

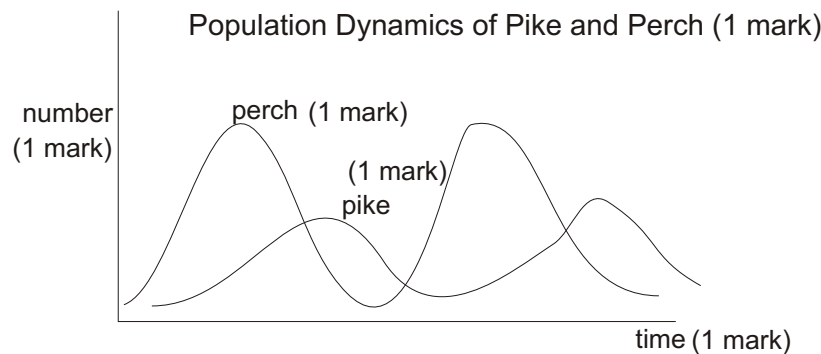
# Pike and Perch Game

## TEACHER'S INSTRUCTIONS:

- separate the class into groups of 3
- hand out 1 Pike and Perch Game per group
  - note: the students should get pages 2,3, 4 and 5 of this package and 10 copies of page 6 (in order to get 60 pike pieces and 150 perch pieces)
- read through the setup and rules to ensure that all students understand the game
- let the groups play the game and complete the assignment.
- correct the assignment afterwards

## ANSWER KEY FOR QUESTIONS: 10 marks

- 1) Graph the results by plotting the number of perch and the number of pike as the dependent variables and the number of generations as the independent variable. Use different colored lines to distinguish between the populations. (5 marks) Use graph to answer the following questions.



- 2) Why does it make sense that there are more perch than pike? (1 mark)
- Since pike eat a lot of perch there needs to be many more perch than pike in order for the pike to survive.**
- 3) How do changes of pike population relate to changes of population of the perch? (1 mark)
- The pike population responds to the population of perch. This means that an increase in perch population will cause an increase in pike population and vice versa.**
- 4) What might happen to the prey population if the predators are completely removed? (1 mark)
- If there are no predators, the prey's population would continue to increase until they run out of food or die from stress due to over-crowding or disease.**
- 5) In what ways are the presence of a predator beneficial to the prey? (2 marks)
- Predators are beneficial to prey because they can help control its population and prevent disease and over-crowding.**

# Pike and Perch Game

## OBJECTIVES:

- to learn about population dynamics
- to be able to interpret and create graphs of population dynamics

## TASKS:

- play the Pike and Perch Game
- complete the set of questions on page 3

## KEY TERMS:

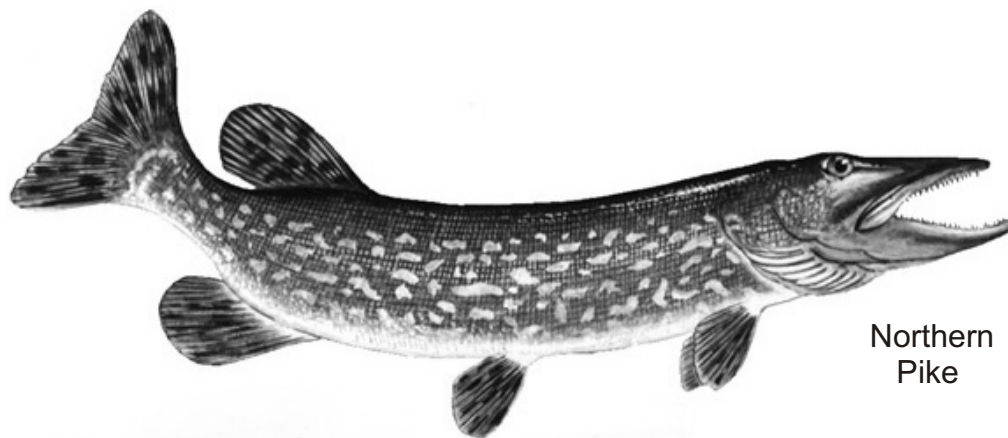
- habitat: an animal's surrounding

## SETUP FOR GAME:

In Manitoba, yellow perch are found in rivers, streams and lakes (such as Lake Winnipeg). Yellow perch feed in mid-water or on the bottom of their habitat. They are eaten by walleye, northern pike and lake trout. In this game, northern pike are predators and they will prey on yellow perch. The habitat will be Lake Winnipeg.

To begin, mark out a 50 cm by 50 cm habitat area (Lake Winnipeg). You will also need 150 yellow perch pieces and 60 northern pike pieces. At first, there are no perch in the habitat. Then 3 perch migrate into the lake. Simulate this by having one member of your group place 3 perch pieces in the habitat strategically. Next, 1 pike migrates into the habitat. Simulate this by having another member in your group place the pike playing piece over as many perch as possible. Any perch that is at least half covered by a pike is considered captured and is therefore removed from the lake. Follow the rules and continue in this manner for at least 30 generations.

Be sure to keep track of how many perch are captured by the pike on the data sheet. You will need this information to graph the data and answer some questions after the game is complete.

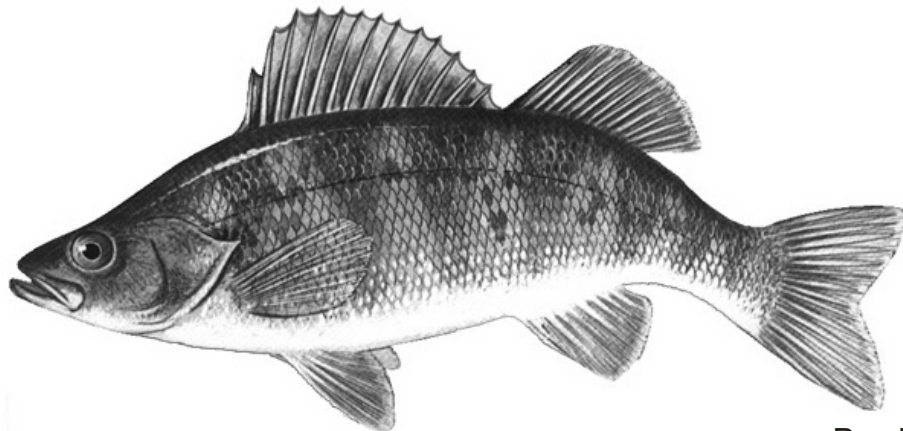


Northern  
Pike

# Pike and Perch Game

## RULES:

- 1) Each generation the perch population doubles. If there were two perch left after predation you add two more perch so that the next generation has four. If there were 27 perch left at the end of generation 7 then you would start generation 8 with 54 perch.
- 2) If, after doubling, there are still less than 3 perch in the lake more will migrate to make sure at least 3 perch are living in it.
- 3) A pike must capture at least 3 perch in order to survive into the next generation. If it captures less than 3 it dies and is removed. If it captures 3 it survives and reproduces, adding 1 more new pike to its population. If a pike captures 6 perch then 2 more new pike are added to the population. If 9 perch are caught then add 3 more new pike. Note: the new pike are added in addition to the original pike.
- 4) If no pike survive at the end of a particular generation, then 1 migrates into the habitat and starts the next generation.
- 5) The carrying capacity of this lake equals 150 perch. Therefore this is the maximum perch population possible in the lake.
- 6) Remember that pike will always eat as many perch as possible. Always kill as many perch as possible with each Pike.
- 7) Continue the game for at least 30 generations.



Perch

# Pike and Perch Game

## **QUESTIONS:** 10 marks

- 1) Graph the results by plotting the number of perch and the number of pike as the dependent variables and the number of generations as the independent variable. Use different colored lines to distinguish between the populations. (5 marks) Use the graph to answer the following questions.
- 2) Why does it make sense that there are more perch than pike?(1 mark)
- 3) How do changes of pike population relate to changes of population of the perch?  
(1 mark)
- 4) What might happen to the prey population if the predators are completely removed?  
(1 mark)
- 5) In what ways are the presence of a predator beneficial to the prey? (2 marks)

# Pike and Perch Game Data Sheet

Genera- tion	# of Perch	# of Pike	Perch Caught	New Pike	# of Dead Pike	Total Pike	Perch Remaining
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
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