



Instructions for Scales and Tails Activity

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Concepts

- Fish are found in greatest abundance on continental shelves, near islands, and in areas of strong upwelling. Few fish are found in the open ocean.
- Fishing pressure has reduced most stocks of commercially caught fish to near or below the population size that can support continued fishing
- Maximum sustainable yield is the greatest amount of fish that can be caught annually where the number of fish caught is replaced by reproductive recruitment
- Fishermen must pay the costs of their boat loan, insurance, fuel, fishing gear, safety equipment, fishing license, crew, food, and bait in order to go fishing. They also have homes, cars, health insurance, and family expenses. These financial pressures motivate fishermen to catch as much fish as the laws allow
- Restrictions on fishing include mesh size (the size of the openings in a fishing net), closed fishing areas, closed seasons or days, a cap on total allowable catch weight per season, bans on some types of gear, and limits on the number of licenses issued
- Some types of fish are much more valuable than others; these species are the target of heavy fishing pressure
- Fisheries can be managed to support a sustainable annual amount of catch

Materials

Local nautical chart showing fishing grounds
Pictures of fish species and fishing gear
Pans or trays to hold "fish" (11" x 15" baking pans work well)
About 15 goldfish crackers per pan
About 12 pretzel goldfish crackers per pan
3 giant goldfish crackers per pan
About 10 colored goldfish crackers per pan blue ("bluefin tuna") are especially valuable
Straws to use for catching fish
Cups for collecting caught fish

Procedure

1. Introduce fish species, fishing grounds, and fishing methods, using pictures and chart.
2. Divide students into groups so that two or three students are fishing from the same pan.
3. Distribute straws to students. They must catch fish by placing the straw on a selected fish and holding on to it by suction while they transport it to their cup. Each student should have his or her own cup, placed a few paces away from the fishing grounds.
4. Tell the students the colored fish, large fish, and especially blue fish are valuable. When you say "start fishing!" the students may fish for 10 seconds. Students must catch one large, or 1 blue, or 2 colored, or 5 regular goldfish to stay in the game.

5. Assess the populations of fish remaining in the pans. If at least one of a type of fish is left, it reproduces; add 1 fish for each one left.
6. Students may fish again for another two rounds. After three rounds, the price of pretzel fish has gone down too far and they must be thrown back when caught.
7. Give students a minute to decide if they would like to regulate the fishery in any way. Students may decide to cooperate to catch enough fish, and both contribute to a single cup. They may also make agreements about how many or what types of fish to catch. If the other students don't agree to the rules, they don't have to follow them.
8. Allow students to fish again for another few rounds, then stop the fishing and wrap up. Give students a few goldfish crackers from a separate container to eat if they want to- the fish from the game have been handled and should not be eaten.
9. Discuss with students:
 - What happened to the populations of different types of fish?
 - What fish were removed from the population first?
 - How successful were the fishermen in each round of fishing?
 - What could be done to ensure that the fishermen catch enough to make a living, and the fish populations are not wiped out?



George's Bank

highly productive fishing grounds off Cape Cod