

## Catch of the Day

### OBJECTIVES

Students conduct experiments that simulate fishing techniques and explore processes that result in bycatch.



Each year, thousands of sharks are snagged in nets set out to catch other types of fish.

### MATERIALS

- leaf rake
- four 10" wooden dowels (or use craft sticks, large pencils, or rulers)
- 2' of string or yarn, cut into four 6" lengths
- small craft or similar magnets (magnetic tape will not work well)
- about 75 large-size paper clips
- about 35 2" squares of white construction paper\*
- about 35 2" squares of blue construction paper\*
- about 35 2" squares of red construction paper\*

\* *or—if possible—use small, fish-shaped pieces of construction paper.*

### BACKGROUND

Fishing nets like purse seines and driftnets make it easy to catch lots of fish. But they've also introduced new problems: the nets catch everything that can't swim through the mesh, regardless of species. When the nets are hauled in, fishers try to toss back non-target species (the bycatch), but most of these animals die anyway. According to the Center for Marine Conservation, the number of sharks killed incidentally in fishing operations equals or exceeds those taken intentionally.

For this activity, students work in small learning groups to see how two different fishing methods result in bycatch. (*Note: this activity can be done indoors or outdoors.*)



### ACTION

1. Prepare materials before class:
  - Use pieces of construction paper to simulate three different species of sharks. Attach a large paper clip to each red and white "shark." Do not attach paper clips to blue "sharks."
  - To simulate fishing poles, tie one end of a 6" string to a dowel (*or ruler, stick, or pencil*). Tie a paper clip on the other end of the string, and place a magnet on the paper clip.

2. Discuss how people use sharks for food and other materials. Sharks (and other fishes) can be caught in a variety of ways, including hook-and-line, longline (one long fishing line with hundreds of hooks), and nets. Also discuss bycatch. Ask students to predict which fishing method results in a larger catch and which results in the most bycatch.
3. Divide your class into groups of five students. Work with one group at a time. In each group, four students fish for sharks with fishing poles, and the fifth student is the boat captain.
4. With the first group of students, distribute “fishing poles” to the four pole fishers and demonstrate how to use them: Students will “hook” a shark with the magnet on their fishing line. (The magnet attracts a paper clip.) The boat captain’s job is to assist the pole fishers by removing the shark from their line and by counting the day’s catch.
5. Explain to students that their goal is to catch as many red sharks as possible. Blue papers and white papers represent two species of sharks that share habitat with the red sharks. If caught, they represent bycatch.
6. Create a playing field that represents the ocean. Scatter all three colors of paper squares over the playing field.
7. Time the group for one minute. Students catch as many red sharks as they can. The boat captain should record the catch.
8. Next the group will try net fishing. To simulate a net that scoops in a lot of animals at once, they will use a leaf rake to scoop sharks. Again, scatter all three colors of paper squares over the playing field. The boat captain gets one chance to run the rake across the playing field to catch as many red sharks as possible. This time the other fishers on the boat sort and count the day’s catch.
9. Discuss this experiment with your students:
  - Which fishing method resulted in the highest red shark catch? Which method resulted in more bycatch?
  - What are the advantages of each fishing method? What are the disadvantages?
  - Which method might work well for schooling fishes? Which method might work best for a species that doesn’t school?
10. Repeat this experiment with the following variations, and ask students how these situations affect their fishing operation.
  - Blue sharks are not reproducing fast enough to replace numbers taken as bycatch. They are placed on the Endangered Species List, and a fishing boat will be fined for catching more than two blue sharks.
  - The blue shark population continues to decline, and it is now illegal to catch *any* blue sharks.
  - White sharks are suddenly in demand because a famous restaurant chef has created a fabulous new white shark recipe.

#### DEEPER DEPTHS

- (1) Students create graphs that show the volume of their catch and bycatch and the percent bycatch of each species.
- (2) Assign one group of students the role of fishermen and another group the role of shark population biologists. The two groups debate net fishing.