without showing other groups.
- After all the families in the village hunt and fish for the week (one go-around), the instructor will determine how many resources are left and based on this number, the food sources will reproduce – after all, this is a renewable resource. After each round of hunting and fishing the remaining food sources spontaneously reproduce and make one new food source {example: 4 beans become 8 beans – but you can never exceed the carrying capacity (original number of beans)}.
- After the food source has reproduced, families will have the opportunity to gather food again, following the same rules outlined above. Repeat until the resources have been depleted.

Write Parts I - Conclusion Questions in your Lab Notebook!

Part I: Data Collection

Week #	# of Food Sources (beans) Taken
1	
2	
3	
4	
5	
6	

Part I: Questions

1. What was the fate of the common food resource during this part of the simulation?
2. Why do you think this happened?
3. What was your family strategy for food collection during this part of the simulation? Why?
4. How did your family's food collection strategy impact the fate of the resource?

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Part II: Common vs. Private Resources

- Same rules apply as Part I with one twist. You now have your own small pond on your own land that can support a small fish population. You now have two sources of food – the commons area and the private pond. No one can fish in your private pond unless you allow them to do so. Your private pond will be stocked with 4 "beans" – this represents the food resource that is present on your private land.
- After the families in the village hunt and fish for a week, the food sources will "reproduce" – this is a renewable resource. But keep in mind the concept of carrying capacity – in other words there is a limit to the number of animals that can live in this common area. Your private pond will also reproduce to its carrying capacity.

Part II: Data Collection

Week #	# of Food Sources (beans) Taken from Common Area	# of Food Sources (beans) Taken from Private Pond
1		
2		
3		
4		
5		
6		

Part II: Questions

5. What was the fate of the common resource in this part of the simulation? Was this the same fate as that of your private resource? Why were they the same or different?
6. What was your family strategy for resource collection during this part of the simulation? Why?
7. Do you think your family strategy for resource collection had any impact on the fate of the common resource? Explain.

Part III: Common and Private Resources with Possibility of Internal Regulation

- Same rules apply as in Part II with one twist: You may now talk about your resource collection strategies with the other families in your village. Your goal is to have a food resource available to the people in the village for as long as possible.

Part III: Data Collection

Week #	# of Food Sources (beans) Taken from Common Area	# of Food Sources (beans) Taken from Private Pond
1		
2		
3		
4		
5		
6		

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Part III: Questions

8. What was the fate of the common resource in this part of the simulation? Was this the same fate as that of your private resource? Why were they the same or different?
9. Summarize the discussions and decisions you were involved in when talking with the other families regarding resource collection.
10. What was your family strategy for resource collection during this part of the simulation? Why?

Conclusion Questions

11. Explain how use differs between publicly and privately owned resources.
12. Assuming the same resource availability, what would have changed if the population of your village had been cut in half? What if the population of your village were doubled?
13. What did Garrett Hardin mean when he said it was mathematically impossible to maximize population growth and goods per person? (See Summary Below)
14. Explain how the Tragedy of the Commons may apply to a commons pasture and the grazing of livestock. (See Summary Below)
15. What are some strategies that could be used to help prevent the Tragedy of the Commons?

Summary – The Tragedy of the Commons

In 1968, Garret Hardin published a paper entitled "The Tragedy of the Commons" in the journal Science, which looked at the ultimate failure of the relationship between people and their "commons" environment. He believed that resources that are open to unregulated exploitation will eventually be depleted. He explained that it was mathematically impossible to maximize both population growth and goods. As population was assumed to continue to grow, unchecked, the only predictable outcome was a minimization of goods per person.

Hardin used the example of a community pasture – or commons pasture – that was a feature of many 18^{th} and 19^{th} century English towns. This pasture was open to all of the town's herdsmen and provided the best grazing land for livestock. Each herdsman would, of course, keep as many cattle as he could possibly afford to own on the commons pasture. If the population remained low and stable, this would not prove problematic. However, as the town prospered and the population in the town grew the number of animals grazing the commons would grow as well. This is when the "tragedy of the commons" strikes.

Specifically it works like this: If a herdsman adds an additional animal to the commons pasture, that animal will create a certain amount of overgrazing. The herdsman gets all of the positive result of having the additional animal – more meat for sale – but the entire group of herdsman shares the negative results of the additional animal – each animal has its amount of food decreased. Obviously, the only rational choice for our herdsman is to add this animal – and probably to add as many animals as he can to the commons pasture. So what is the tragedy? It is that every other herdsman will be going through the same thought process. The herd will grow too fast and the pasture land will not be able to support the herd. The food resource will be ruined and the ultimate end will be that NO animals will be supported by the commons.

In other words, when each person chooses to maximize the resources they use (because they stand to GAIN significantly more than they will LOSE), ultimately all will lose due to the depletion of the resource.