



**Science Unit:** *Resource Extraction and the Environment*  
**Lesson 5:** *Obtaining Food – The Impact of Over-fishing*

School year: 2008/2009  
Developed for: Trafalgar Elementary School, Vancouver School District  
Developed by: Luana Avila (scientist), Nana Hashimoto and Rowshanak Vessali (teachers)  
Grade level: Presented to grades 4 - 5; appropriate for grades 2 – 5 with age appropriate modifications.  
Duration of lesson: 1 hour and 20 minutes

**Objectives**

**Objectives**

1. Learn the importance of sustainable fishing
2. Learn the concept of collaboration in maintaining our food supply

**Background Information**

It is easy to forget that food is also a resource that we need to extract from the Earth. As omnivores, we eat pretty much anything: fungi, plants and animals! Our ability to obtain food is the most important step in allowing our population to grow. As a society we developed hunting, fishing, gathering and farming as ways to obtain food; however, all these activities have an impact on the environment. If we fish, hunt or gather too much we deplete other populations and create an imbalance in other food chains. For example, if we catch too many salmon, few will return to spawn and their numbers will be reduced. Penguins and Elephant seals also feed on salmon. Due to a reduced food supply, these 2 populations will reduce in size. Catching, hunting or taking too much, too fast will often have a 'domino effect' due to the fact that all living organisms are linked by food chains.

In this lesson, we will discuss the effect of over-fishing and extrapolate our findings to other food extraction systems.

**Vocabulary**

<u>Word:</u>	<u>Brief definition.</u>
Over-fishing	When humans remove more fish than can be naturally replenished by breeding
Sustainable	Capable of being continued with minimal long-term effect on the environment

**Materials:**

- Fish crackers
- Large bowl
- 1 spoon / student

Optional:

- Small doormat (something soft)



## **In the Classroom**

### **Introductory Discussion**

Today we will look at a must-have resource – FOOD!

Draw on the board 3 boats and 5 fish

Right now - Each boat takes one fish, 2 are left. These 2 went off and reproduced, making one other fish

Next year – Each boat came back and each took one fish. How many are left for next year? (none!)

This happens every year in our rivers and oceans. Different types of fish can have their population reduced to the point of extinction.

### **What could we do?**

Brainstorm and write suggestions on the board

- Reduce the number of fish we catch
- Regulate fishing
- Eat other foods

Now imagine we live on a sandy island, where vegetable don't really grow. Our only source of food is from the ocean. We can go on our raft (if you have a doormat use it as a 'raft' they get to share) and get fish!

Today we are going to use fish crackers as our fishy food source, the bowl is our ocean, this doormat is our raft and we are the fisherman.

REMIND STUDENTS:

We have an entire ocean of food in front of us but we are sharing! If we eat more than the ocean can replenish we are going to run out of food!

### **Activity #1: To fish or Not to fish?**

Students will learn the importance of regulated fishing and collaborative effort in maintaining the food supply for a community

Arrange class in a large circle on the carpet (or floor) and place a large bowl filled with 2 times as many fish crackers as there are students in the centre of the circle. If you have a doormat, place the raft inside the circle, in front of the first fisherman. Once he or she is finished 'fishing' they pass the doormat to the person next to them.

Instruct students to:

1. Use spoon to get the fish from the bowl
2. Dump fish on their hand and then eat the fish crackers as soon as they take them
3. Each student is allowed to take 0, 1 or 2 fish.
4. We will go around the circle and at the end we will count the number of fish left in the bowl and add  $\frac{1}{2}$  as many. We will go around the circle 5 times.
  - a. If we run out of fish...we all lose! (as we will starve)



## SCIENTIST IN RESIDENCE PROGRAM

- b. If anyone does not take at least 1 fish in 2 rounds...he/she is 'out' (as he/she starved!)
5. The goal of the game is to remain alive!

NOTE: Students will usually overfish. If they do, start a new round and emphasize that the way they fished in the previous game was not good, as they depleted the fish pool and everyone starved. Before starting a new game, ask them to come up with solutions for their over-fishing and a new fishing strategy.

### **Closure**

1. Discuss the outcome of the game
2. How important is it to prevent over-fishing our rivers and oceans?
3. What are some ways we can prevent depleting our food supply?
4. What does our extraction of food affect other food chains?

### **Activity #2 - Present biome dioramas**

If you have been following this unit, by now the students should have completed their biome dioramas. Each group will present their biome and as they present the teacher should ask the class to identify resources could be extracted from that biome (Forests: rich in wood, Tundra: rich in minerals, Grasslands: rich in farming land, etc...)

Overtime, each group should modify their 'pristine' biome to include the damage that resource extraction would create.

### **Extension of Lesson Plan**

1. Play the same game using parallel food chains. (ie. circle of humans eating fish AND circle of fish eating krill AND circle of krill eating algae)