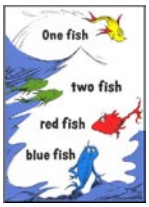

ONE FISH, TWO FISH, RED FISH, BLUE FISH

FISHING ACTIVITY:

ALLOTTED TIME: ½ hour- 45 minutes

SUGGESTED GRADE LEVEL: 3 and up

NUMBER OF STUDENTS NEEDED: up to 20

OBJECTIVES:

1. To facilitate discussion and understanding among children about PCB contamination in fish in the New Bedford Harbor.
2. To teach students that fish (lobster, shellfish) taken from NBH are not safe to eat because the harbor is contaminated, but fish outside the harbor (ie commercially caught fish) are safe to eat. You can not tell if fish are contaminated just by looking at them. It's where they're caught!

ADDITIONAL CONCEPTS:

1. Fish (inc. Lobster, shellfish) in New Bedford Harbor are contaminated with PCBs.
2. How fish became contaminated (New Bedford industrial history).
3. Do not eat fish in New Bedford Harbor.
4. PCBs in fish can make you sick over time if you eat them (bio-accumulation).
5. Fish caught outside of the harbor (Buzzards Bay) are okay to eat.
6. Know where a fish is caught before you eat it.

MATERIALS:

1. Two plastic bins or lasagna pans: One bin represents Buzzards Bay, one represents New Bedford Harbor
2. Plastic spoons (Rods)
3. Plastic cups (Nets)
4. Red, green, blue multi-colored goldfish crackers
5. Large box of white rice
6. 2 pails (plastic containers are fine)

PROCEDURE:

1. Label bins and pails "New Bedford Harbor" and "Buzzards Bay".
2. Fills bins with white rice.
3. Add multi-color goldfish to New Bedford bin and mix fish with rice.
4. Add multi colored gold fish to Buzzards Bay bin and mix fish with rice.
5. Before the activity begins, give kids an overview of PCBs, the PCB problem, and PCB contaminated fish in the harbor. Explain how the fish got contaminated, along with potential health problems that could occur if one eats contaminated fish. It should also be explained that commercial fish caught outside of the harbor (Buzzards Bay) are not contaminated and are okay to eat.
6. Give kids their "fishing gear" (rods [spoons], cups [nets] and pails). Instruct children to put any fish they "catch" into a pail.
7. Give kids 3-5 minutes to fish. Ask them to put the rods and nets down after a few minutes.
8. Pour out "catch" into separate piles.

9. Have kids examine their catch and ask them about the fish they caught (below).

POTENTIAL DISCUSSION QUESTIONS:

- Where did you catch the fish?
- Can you tell difference between contaminated and non contaminated fish by looking at it?
- Are the fish okay to eat? Why?
- What happens if someone eats a lot of contaminated fish over time?
- What does “bio accumulation” mean?
- What should one do when one catches a contaminated fish?
- Is it still okay to fish in New Bedford Harbor?
- Is it okay to catch and eat fish from Buzzards Bay?

OPTIONAL INCENTIVE: Kids who answer thoughtfully get a prize (gold) goldfish

One Fish, Two Fish, Red Fish, Blue Fish

Connections to the Massachusetts Science and Technology/Engineering Curriculum Framework May 2001

Guiding Principal V: Investigation, experimentation, and problem solving are central to science and technology/engineering education.

Investigations introduce students to the nature of original research, increase students' understanding of scientific and technological concepts, promote skill development, and provide entry points for all learners.

Guiding Principal VI: Students learn best in an environment that conveys high academic expectations for all students.

School districts should also invite role models from business and the community (including professional engineers and scientists to visit classes, work with students, and contribute to instruction.

Guiding Principal X: Implementation of an effective science and technology/engineering program requires collaboration with experts, appropriate materials, support from parents and community, ongoing professional development and quantitative and qualitative assessment.

In addition, local members of the science and engineering community may be able to lend their own expertise to assist with the implementation of a new curriculum. Teachers and administrators should invite scientists, engineers, higher education faculty, and representatives of local businesses and museum personnel to help evaluate the planned curriculum and enrich it with community connections.

Strand 2: Life Science (Biology)

Grades 3 - 5

Topic	Learning Standard	Example
Characteristics of plants and animals	1. Classify plants and animals according to the physical characteristics that they share.	Through the introduction and background information, students should be introduced to the organisms (fish, shellfish and crustaceans) that are contaminated in New Bedford harbor and their physical and ecological characteristics.
Adaptations of living things	7. Give examples of how changes in the environment have caused some plants and animals to die or move to new locations.	Students should understand how human actions and pollution have caused some organisms to die off and others to become contaminated in New Bedford Harbor.
	10. Give examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.	Students discover what methods are being used to help clean-up New Bedford Harbor and protect the fish, shellfish and crustaceans.
Energy and living things	11. Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers to consumers to decomposers.	Students will discover how fish, shellfish and lobsters became contaminated with PCBs and how this pollutant bioaccumulates within the food chain.

Strand 2: Life Science (Biology)

Grades 6-8

Topic	Learning Standard	Example
Changes in ecosystems over time	17. Identify ways in which ecosystems have changed throughout geologic time in response to physical conditions, interactions among organisms and the actions of humans.	Through the interactive story, students discover how humans have polluted harbors and water systems throughout history and learn about this effect on the organisms that inhabit the ecosystem.