Go Fish!   Group Members names:

Imagine that you are asked to determine the number of fish in a nearby pond. To count the fish one by one, you could remove the fish from the pond and stack them to one side, or mark each fish so you would not count them over and over again. Counting like this could be hazardous to a fish's health!

To determine the number of animals in a population, scientists often use the capture-recapture method. A number of animals are captured, carefully tagged, and returned to their native habitat. Then a second group of animals is captured and counted, and the number of tagged animals is noted. Scientists then use proportions to estimate the number in the entire population.

Each group needs:
• 1 paper lunch sack to represent the lake
• A supply of goldfish crackers to represent the fish in the lake
• A supply of colored goldfish crackers to represent the tagged fish
• 1 cup to represent the "net"
• 1 paper plate

Part A: Collect the Data
Capture:
1. Each group receives a lake with fish inside.
2. With the net, scoop a sample of fish out of your lake onto the paper plate.
3. Replace your sample of fish with tagged fish.
4. Count the number of tagged fish and then return them to the bag.
5. There are _____ tagged fish in the entire lake.

Recapture:
6. Shake the bag gently.
7. Use your net to remove a sample of fish. Count the number of tagged fish and total fish in your sample and record the data in the first column below.
8. Return all of these fish to the lake and shake gently to mix them up.
9. Repeat this process until you have gathered data on 10 samples and filled in the table below.

Sample number	Number of tagged fish	Total number of fish
1		
2		
3		
4		
5		
6		
7		

8		
9		
10		
Average		

Part B: Analyze the Data

1. Find the average number of tagged fish and the average number of total fish in your samples. (Using the average number with 10 samples is more reliable than using any one sample's data.)

2. Use the proportion below to estimate the total number of fish in your lake:

$$\frac{\text{average number of tagged fish in sample}}{\text{average number of fish in sample}} = \frac{\text{number of tagged fish in pond}}{\text{number of fish in pond}}$$

Estimated population:

3. Now count the total number of fish in your lake to determine how close your estimate from the "sampling" is to the actual number of fish in the lake.

Actual population:

4. How close were you to the actual number of fish?

Part C: Extension

1. Where else would scientists use this capture/recapture method?

2. What are some of the factors that could have caused an estimate to be close or not so close to the actual number of fish?