

# Museum Educator's Guide:

## “Catching Krill”

### Station Overview

Students will observe real whale baleen and whale teeth specimens, make predictions about which adaptation is most effective in catching krill, and then simulate each adaptation. They will use the data they collect to draw conclusions about which adaptation is most beneficial in catching krill.

### Next Generation Science Standards

**4 LS 1-1:** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

### Disciplinary Core Idea

**LS 1.A:** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

### Materials

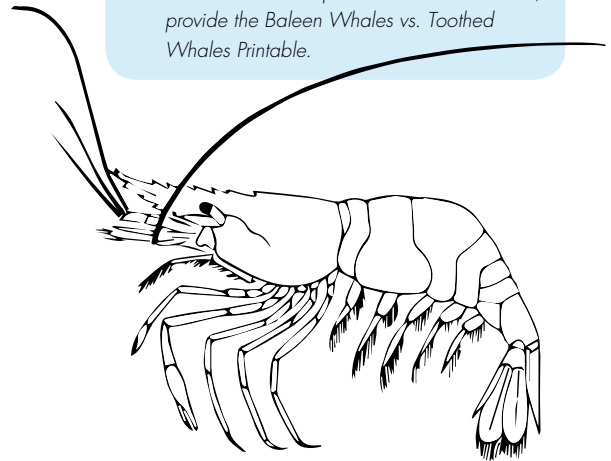
- Dried rosemary
- 16 oz. clear plastic tub
- Water
- Fine tooth pocket comb (plastic)
- Tweezers
- Hand towel
- Paper towels
- Toothpicks
- \*whale & krill specimens:
  - Baleen (borrow from your local natural history museum)
  - Whale teeth (borrow from your local natural history museum)
  - Krill specimen (borrow from your local natural history museum) or purchase freeze-dried krill ([www.wardsci.com](http://www.wardsci.com), Item #212830)

### Set Up the Station



1. Place the krill tub at the station.
2. Set out the combs and tweezers.
3. Set out toothpicks, paper towels, as well as a hand towel for any spills.
4. Set out the baleen, whale teeth, and krill specimens.
5. Place all printed materials at the station.



- For each rotation, it is optimal to have 1 comb, 1 pair of tweezers, and 1 tub per 3 students in the group. Adjust the amount of materials you need accordingly.
- Remember to factor in time to request whale and krill specimens from your local loan library (up to 2 weeks).
- If whale and krill specimens are unavailable, provide the Baleen Whales vs. Toothed Whales Printable.



## Worksheets & Printables

Sheet	Number to Print
 Task Card: Catching Krill	1 Per Station
Lab Sheet: Catching Krill	1 Per Student
 Discovery Sheet: Catching Krill	1 Per Station

# Task Card:

## “Catching Krill”



# Task Card:

## “Catching Krill”

### 1. Introduction

1. Look at the real baleen and whale teeth. Compare each to the size of the krill, and think about which adaptation would be the most effective in catching krill.
2. Today you will simulate feeding as these two types of whales!

### 2. Make a Hypothesis

Which tool do you predict will be the most effective in catching krill?

### 3. Experiment Procedures

#### Baleen Simulation

1. In one sweeping motion, skim the plastic comb across the surface of the water to collect as many krill as possible. Do not scoop or pin them against the side of the tub!
2. Carefully move the krill from the comb to the paper towel and count them. Use a toothpick to gently separate the krill to help you count.
3. Dry the comb and pass it to another student.
4. Record the number of krill you captured.
5. Repeat these steps two more times, and record your data.

#### Teeth Simulation

1. Pinch the tweezers together once to try to catch some krill. Do not pin the prey against the sides or bottom of the tub. It's ok if you are not able to catch any.
2. Carefully move any krill you caught to the paper towel and count them.

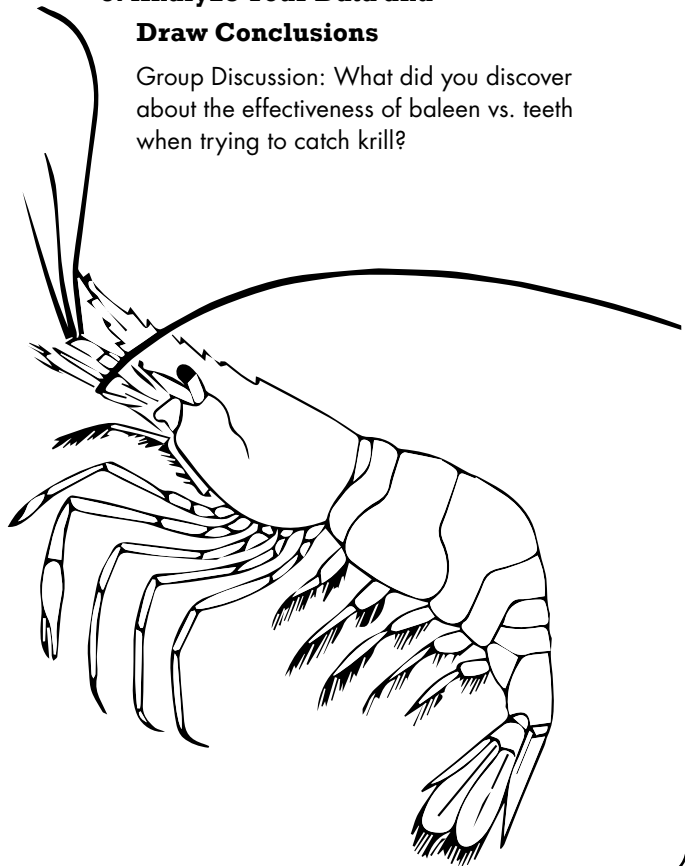
3. Dry the tweezers and pass them to another student.
4. Record the number of krill you captured.
5. Repeat these steps two more times, and record your data.

### 4. Clean Up Your Station!

1. Dry off the tweezers and the comb, and wipe up any spilled water.
2. Place used paper towels and soggy krill in the trash, and carefully straighten up all materials.

### 5. Analyze Your Data and Draw Conclusions

Group Discussion: What did you discover about the effectiveness of baleen vs. teeth when trying to catch krill?



# Lab Sheet:

## “Catching Krill”

Marine Biologist:

### Objective

Today you will conduct an experiment to simulate the differences between a whale’s ability to catch krill with baleen vs. teeth.

### 1. Make a Hypothesis

Predict which tool will be the most effective in catching krill.

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### 2. Collect Data

Number of Krill Caught		
Adaptation	Baleen (comb)	Tooth (tweezers)
<b>Trial 1</b>		
<b>Trial 2</b>		
<b>Trial 3</b>		

### 3. Analyze Data and Draw Conclusions

Group Discussion: What did you discover about the effectiveness of baleen vs. teeth when trying to catch krill?

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### BONUS!



Draw and label pictures of the real whale baleen and teeth you observed!

# Discovery Sheet:

## “Catching Krill”

### There Are Two Main Types of Whales

baleen whales and toothed whales. Humpback whales are an example of baleen whales. Instead of teeth, they have an **adaptation** called **baleen**. Baleen are flexible plates attached to the upper jaw. Humpback whales have between 270 and 400 pairs of overlapping baleen plates, with bristled lower edges. Each plate is approximately 2-3 feet long. It looks like a broom and is made of keratin. This is the same material our fingernails and hair are made of!

To feed, humpback whales swim forward and open their mouths. As the water flows in, it expands their accordion-like **ventral pleats** in their throats. This is another adaptation that allows them to gulp prey and water in very large amounts. They then use their tongues to push the water out between the baleen plates and scrape the small fish and krill trapped in the baleen into their mouths.

Humpback whales feed in cooler waters during the spring and summer months when small fish, krill, and plankton are plentiful. Humpback whales can eat as much as 2,000 pounds of food in a day! They store the excess calories in the form of blubber which provides energy and insulate them during their migration to warmer waters in the fall.

Toothed whales have peg or spade shaped teeth. Some even have tusks!



This is Baleen from a gray whale. Whale baleen can be black, brown, or cream colored. Some whales have huge baleen. A bowhead whale has baleen plates that are nearly 15 feet long!



- A humpback whale's esophagus is about the same diameter as a baseball! They are unable to swallow large prey because large pieces of food would not be able to fit down their throats!
- 2,000 pounds is about the same weight as an African elephant, or 8,000 hamburgers!



### Definitions:

**Adaptation:** a special trait that helps living organisms survive in a particular environment

**Baleen:** keratin plates that hang down in fringed, parallel columns from the upper jaw or palate of baleen whales; serve as a strainer that catches plankton and small fish while a whale is feeding

**Ventral pleats:** long folds in the skin that expand when a whale takes in large amounts of water and food

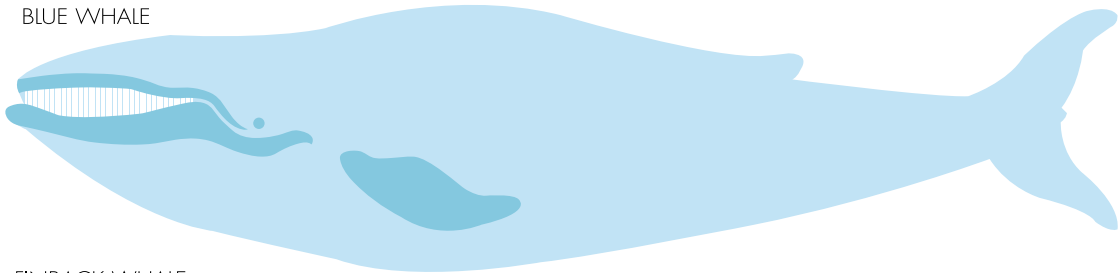
# Discovery Sheet:

## “Catching Krill: Baleen vs. Toothed Whales”

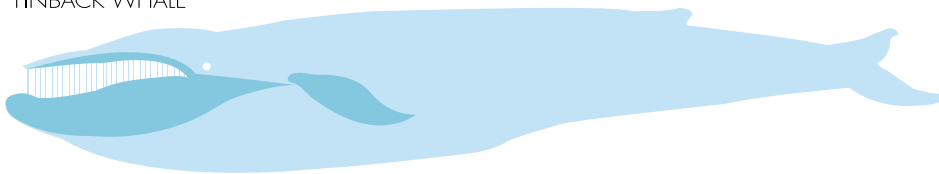


### BALEEN WHALES

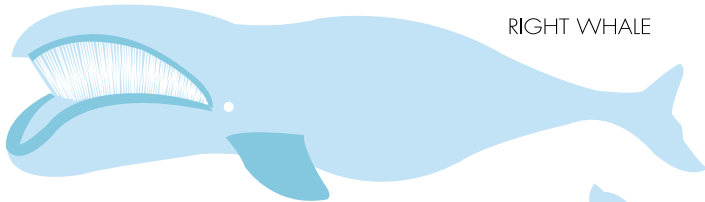
BLUE WHALE



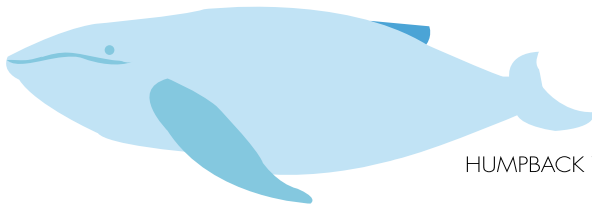
FINBACK WHALE



RIGHT WHALE



SEI WHALE



HUMPBACK WHALE



GRAY WHALE

### TOOTHED WHALES

BOTTLE-NOSED DOLPHIN



WHITE (BELUGA) WHALE



PILOT WHALE



ORCA



SPERM WHALE

