Dining at the Krill Grill

Purpose: To examine the relationship between the pyramid of numbers and a food chain.

Materials:

- 20 sport bibs: 10 in one colour and 10 in a second colour
- 1 large plastic bag per student
- 200 Popsicle sticks (or foam packing 'peanuts')
- 1 stopwatch
- 1 Whistle

Procedure:

1. Have students copy the following table into their science books.

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Number of live organisms	Krill	Salmon	Seals
Trial 1			
Start (0 min.)			
After 1 min.			
After 2 min.			
After 3 min.			
Trial 2			
Start (0 min.)			
After 1 min.			
After 2 min.			
After 3 min.			

2. Divide the students into three equal groups; krill, salmon and seals. Have the krill put on one coloured bib. Have the salmon put on the second coloured bib. The students who are the seals do not wear a bib. Extra students can be used to record class data.
3. Mark a boundary for your playing area. Spread the Popsicle sticks throughout the playing area.
4. Play the game as follows:
   a) Spread the children throughout the playing area.
   b) When you blow the whistle the krill can begin to eat the phytoplankton (Popsicle sticks) by picking them up off the ground and putting them in their "stomachs" (plastic bags). After 30 sec., blow the whistle again. The krill will stop eating and stand still.
   c) Blow the whistle for the third time and everyone can begin to feed.
   d) Krill continue to "eat' the Popsicle sticks. The salmon "eat" the krill by tagging them and taking the Popsicle sticks they collected. The salmon put the sticks into their own plastic bag. The salmon cannot eat seals. The seals eat the salmon but tagging them and collecting their Popsicle sticks and putting them in their plastic bags. The seals cannot eat the krill.

   *If you are a krill or salmon that has been eaten and you have given your contents to the salmon or seal then you go to the sideline and wait for the next round.
5. After 1 minute, blow the whistle again. The students stop where they are, count and record the number of krill, salmon and seals that are still alive.
6. Blow the whistle to continue for another minute. Count and record the number of krill, salmon and seals that are still alive. Play a total of 3 rounds.
7. Play the game again, but his time divide the class into a ratio of 9 krill: 3 salmon: 1 seal. For a class of 26 students, there would be 18 krill, 6 salmon and 2 seals. Record your results for trial 2 on your chart.

Questions:

1. In trial 1 the populations of krill, salmon and seals were the same size. In trial 2 the population of krill was larger than the population of salmon, and the population of salmon was larger than the population of seals. Which trial is closer to what actually happens in nature? Explain your answer.
2. Krill feed on phytoplankton. What might happen to the food chain if only half as much food was available to the krill?
3. What would happen, if for some reason no salmon were around for a year?

a) What would happen to the krill population?
b) What would happen to the seal population?
c) What would happen if the salmon were over fished?