In class we just performed a tragedy of the commons experiment. In the experiment you were split into four groups, or oil companies, each of which who owned a plot of land over the top of the same underground oil field with a fixed amount of oil in it. Each round, each company had the opportunity to choose to run their oil rig at low speed or high speed. A low speed rig produces 1 oil barrel per round. A high speed rig produces 2 barrels per round, but also wastes 1 barrel of oil in the process. These rounds continued until the well was out of oil (for the record, there were a total of 40 (I changed it before we started!) barrels of oil in the well). On a separate sheet of paper, or preferably in a Word document, answer the following questions as a group.

1. In the experiment, oil was a common pool resources. What does economic theory predict would happen? Write a couple of sentences here talking about specifically what theory predicts the companies would choose to do in each round and the consequences for society as a whole.

   Economic theory predicts that each oil company will choose to maximize their own oil production. As a result, they will rush to get oil out of the ground before it runs out. So each company will choose to run their rig at high speed in order to obtain more of the oil for themselves while wasting some oil in the process.

2. What would the socially optimal course of action be for each of the oil companies in the experiment? Explain.

   The socially optimal course of action would be for each oil company to run their rig at low speed. This would eliminate waste and result in the maximum amount of oil to be extracted, which would be better for each of the companies as well as better for consumers who want oil products like gasoline and plastic.

3. Compare what actually happen in the experiment to what theory predicted as well as the socially optimal actions. Were you guys close to the social optimum? Close to the theoretical prediction?

   The socially optimal amount of oil extracted is 40 barrels while the class extract 24 barrels. The theoretical prediction is 20 barrels, so the class did a little better than theory predicted but were still much closer to theory than they were to the optimum.

4. In this experimental setting, come up with at least one method for changing incentives in order to obtain the socially optimal outcome and explain why you think it would work. (Note: If you have several ideas, tell me about all of them!)

   One idea both groups had was to somehow make oil production transparent and allow the oil companies to communicate. This would probably work in the experiment because of social pressure – everyone knows everyone in the classroom, so if someone defects and runs their rig at “high” for a round, everyone will know it and their reputation will take a hit because of it. In real life, however, this will be hard to pull off. Production documents can be faked and inspections are expensive. One idea nobody had during class (including me!) was a merger. This could be an actual merger, where the four companies become one, or a just a profit sharing scheme by running the 4 rigs as a joint project between the companies. If the profits from the oil rigs are shared equally among the four companies, suddenly the incentives completely flip – now it’s much more beneficial for the oil companies to pull the oil out of the ground slowly and efficiently rather than quickly and wastefully.