

Science Time

Program Content for Part 2 and 3.

Read parts 2 and 3 of the NOAA special section entitled Sustainable U.S Seafood: What's science got to do with it?" Please remember to always preview the content before using in your classroom.

Part 2

Pre-reading Vocabulary: Define each term and use it in a sentence

1. Estimate
2. Continental shelf
3. Biased

Comprehension Questions

1. Where do walleye pollock live?
2. How do scientists figure out how many pollock are in the ocean?
3. What two benefits does estimating fish population size offer over sampling the entire ocean?
4. What is random sampling?
5. Identify and explain each of the two types of surveys used to estimate pollock population size.
6. Complete the 'Let's do science!' section.

Prompts and Extensions

1. Which of the challenges faced by scientists when counting pollock do you think is the most difficult to overcome? Explain your reasoning.
2. Find out more about walleye pollock. Report on the following aspects of this fish. Size, habitat, life cycle, diet, unique features, overall health of the population, human impact.
3. Dissect a fish or do a virtual dissection of a salmon here
<http://library.thinkquest.org/05aug/00548/DissectionGame.html>.
4. See the activities listed in the bottom right corner of part 2 for more enrichment opportunities.

Part 3

Pre-reading Vocabulary: Define each term and use it in a sentence

1. Harvest
2. Spawn
3. Sustainable

Comprehension Questions

1. What is a catch limit?
2. What are the three parts of a fish population's age structure?
3. Why is fish age important for sustainable seafood?
4. Where are otoliths?
5. What is the function of otoliths?
6. Why are otoliths good for aging a fish?
7. Complete the 'Let's do science!' section.

Prompts and Extensions:

1. See the activities listed in the bottom right corner of part 3 for enrichment opportunities.

Science Time

Program Content for November 28, 2012

ANSWERS

Part 2: Comprehension Questions

1. Where do walleye pollock live? **The Bering Sea near Alaska.**
2. How do scientists figure out how many pollock are in the ocean? **They estimate population size from samples.**
3. What two benefits does estimating fish population size offer over sampling the entire ocean? **Estimating is less expensive and takes less time.**
4. What is random sampling? **A method of counting population size from areas with and without fish.**
5. Identify and explain each of the two types of surveys used to estimate pollock population size. **Bottom-trawl surveying drags a large net along the seafloor to catch fish; Hydroacoustic surveys uses sound waves to count pollock in the water column.**
6. Complete the 'Let's do science!' section. **Area 1: mean - 2, total fish 50; Area 2: mean - 3, total fish - 75; Area 3: mean - 2, total fish - 50. Our estimates may be different in each area due to varying distributions. Once fish population distribution are known we could sample more often in grids near higher concentrations of fish and less often in grids known to be without fish.**

Part 3: Comprehension Questions

1. What is a catch limit? **The number of fish that fisherman can harvest in a year/season.**
2. What are the three parts of a fish population's age structure? **1. Knowing how old fish can get, 2. How many individual fish in the population are at each age, 3. The age of a fish when it first spawns**
3. Why is fish age important for sustainable seafood? **Knowing the age of a fish population can help prevent overharvesting by not allowing fish to be caught when they are too old or too young; not knowing fish age could result in a decreased size of future populations.**
4. Where are otoliths? **Hard, calcified structures located in the ear of a fish.**
5. What is the function of otoliths? **They help fish detect sounds and balance while swimming**
6. Why are otoliths good for aging a fish? **Because new layers are added almost every year throughout the life of a fish similar to the rings in a tree trunk.**
7. Complete the 'Let's do science!' section.
 - a. **Boat 3**
 - b. **The population as a whole will be younger and produce less offspring because older fish create more offspring than younger fish. This could eventually lead to a decrease in the fish population.**
 - c. **Boat 2**
 - d. **The population as a whole will be older and may result in an overall decrease in the**

population because younger fish are not available to replace older fish when they die.

e. Boat 1

- i. This could be a more sustainable method of fishing because older, more fertile fish are still available to sustain the population and younger fish are also protected to replace older fish when they die.**