

## MIDDLE SCHOOL CORNER (6-8)

### FISH IN THE OCEAN

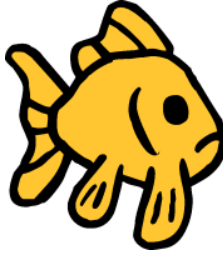
by Mark Ellis, Seattle School District

**GLE/EALR:** 1.1.4 — Understand the concept of direct proportion

**Grade Level:** 7

**Class Time to Complete:** 2 days

**Materials Needed For One Class:**



Item	Quantity
Large Clean Tub	1
Large Boxes Cheddar Fish	2
Small Bags of Pretzel Fish	8
Copy of Worksheets	Enough for each student
3 oz. Paper Cups	Double number of students

**Day 1** Empty the large boxes of cheddar fish into the tub. Count out the cups. Have the small bags of pretzel fish ready to go.

*Step 1:* Read the worksheet with students.

*Step 2:* Show them the large tub of fish and have them make an estimate of how many fish are in the ocean.

*Step 3:* Talk about how scientists sample and tag fish in real life.

*Step 4:* Have each student take a sample of fish. I recommend that the teacher do the dipping.

*Step 5:* Follow rest of instructions in student worksheets.

**Day 2** Go over the problem briefly.

*Step 1:* Every student gets a sample. Teacher should do the dipping.

*Step 2:* Follow the instructions, making sure that each student is able to set up the problem and get a number for their sample. You should see a large variation in number of fish in the ocean from individual answers. Ask students why we see such a larger variation.

*Step 3:* Find the group's number of fish in the ocean. The range should narrow. Ask the students, "Why does the range get smaller when we do it as a group?"

*Step 4:* Find the class' number of fish in the ocean. This is the final number. Ask how this compares to all the other numbers.

*Step 5:* Have the students write their comparison up as a short one to three paragraph explanation (below).

**Ending Comparison** Name \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_ Write down your original estimate for the number of fish.

\_\_\_\_\_ How many fish are in the ocean using your sample numbers?

\_\_\_\_\_ How many fish are in the ocean using your group's numbers?

\_\_\_\_\_ How many fish are in the ocean using the class' numbers?

Compare your three answers, why are they different? Explain why you think they are different.

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

There are many fish in the ocean. Scientists often count fish to make sure there are enough to harvest. We will be simulating a method that scientists use to count fish.

We will do an experiment involving sampling. Sampling is a method, which allows scientists to count a lot of fish, yet only have to count a small portion of the total.

Our ocean is full of cheddar fish. Our goal is to estimate how many cheddar fish are in our ocean. We will be doing this by: catching fish, tagging fish and releasing them back to the ocean to swim around, and re-catching a sample to see what proportion is tagged.

Day 1: \_\_\_\_\_

1. Each person will net one cup worth of fish. These fish must be counted. **Do not eat the fish.** How many fish did you count? \_\_\_\_\_
2. Count the same number of pretzel fish out that you counted in the first step. These fish will represent your tagged fish. **Do not eat the fish.**
3. Put your **tagged** fish back in the ocean with the untagged fish.
4. You may eat the fish.



Day 2: \_\_\_\_\_

1. Each person takes a sample with their cup after all the tagged fish are mixed in. **Do not eat the fish.**
2. Each person will count the number of tagged fish and the number of untagged fish (cheddar fish). **Do not eat the fish.**  
Number of tagged fish \_\_\_\_\_ Total number of fish in the sample \_\_\_\_\_
3. You may eat the fish.
4. The group will record the total tagged fish and total fish sampled for the group. Record this figure on the chart (overhead). Each person will need a copy of the chart.
5. Set up a proportion to figure out how many fish are in the ocean.
6. Figure out how many fish are in the ocean using your numbers, your group's numbers and the class numbers.
7. Compare each answer and why or why not they are different on a separate sheet of paper.

Group	Tagged Fish in the Ocean	Tagged Fish in the Sample	Total in the Sample	Group Estimate
1				
2				
3				
4				
5				
6				
7				
8				
<b>Class as Whole</b>				