Name _____ Date _____ Class _____

Managing Fisheries

Pre-Lab Discussion

When explorers first came to the shores of North America, they were amazed at the abundance of resources—towering forests, clear streams, vast grasslands, and a large variety of wildlife. As they began to use these resources, they also began to affect them. Throughout the years, populations of plants and animals have increased and decreased as a result of both natural events and human actions.

One example of a population that has changed over the years is fish. The waters off the shores of North America have supplied large quantities and varieties of fish. Overfishing and other abuses of the fishing areas have caused the populations to greatly decrease. But people are also taking action to protect the fish. In this investigation, you will model a population of codfish off the Grand Banks—a famous fishing area off the coast of Newfoundland, Canada. You will determine the effect of different events on that fish population.

1. Is a fishery a renewable resource or a nonrenewable resource? Explain your answer.

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2. Aquaculture is the farming of water organisms. How might increased aquaculture of fish in an area help the local fisheries? How might it harm them?

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Problem

How does a fish population change over time?

Safety  *Review the safety guidelines in Appendix A of your textbook.*

Use caution when cutting with scissors.

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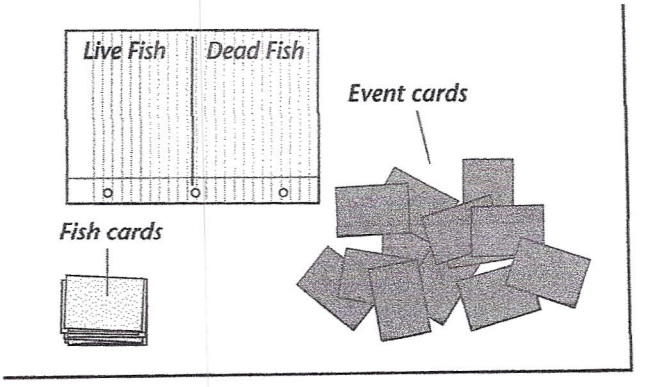
Procedure

1. As a group, make 8 "fish cards" from each sheet of colored paper, for a total of 64 cards. Write "Fish" on one side of each card. These fish cards represent the population of cod in fisheries off the Grand Banks. Each card represents many fish.
2. Divide a sheet of notebook paper in half. Label one half "Live Fish" and the other half "Dead Fish."
3. Obtain a set of event cards from your teacher. These cards represent events that can affect a fish population.
4. Shuffle and spread out the event cards, facedown. Count off 25 fish cards and place them by the notebook paper, as shown in Figure 1. Set the remaining 39 fish cards aside.



5. Pick up an event card. As a group, discuss and decide if the event you have chosen will likely increase or decrease the fish population.
6. If the event will increase the population, place a fish card from the stack of 25 on the Live Fish area of the notebook paper. If it will decrease the population, place a fish card on the Dead Fish area of the paper.
7. Replace the event card and mix up the event cards again.
8. Repeat this procedure until all 25 of the fish cards have been placed on either live or dead fish piles on the paper.
9. Count the number of live fish cards on the paper. Add half that number of fish cards from the remaining 39 cards to the live fish stack to represent additional fish added by reproduction. Remove the dead fish cards and set them aside with the remaining fish cards. Complete the Data Table in the Observations section for Generation 1.
10. The stack of live fish cards now represents the beginning of the second generation of fish. Repeat steps 5–9 to find out what happens to the second generation of fish.
11. Repeat steps 5–9 to find out what happens to the third generation of fish.

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Managing Fisheries *(continued)*

Observations

Data Table

Starting number of fish cards: 25		
Generation	*Number of Live Fish Cards at End of Generation Before Reproduction*	*Number of Fish Cards After Reproduction*
1		
2		
3		

Analyze and Conclude

1. How did your fish population change over time?

2. Compare the numbers of fish at the end of each generation. Explain your results.

3. What are some ways this investigation models natural selection?

4. What are some ways in which natural selection differs from this model?

Critical Thinking and Applications

1. How would fishing crews using a net with a large mesh affect the fish population compared to fishing crews using a net with a small mesh?

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2. List two factors not listed in the questions or on the event cards that would affect the fish population.

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3. Think about the effect that an increase in the predator population has on the fish population. Does this effect apply to all animal populations? Explain your answer.

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More to Explore

Choose a different species to investigate. Make your own set of event cards and a data table. Be sure some events will likely increase the population and some will likely decrease it. Repeat the activity, using your event cards and data table. Write a paragraph explaining your results.