

# Tragedy of the Commons: M&Ms

## Materials

1. Large (gallon or quart-sized), clear zip-lock bag filled with M&Ms or other small candies
2. Count and record number of candies ahead of time.
3. Visual 1

## Procedures

1. Display the (pre-counted) bag of M&Ms where it's clearly visible to all students.
2. Explain the rules:
  - a. No talking; you may not consult with other people.
  - b. "Claim" any number of M&Ms by writing the number and your initials on a scrap of paper.
  - c. I will collect all the claims and you will receive the number of M&Ms you claimed if the total claimed does not exceed the total number of M&Ms in the bag.
  - d. Also, if the claims do NOT exceed the # in the bag, the following prizes will be awarded:
    - i. 20 extra credit points for the largest claim
    - ii. 15 extra credit points for the 2<sup>nd</sup> largest claim
    - iii. 10 extra credit points for the 3<sup>rd</sup> largest claim
3. Debriefing Questions:
  - a. What was your thinking in making your "claim"?
  - b. Anticipate a variety of answers:
    - i. There may be students who don't like M&Ms and claimed none, but the more common approach, (and the explanation for the smaller claims) is guessing the total number of M&Ms and dividing it by the number of people in the room. Note that these people have essentially given up on the prize and are often more interested in what they perceive to be "fair."
    - ii. Those intent on the prize will also voice that they considered the total number in the bag and what they thought others likely to do.
  - c. Why did the total claim exceed the total number of M&Ms?
  - d. How did the rules of the game encourage this outcome?
    - i. The total claim exceeded the number of M&Ms because the rules of the game encouraged people to think only of immediate benefit, which

- could be gained only by the three players with the largest claims and provided no benefit – and therefore no incentive - to those who made small claims.
- ii. Additionally, the rules thwarted those who would arrive at some “fair” or “equal” distribution by keeping the number of M&Ms unknown, and by prohibiting communication among the players that might have encouraged cooperation.
  - e. Who owned the bag of M&Ms?
    - i. The property rights are unclear, although the rules of the game suggest that it is a commons (or that the teacher who purchased the bag has made it a commons), since no one is excluded from making a claim and no one can constrain anyone else’s claim.
  - f. How could you establish ownership of M&Ms?
    - i. By making a claim. (rule of capture)

## Connections

Suppose the M&Ms in the bag are fish in an ocean fishery. The decline of fisheries world-wide is a significant problem. Use the following questions to help students use their experience in the M&Ms game to understanding the tragedy of the commons in ocean fisheries.

1. Who owns the ocean fishery?
  - a. Ownership is unclear. Even within the 200 miles territorial water, ownership rests with “the people” or “the country” in common.
2. How does a fisherman establish ownership (property right) to fish?
  - a. by capturing them
3. Suppose the fishermen know that the fish stock is declining and the fishery will collapse. How will they change their behavior?
  - a. As long as the fishery is a commons, they will not change their behavior. If a single fisher cuts back on his catch in order to conserve, he can’t prevent other fishers from increasing their catch.
  - b. There is no benefit in conserving – even knowing that continuing to harvest as many as possible will cause the fishery to collapse.
4. What is the cost to each fisherman of conserving?
  - a. Income he could have had from catching the additional fish.
5. Who benefits from a fisherman reducing his catch in order to conserve?
  - a. The other fishermen who aren’t conserving and who now can catch more fish.
6. How could we change the rules of the game to provide incentives for

conservation?

- a. By assigning property rights to the fishery so that individual producers have an incentive to preserve a sustainable fish population.
- b. IFQs, or Individual Fish Quotas, assign each fisherman in the fishery a % of what biologists determine to be the sustainable catch level for that year. Importantly, the IFQs are the fishers' property and can be bought, sold, or leased. The market for IFQs means that they migrate to their most highly valued uses – that is, to the fishers who are able to harvest the fish at least cost.

## Closure

1. Display Visual 1.
2. Discuss each situation noted there as an example of the tragedy of the commons.
3. Each example involves a case where the thing in question is not individually owned. Stress the idea that when a resource is not owned, nobody has a clear incentive to protect it.
4. Explain that the antidote to the tragedy of the commons is to provide clearly defined (know who owns it), enforceable (owned property protected by law), and transferable (profits from the resource, or the resource, itself, can be bought and sold) property rights.
5. There are many ways to define property rights in circumstances in which property ownership is not obvious.
  - a. First, a government can assume ownership and thus restrict use—as in admission to national parks.
  - b. Second, government can assume a monitoring role, as it does with air and water pollution or fishing.
  - c. Third, private ownership can be assigned. A private owner will profit from the resource and thus have an incentive to protect it.
6. Review the key points of the lesson. Ask:
  - a. What is the tragedy of the commons? (Resources owned in common tend to be overused.)
  - b. How would a specification of ownership of the M&Ms in class have made a difference in who got what and how much? (If the teacher had owned the M&Ms, then the teacher might have monitored the students when they took them, ensuring everyone got some. If a student(s) had owned the M&Ms, the outcome might have been the same. Or student(s) might have sold M&Ms to other students. Either way, the

quantity taken by each student would have been monitored.

- c. Explain why the hallways in schools tend to be littered at the end of the school day. (No one seems to own the hallways. Students are tempted to treat them as long wastebaskets.)

## **Visual 1**

### **TRAGEDY OF THE COMMONS**

In each of the following situations, discuss ownership of the resource in question.  
Who owns it?

Nobody? Everybody? What difference does it make?

Parking space near a discount department store

Hotel rooms

Shopping carts at a grocery store

The school cafeteria

Public restrooms

Vacant city lots

Public parks

Bottoms of public lakes and rivers

Tuna fish in the oceans

Air surrounding big cities

Air around hog farms or cattle feedlots

Whales in the oceans