

Introduction

In the United States almost 30% of our protein comes from beef, but Americans also get a large portion (15%) from fish. Therefore, catching fish is important in filling the protein needs of Americans. As a result, to obtain fish for our dinner plates, fishermen collect upwards of 2 billion pounds of bycatch annually.



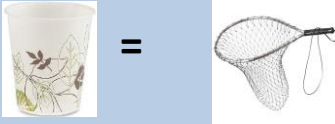
New Terms

Target Species = Species fishermen seek to catch

Non-target Species = Unwanted species found in the same waters as target fish

Bycatch = Non-target species found in the fishing gear

Need Volunteer to Go Fishing Paper Cup = Net to Catch Target Fish



P 73 Table 1: Net Statistics: Target vs Bycatch

	# of each species			% of each species	
	target species	non-target species	Total in catch	target species	non-target species
Original Net				*	**

* # Target/total # in catch X 100 ** # Non-Target/total # in catch X 100

What is Bycatch? WWF Video (Questions 1-4)

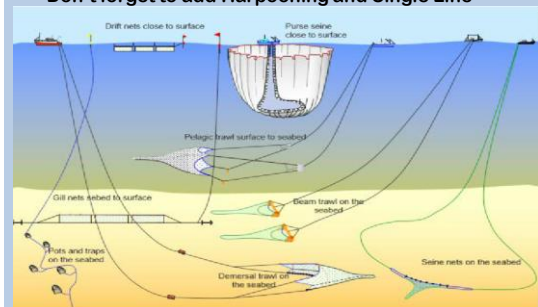


Video WWF

- 1. Explain sustainable fishing in your own words.**
Sustainable fishing guarantees there will be fish for the future.
- 2. What is bycatch?**
Non-target fish species found in fishing gear
- 3. What is overfishing?**
Taking too many fish of the same species before they reproduce
- 4. Why is this (overfishing) a problem?**
Reduces fish populations affecting the ocean ecosystems; reduces future food for humans

Types of Fishing Methods

Review the 8 types of fishing methods on page 76. Quickly answer questions 1-3. *Don't forget to add Harpooning and Single Line



P 73 Questions: Types of Fishing Nets

1. Which type of net results in a lot of bycatch?
Purse seining and longlining
2. Which type of net results in low levels of by catch?
Harpooning; single line
3. What are the advantages and disadvantages of each type for the fisherman and the environment?
Disadvantages: *over fishing, taking in bycatch; safer methods take in small numbers*
Advantages: *Quicker, get large numbers of fish; safer methods protect sustainability*

Can I design a net to reduce the amount of bycatch?



Your Objective

Today you are going to create a net that is designed to catch only Tuna (*target species*) and no other type of sea creatures. You will have a choice of SIX materials. You will have TWO attempts at fishing with your new net to be completed by the end of class. You will work in groups of THREE.



P 73 Questions: Designing a Net

1. What problem are you trying to solve?
Designing a net that reduces the amount of bycatch
2. What are your **criteria** for a successful design? (design features)
Does net design reduce the amount of bycatch from the original net; Durable to repeat test twice
3. How will you **measure** success? Does it work?
By comparing the percentage of target catch vs. bycatch.
4. What are the **constraints** (materials and resources) on your design solution?
6 materials, size of original net, test 2 times; groups of 3; time in class

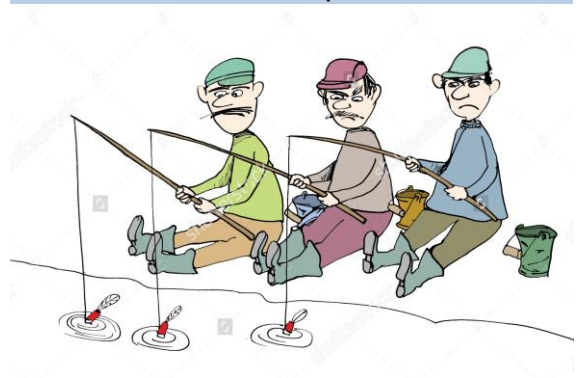
What claim are you making?

I claim the modified net design will reduce bycatch compared to the original net because ...

How will you know if your claim is correct?

By comparing the percentage of target catch vs. bycatch.

Get into Groups of 3



Walk to See the Fishing Net Supply Materials



Proposed Net Design

- Copy original data from P 73 to P 74 Table 2.
- Design and draw your OWN, INDIVIDUAL net (Page 74; left box)
- After a group discussion, settle on one design or combine features for your final design which will be tested. (Page 74; left box)
- When your net is made, come up to the ocean and fish. Record your catch in Table 2 group Design Trial 1 on page 74.
- Return your fish to the sea

Group Design Trial 2

- Make any alterations to your net (only 6 pieces of material)
- When your net is fixed come up to the ocean and fish. Record your catch in Table 2 Group Design Trial 2 on page 74.
- YOU ONLY GET 2 TRIALS SO MAKE SMART ALTERATIONS
- Return your fish to the sea

Bycatch Reasoning Homework

Part 1: Restate Claim:

I claim that the modified net design compared to the original net..... because.....

Part 2: Evidence:

In complete sentences, link the evidence from Table 2 to your claim.

Scientific Principle:

From background information, the article you read, and any previous notes (page 61 and 67) explain the science behind this activity.