

## Details



**Completion Time:** About one period

**Permission:** Download

## Bering Sea Fabulous Food Chain Game

### Overview

Students will sort organisms found in the Bering Sea into food chains and gain an awareness of the flow of energy and nutrients in the Bering Sea Ecosystem.

### Objectives

Students learn about the different organisms that live in Alaskan waters by playing the Fabulous Food Chain Game. In playing the game, they become aware of the flow of energy and nutrients in the Bering Sea Ecosystem and the functions they serve.

### Lesson Preparation

Read *The Bering Sea: WHO LIVES THERE?* in the attached Activity Guide.

### Procedure

To play the game:

1. Shuffle the cards. Deal five cards to each player. Place the rest of the cards face down on the table.
2. The player on the dealer's left selects a card from his/her hand. This card serves as the 'start' point for the game.
3. The second player selects a card from his/her hand and builds to the left OR right of the start card. A card representing an organism eaten by the organism on the start card is placed to the left. A card representing an organism that eats the organisms on the start card is placed to the right.
4. If a player cannot place a card down, the player must draw from the deck until a card can be played. If no cards are left on the table, the player must pass. Play continues until a food chain is completed. The winner is the player with no cards remaining or the fewest cards remaining when the food chain is completed.
5. Before you play again, list organisms in the data table that made up your food chain. Play the game 4 or 5 times to build up several food chains.

## Materials

- Alaska Fisheries Species Cards (two cards per organism)
- Activity Guide (1 per each group of three or 4 students)



## **Extension**

Musical and Kinesthetic:

Sing "The Ice Algae Grew Underneath On The Ice" (included in Activity Guide). Make it kinesthetic by providing name necklaces for all the organisms in the song. As the song is sung, those organisms sung will stand up. After the stanza is sung, the students will sit back down. The students will stand up every time they hear their name sung. At the end of the song, all the students will stand. The teacher can assess student understanding by asking questions about the organisms standing.

Art and Kinesthetic:

Students create bracelets or necklaces using cord (sparkly plastic cord represents energy). They use different beads, pasta, or paper cutouts to represent different links in the food chain and string them on the plastic cord. Tie them on wrist, or ankle, or around the neck.

## **Resources**

N/A

## **Assessment**

N/A

## **Credits**

Maggie Prevenas, [prevenas@hawaiiintel.net](mailto:prevenas@hawaiiintel.net)



**National Science Education Standards (NSES):**

**Content Standards, Grades 5-8**

Content Standard C: Life Science

- a. Structure and function in living systems
- d. Populations and ecosystems
- e. Diversity and adaptations of organisms

**Other Standards**

N/A

## Activity Guide

Write examples of organisms from the Fabulous Food Chain Games in

The Data Table

Game #	start card organism	eats what organism	eaten by what organism
1			
2			
3			
4			

Reflection:

1-Which organisms in your card deck are herbivores?

2-Which organisms in your card deck are carnivores?

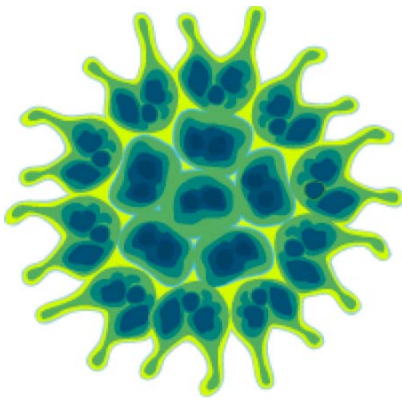
3-Which organisms in your card deck are omnivores?

4- Which organisms are scavengers or decomposers?

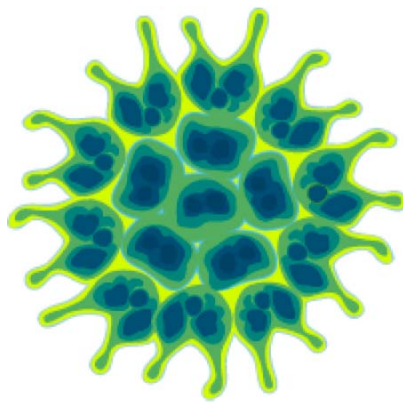
5- List 5 predator/prey relationships?

6-What is being passed from one organism to another in the food chain?

7-What organisms are producers? Why do you think they are called that?



Phytoplankton



Phytoplankton



Zooplankton



Zooplankton



ICE Algae



ICE Algae



Krill



Krill



Squid



Squid



Fish



Fish

## The Bering Sea: WHO LIVES THERE?

The Bering Sea nutrient rich water supports floating, speck-sized photosynthesizing organisms called phytoplankton. Phytoplankton are producers for the Bering Sea ecosystem. A large number of phytoplankton are diatoms. Diatoms have clear glass shells through which sunlight passes. Chlorophyll in the diatom transforms energy in sunlight, water, and carbon dioxide into food energy. Diatoms live throughout the cold winter layered inside and underneath the Bering Sea ice.

In the spring these tiny producers melt free from the ice. They float near the surface in the stable column of meltwater. Nutrients found in and released from the benthos boost and fertilize the photosynthetic diatoms. The Bering Sea waters turn dark green from the phytoplankton population explosion. Zooplankton such as euphausiids (krill) and pollack larvae devour the phytoplankton by the billions. These are then caught and eaten by larger fish, birds, and some cetaceans. The nutrients and energy found in organisms are transferred into the next organism that eats it. Scavengers and benthic organisms act to recycle the nutrients from organisms that sink to the bottom (benthos).

### PHYTOPLANKTON and ALGAE

- Phytoplankton are speck-sized plants that are the major producers of the Bering Sea and Northern Pacific Ocean.
- Algae are very small plants found free-floating in the ocean waters.
- Phytoplankton and algae are the base for the food chain. They use sunlight and transform it into food energy.
- Eaten by krill, zooplankton, and some fish.

### ZOOPLANKTON

- Zooplankton are microscopic animals
- Eat algae and phytoplankton.
- Eaten by krill and some fish.

### KRILL

- Small (1cm to 15cm) red, shrimp-like creatures.
- Looks like a crayfish without the front claws.
- Eats phytoplankton, algae, and zooplankton.
- Eaten by fish, squid, seabirds, seals, and bowhead whales. Provides food source for many ocean organisms

### WALLEYE POLLACK (Larvae)

- I don't know a whole lot about baby Pollack but here's what I do...
- Eat plankton and algae, zooplankton, krill.
- Eaten by other fish (including bigger Pollack), squid, seabirds, seals, and whales.

### WALLEYE POLLACK (adult)

- Swim in giant schools
- One of the largest fisheries in the world (2 million metric tons) in Alaskan waters
- Eats baby Pollack and lots of other stuff
- Eaten by humans, cetaceans, seals, other fish, etc

### SQUID

- There are many species (30-40) found in Alaskan waters.
- Sometimes found in groups called shoals.
- Food source for larger animals.
- Eats small fish and krill.
- Eaten by seabirds, seals, and whales.

### SEABIRDS (more specific of course)

- A large variety of birds visit the Alaskan region.
- Eat fish, squid, and krill.
- Eaten by seal, predator birds, killer whale.

### SNOW AND KING CRAB

- Crabs are scavengers.
- Eats many organisms that sink to the bottom
- Eaten by seals, ducks, fish

### BEARDED SEAL

- Has bristly whiskers that look like beard.
- Head colored from mud grubbing
- Eats clams and mollusks, crustaceans, and benthic worms
- Eaten by humans, polar bears, orcas.

### WALRUS

- Has bristly whiskers that look like beard.
- Has u shaped tongue to draw in food
- Eats clams, other mollusks, and benthic organisms
- Eaten by polar bear

### RIBBON SEAL

- spends entire life on ice or in ocean water
- brown with white stripes
- Eats ?
- Eaten by killer whales and polar bears.

### BOWHEAD Whale

- Longest baleen of any whale
- Eats krill, zooplankton, and fish that it strains through its baleen.
- Eaten by killer whales and polar bears. Alaskan Eskimo also hunt bowhead for food

### HUMPBACK WHALE

- uses baleen to strain small plankton and fish from water
- tail marking used to identify individual whales
- migrates to Hawaii and Mexico to give birth and mate
- Eats zooplankton, krill, Pollack and other small fish
- Eaten by killer whale and polar bear

### KILLER WHALE

- Super carnivore in Alaskan waters
- Travels in packs or family groups called pods
- Eats seals, fish, and occasionally other whales
- Eaten by ?

### POLAR BEAR

- Known to actively hunt humans
- Male polar bears do not hibernate
- Eats ANYTHING!
- Eaten by? (I do believe it is a super carnivore)





## **The Ice Algae Grew All Around**

By Maggie Prevenas

Sing to Folk Song "The Green Grass Grew All Around"

There was some ice in the Bering Sea  
The prettiest ice that you ever did see.  
Well, the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath.*

And on this ice were diatoms  
The greenest diatoms that you ever did see  
Well, producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

These diatoms were food for krill  
The cutest krill that you ever did see  
Well the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

Those krill are lunch for larvae fish  
The littlest fish that you ever did see  
Well the fish eat the krill  
And the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

And itty bitty fish get chomped by more  
More Pollack fish than you ever did see  
Well the fish eat the larvae  
And the larvae eat the krill  
And the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

Those walleye fish are people food

They chew more fish than you ever did see  
Well the people eat the fish  
And the fish eat the larvae  
And the larvae eat the krill  
And the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

Some Pollack fish get nabbed by whales  
The biggest whales that you ever did see  
Well the whales eat the fish  
And the fish eat the larvae  
And the larvae eat the krill  
And the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

More Pollack fish they die and sink  
And feed the crabs in the benthos below  
Well the crabs eat the dead  
As they scavenge down below  
And the Pollack eat the larvae  
And the larvae eat the krill  
And the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

The things that live in the sediment there  
Feed bearded seals with heads in the mud  
Well the benthos feeds the seals  
And the seals eat the crabs  
And the crabs eat the dead  
As they scavenge down below  
And the Pollack eat the larvae  
And the larvae eat the krill  
And the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*

The nutrients from down below  
Turn from the deep spring melting snow  
Well producers on the ice  
Fertilized now can grow  
Turn the seawater green  
Feed the plankton that float  
And it all feeds the seals  
And the seals eat the crabs  
And the crabs eat the dead  
As they scavenge down below  
And the Pollack eat the larvae  
And the larvae eat the krill  
And the krill ate the green  
Producers on the ice  
And the ice in the sea  
*And the ice algae grew underneath on the ice*  
*And ice algae grew underneath*