



The Kokanee Spawning Adventure

LESSON

GRADE LEVEL K-8

CATEGORY Plants, Animals
& Habitats

TOPIC Kokanee

TIME

45 to 90 minutes

MATERIALS

- Photo copies of game board (1/group)
- Fish markers (game pieces) (1/student)
- Pencils or pens
- Dice (1/group)
- Index cards (1 per student plus extras)

SETTING

Classroom

GROUP SIZE

Groups of 3–6

SUBJECT AREAS

Science, Language Arts,
Social Studies

KEYWORDS

Human impact, milt, natural hazard, predator, redd, salmon run, spawning

Overview

Students will play a board game in which they encounter some of the benefits and hazards, both natural and man-made, which kokanee encounter on their migration to the spawning grounds. Students are required to identify additional benefits and hazards as they play the game.

Objectives

Students will be able to:

- list three or more benefits which kokanee encounter during spawning
- list three or more hazards which kokanee encounter during spawning
- identify three or more human impacts that threaten spawning kokanee

Background

The spawning period is a physically demanding and very challenging time for kokanee. As spawning time draws near, the kokanee stop eating and the bodies of both males and females undergo extensive changes.

The males' bodies turn from silvery to bright red, except for their heads, which turn green. Their jaws elongate, and they develop hooked snouts. The males also develop humped backs.

The bodies of the female kokanee also change colour, though not as dramatically as the males. The females develop a reddish tinge and their heads turn slightly green. As these changes are taking place, the females' bodies become swollen with eggs.

The spawning period is also marked by a tremendous drive to find a suitable place to spawn. Some spawning kokanee journey back to the stream where they were hatched, others make their way to lakeshores and other suitable streams to spawn. In any case, the spawning journey is fraught with danger.

Predators, such as osprey (*Pandion haliaetus*) and eagles (*Aquila chrysaetos* and *Haliaeetus leucocephalus*), grizzlies (*Ursos arctos*) and black bears (*Ursus americanus*), and even other fish find the spawning kokanee an easy meal.

Other natural hazards which kokanee typically encounter during the spawning journey include shallow water and waterfalls, both of which interfere with the ability of the kokanee to reach their spawning grounds. Human impacts include dams, log jams and all human activities which detrimentally alter or destroy the streams the kokanee must travel and the areas which traditionally are the kokanees' spawning beds.

The kokanee who successfully complete the journey find suitable spawning sites, with clean gravel and strong currents. It is here that the females dig their redds and lay their eggs, which the males fertilize with milt.

From a human perspective, these spawning journeys – called salmon runs – are both fascinating and beautiful. During spawning period, people often gather to watch as woodland streams seem to come alive with thousands of spawning fish.

For the kokanee, however, spawning is physically demanding and, shortly after the eggs have been laid and fertilized, the adult kokanee die.

Procedure

1. Discuss why kokanee migrate. Books on this subject may be helpful.
2. Brainstorm with the class the obstacles which the kokanee must overcome en route to their spawning streams.
3. Make copies of the game (page 23), then set up the game and hand out 1 index card to each player.
4. Explain the rules of the game:
 - a. Each player:
 - selects a fish marker,
 - sets the fish marker at the start of the game board,
 - and rolls the die to determine order of play.
 - b. Each player writes on the card:
 - one benefit or hazard that affects kokanee, and
 - the number of squares the reader will move (forward for benefits, backward for hazards, a maximum of 4 spaces per turn).
 - c. Once all the cards have been created place them in the appropriate places on the board.
 - d. The player whose turn it is rolls the die and moves his/her fish marker the number of squares indicated by rolling the die.
 - For each square a player lands on where information is provided, he or she must decide if it is a benefit or a hazard to kokanee. If it is a benefit, the player must move ahead one square. If it is a hazard, the player must pick a card, discuss the benefit or hazard provided and move according to the number of squares suggested.

- When a player lands on a benefit square, he or she picks a benefit card; when a player lands on a hazard square, he/she picks a hazard card. The player then moves the specified number of squares ahead or back.

- e. Players proceed around the game board, following the instructions on the spaces where they land.
5. After the game, discuss with students the worst hazard and the greatest benefit they encountered. Also discuss human impacts and enhancements.
6. Discuss with students how hazards can also be benefits in some cases. For example, a few fallen trees could provide shelter for the young kokanee, but too many fallen trees might make it hard for the adult kokanee to lay their eggs.

Assessment

1. List the changes which kokanee undergo before and during spawning.
2. List the habitat requirements of a spawning kokanee.
3. List human created and natural hazards which kokanee must overcome in order to spawn.

Extensions

1. Direct students to create their own game boards, complete with benefits and hazards, then encourage them to share their game boards with younger students.
2. Discuss solutions to problems, both natural and human-made, which the fish may encounter at different stages of the spawning period.
3. Direct students to sketch a scene illustrating one of the benefits or hazards the kokanee encountered on the game board.

