

## Antarctic Food Webs

Lesson Summary: Students will be able to understand the animal interactions in cold environments like Antarctica.

### Materials:

- Jenga x 4
  - Game Contents – 1 set of Jenga
    - 21 green blocks (Phytoplankton)
    - 12 blue blocks (Zooplankton)
    - 12 red blocks (Krill and small fish)
    - 1 purple block (Whales)
    - 1 stack of playing cards
    - Informational whale cards
    - food web diagram
    - vocabulary



### Focus Questions:

- If the ocean is so large, why do small changes make a difference?
- How can something as large as a whale be impacted by changes in the ocean?

### Procedure:

1. Read BOOK: Arctic Appetizers by Gwendolyn Hooks
2. Tell them that today they are going to play a little game to show how the Arctic food web works and how everything is interconnected there.
3. In the arctic and around the world there are 4 main types of organisms that make up a food web. The bottom of the food web has a lot of plankton. There are two types of plankton in the world. There are phytoplankton that act like plants and use the sun to make their own food. Zooplankton is next.
4. Ask the students....Where do you go to visit animal

### Playing the game:

1. The first player picks a card, reads it aloud and follows the instructions written on the card. Only the block being removed or returned may be touched. (You are not allowed to hold the rest of the stack together while removing the blocks.)



2. Put the used cards into a discard pile.
3. Place removed wood blocks into a discard pile off to the side.
4. Continue to take turns until the tower falls and the food web collapses or all cards are used up.
5. Reset to play again using the directions above.

Review questions:

1. What surprised you in playing this game?
2. What did you discover about human influences on the environment?
3. What questions would you like to investigate further?

Reflect these questions in your journals.

Whale and Whale Facts

**HUMPBACK WHALE**

**Features**

- About 50 feet long
- Knobs on head and flippers
- Long flippers

**Food**

- Small fish, krill
- Eats up to 1.5 tons a day

**Fact**

- Very acrobatic whale

- Produces long complex songs

**GRAY WHALE**

**Features**

- About 45 feet long
- Barnacles and lice on body
- No dorsal fin

**Food**

- Amphipods, mysid shrimp, other crustaceans, and tube worms sucked from the muddy bottom



### Fact

- Long annual migration from Arctic to Baja California (10,000 to 14,000 miles)

## FIN WHALE

### Features

- About 78 feet long
- V-shaped head
- Asymmetrical coloration on underside of jaws and baleen

### Food

- Krill, small fish
- Eat up to 2 tons a day

### Fact

- Second largest whale

## BLUE WHALE

### Features

- About 80 feet long
- Small triangular dorsal fin towards end of back
- Tall blow (30 feet)

### Food

- Krill, other crustaceans, small fish
- Can eat up to 4 tons a day (40 million krill!)

### Fact

Largest animal ever to live on Earth



Explosion in population of invasive filter feeding invertebrates consume too much zooplankton.

Remove 1 **blue** block.

Harmful algal blooms creates toxin.

Remove 1 **blue** and 1 **red** block.

Bacteria decomposing algae following a bloom pull oxygen from ocean water.

Remove 1 **blue** and 1 **red** block.

Changes in ocean currents, disperses phytoplankton.

Remove 2 **green** blocks.





<p>Increase in atmospheric carbon dioxide (CO<sub>2</sub>) leads to increased ocean acidification.</p> <p>Remove 2 red blocks.</p>	<p>Successful beach clean-up reduces near shore blooms.</p> <p>Put back 1 blue block.</p>
<p>Sunlight reaching ocean increases.</p> <p>Put back 1 green block.</p>	<p>Pollution through storm drains increased with storms.</p> <p>Remove 1 green and 1 blue block.</p>



<p>Chemical spill in watershed.</p> <p>Remove 1 green, 1 blue and 1 red block.</p>	<p>Layer of smog reduces sun reaching ocean.</p> <p>Remove 1 green block.</p>
<p>Oil spill in harbor.</p> <p>Remove 1 green, 1 blue and 1 red block.</p>	<p>Increase in ocean temperature leads to smaller phytoplankton, unsuitable as food for zooplankton.</p> <p>Remove 1 blue and 1 red block.</p>
<p>Whales leave the area.</p>	<p>Blue whales remain in area longer than usual.</p>



Put back 1 red block.

Remove 1 red block.

Changes in ocean currents decrease upwelling.

Rise in ocean temperature.

Remove 1 blue block.

Remove 1 green, 1 blue and 1 red block.



Rainwater influx into ocean reduces the concentration of phytoplankton.

Remove 2 green blocks.

Introduction of invasive zooplankton reduces the number of phytoplankton.

Remove 1 green block and put back 1 blue block.

