

CURRICULUM SUPPLEMENT

WATCH THAT WHALE!

A HUMPBACK WHALE IDENTIFICATION ACTIVITY

For use with the **Pelagic** section of GULF WATCH ALASKA

Overview: Students will discover that it is possible to identify individual humpback whales in the Gulf of Alaska using a photo identification key. During the first of two activities students will first come to understand just how big a humpback whale is and how much these creatures need to eat to survive. Finally by using whale watching and identifying techniques the students will be able to make positive identifications of many known humpback whales in the Gulf Watch Alaska monitoring area.

Learning Objectives:

The student will:

- *Understand and be able to explain how the **morphology of the humpback whale** (Megaptera novaeangliae) assists them in successfully foraging for their daily nutritional requirements.*
- **Employ a proven scientific technique** to identify and catalog humpback whales. Understand how this technique is used by researchers in the field to track the migration of cetaceans across vast stretches of the Pacific Ocean.

Standards Addressed:

Alaska Science GLEs:

<https://education.alaska.gov/akstandards/standards/standards.pdf>

6th: SA1.1, SA1.2, SA3.1, SE2.2

7th: SA1.1, SA1.2, SA3.1, SE1.1, SE2.2

8th: SA1.1, SA1.2, SA3.1, SE1.1, SE2.2, SE3.1

Next Generation Science Standards:

<http://www.nextgenscience.org/search-performance-expectations>

MS-LS1-4, 5, 7

MS-LS2-1, 2, 4, 5

Ocean Literacy Principles:

<http://oceanliteracy.wp2.coexploration.org/ocean-literacy-framework/principles-and-concepts/>

OLP #5 The ocean supports a great diversity of life and ecosystems.

Materials/Location Needed:

- *This lesson encompasses two activities; the first can be done at the school in an area that is large enough for the entire class to stand in (minimum of 60'x20') like an all-purpose room or gymnasium. Ideally the first activity could be staged outdoors in a safe area of a parking lot on the school grounds. The second activity can be held in the classroom.*
- *Tape measure (the longest you can find!).*
- *Painter's tape, sidewalk chalk, or a long length of highly visible yarn or sting.*



GULF WATCH ALASKA
Long term monitoring

CURRICULUM SUPPLEMENT

- 53 one-gallon milk jugs (start collecting from yours and other classes a few weeks before the activity). Rinse them out as you collect them – or you will regret it later - pew!
- Student worksheet (found on pages 5-8 of this lesson plan)
- Clipboards and pencils
- **Gulf Watch Whale Fluke ID** pdf – one per group (download from the “For Teachers” page of the Gulf Watch Virtual Field Trip)
- **Who’s that Whale** PowerPoint slideshow (download from the “For Teachers” page of the Gulf Watch Virtual Field Trip)
- A computer and projector/screen with the ability to run a PowerPoint presentation
- A digital camera or smart phone that can be used to take photos (multiple cameras or phones can also be used)
- Student access to Google Maps or Google Earth

Teaching Time: 60 minutes

Preparation Time: 15 minutes

Background:

Activity 1: A Whale Size Situation It can be very hard for anyone to really imagine the sheer size and immensity of a great whale if they have not had the chance to see one up close and in person. The humpback whale is one of the largest creatures on the planet. Longer than a school bus, heavier than three of them combined (two if fully loaded with students), these animals are huge!

Most everyone knows that these behemoths eat some of the smallest animals in the ocean (krill, small fish and plankton) and they use their specialized “teeth” to do so (baleen is made of the stuff fingernails are not calcium like our teeth). What most don’t know is just how much food humpback whales have to eat to maintain that huge physique. Adults can consume up to 3,000 pounds of food and babies drink over 53 gallons of milk *each day*!

Activity 2: The fluke (or tail flipper) of humpback whales is unique for each animal. Think of it like the whale’s fingerprint! Researchers are able to use these differences to identify individual whales no matter where they are in the ocean. And humpback whales sure can get around! Some migrate over 6,000 in a single year from their feeding waters in the colder waters of the north to their mating and calving waters in warmer tropical areas. Of course whales are mammals and have to come up for a breath of air pretty regularly. Sometimes after surfacing they dive deep and will show their fluke above the surface of the water. This is the chance for sharp-eyed whale watchers to snap a photo of their tail flipper (called a fluke). Researchers can then use that photo to identify the whale against a vast catalog of other whale flukes. Combining that photo and ID with other data like, the time of day and the location where the photo was taken can help researchers fill in the story as to where individual whales are and what they might be doing.

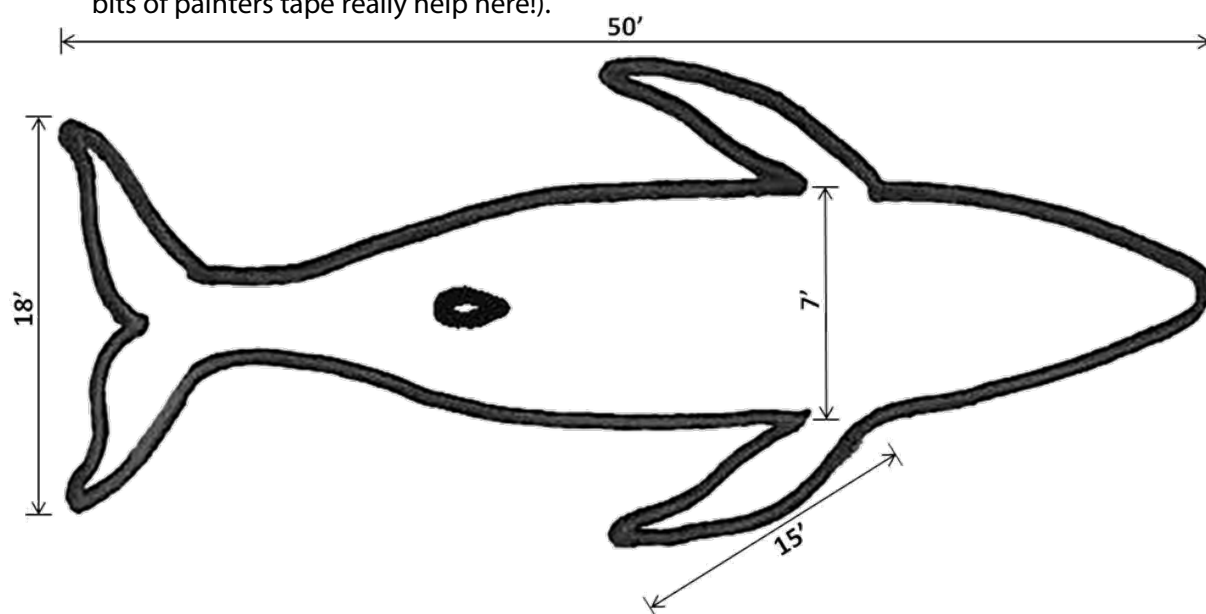


GULF WATCH ALASKA
Long term monitoring

CURRICULUM SUPPLEMENT

Directions:

1. After completing the **Pelagic** section of *Gulf Watch*, explain to your class that they are going to go whale watching! Using the same techniques that John Moran and his staff use to collect data on humpback whales in the Gulf of Alaska.
2. **Activity 1:** Take your class to a large open area where all can spread out. The ideal area would be a safe area of the school parking lot or playground where sidewalk chalk can be used. Another option is a multi-purpose room or gymnasium where painters tape can be safely applied to the floor. Have your students measure out a length of 50' using the tape measure. Then using the diagram below, measure and mark off the other dimensions (sidewalk chalk or bits of painters tape really help here!).



Length: 50' Greatest width: 7' Length of flippers: 15' Length of tail fluke: 18'

3. Next have your students complete the outline with chalk or tape. As they are working you can have students list off some amazing facts about the humpback whale, such as: baby humpbacks are born weighing nearly a ton and gain about 10 pounds per hour or 240 pounds per day! You could have your students do some fact finding prior to this activity so they can each share an amazing humpback fact – there are a lot of mind blowing stats related to these mega-mammals!
4. Now take some student measurements:
 - a. How many students can fit inside the outline?
 - b. Holding hands, with arms outstretched, how many students fit from nose to fluke?
 - c. Other measurements you or the students come up with – be creative!

GULF WATCH ALASKA
Long term monitoring

CURRICULUM SUPPLEMENT

5. Finally it's time to put to use all of those milk cartons you have been collecting. 53 gallons is the approximate amount that a humpback whale baby drinks each day! What do you think is more impressive – that the baby can drink that much or the mother can produce that much?!
6. Have your students think of an interesting way to display all those milk cartons. Have them design a sign explaining what the cartons represent and invite other classes or students to view the display and provide their thoughts and observations.
7. **Activity 2: Whale Tails Tell Tales** It's time to go whale watching! Using your projection system prepare to play the slideshow "*Who's that Whale?*" Divide your students up into "boats" of whale watchers in groups that suit your situation (6 to 8 or so).
8. Provide each "boat" with a copy of the *Gulf Watch Whale Fluke ID* handout and assign a photographer for each boat – if there are enough cameras or camera-phones available there can be more than one photographer in each boat. Assign a data collector or two to record the time and location for each sighting using their worksheet.
9. Advise your students that they will be going on a virtual whale watching trip to collect data that will identify individual humpback whales. As the slideshow plays a photo of a whale fluke will appear for the approximate amount of time a humpback's fluke is visible above the surface. The student photographers will have to be ready and quickly snap a photo of the fluke before it disappears below the surface!
10. On screen with the fluke and appearing for a minute or so after will be the coordinates of where the boat was located when the sighting took place. This information is important and should be recorded by the student researchers.
11. Once the research whale watching trip has ended it is time for the data analysis to begin. Each "boat" of student researchers will use the photos they snapped to compare to the flukes in the ID handout. Challenge your students to match as many as they can all the while making observations about the flukes – are there interesting patterns, injuries, teeth rake marks from an Orca attack?
12. Finally have your student researchers plot out on Google Maps or Google Earth the coordinates of their whale sightings. Have them note a nearby landmark from the Gulf of Alaska for each set of coordinates.

Assessment:

Students can be assessed on participation in many aspects of the activity and/or their success at completion of the worksheet.



GULF WATCH ALASKA
Long term monitoring

STUDENT WORKSHEET

Name _____ Date _____ Class _____

Activity #1: A Whale Size Situation

1. Once your class has completed the whale outline take a few minutes to record your initial observation about the size of the humpback whale. (Here's a few hints to get you started: Was it larger than you expected? Smaller? Can you imagine the whale in 3D instead of the outline?)

2. How many students from your class fit inside the whale outline? What other kinds of 'student' measurements did you make? Record the results below:

3. Research the nutritional requirements for a human baby. How much milk does the average human baby drink from its mother per day? Compare that to the amount humpback whale calves drink every day. How many baby bottles can you fill with 53 gallons of milk? Record your answer and observations below:

Activity 2: Whale Tails Tell Tales

4. Use the table on the next page to record the following data from your whale watching trip: whale identification number, any distinguishing markings or interesting observations for each fluke, date and time of sighting, latitude and longitude of the sighting, nearby landmark to the sighting lat. & long.



GULF WATCH ALASKA
Long term monitoring

STUDENT WORKSHEET

HUMPBACK WHALE FLUKE IDENTIFICATION LOG

#1 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #
Observations:				

#2 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #
Observations:				

#3 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #
Observations:				

#4 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #
Observations:				

#5 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #
Observations:				



STUDENT WORKSHEET

#6 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #

Observations:

#7 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #

Observations:

#8 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #

Observations:

#9 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #

Observations:

#10 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #

Observations:



GULF WATCH ALASKA

Long term monitoring

STUDENT WORKSHEET

#11 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #
Observations:				

#12 Date	Time	Location (Latitude, Longitude)	Nearby Landmark	Whale ID #
Observations:				

If you would like to learn more about these or any of the whales in your ID guide visit:

<http://www.alaskahumpbacks.org/Sightings.html>

Send in the ID number of the whale and if there is information they will send you life history about that particular whale, including the previous years and locations where the whale was sighted, if the whale is a known female, and whether it has been seen with a calf!



GULF WATCH ALASKA
Long term monitoring

TEACHER KEY

Whale photo ID (#'s on slides)

1. P065
2. P006
3. P243
4. P058
5. EVOS JRM 20130408-1-011
6. P138
7. P117
8. P037
9. P019
10. P016
11. P156
12. P148

Landmark

- Valdez Arm *or* Port Valdez
Hawkins Island *or* Canoe Passage St. Park
Egg Islands
Green Island
Knight Island Passage *or* Chenega Island
Port Bainbridge
Montague Island
Barwell Island *or* Cape Resurrection
Porcupine Cove
Chiswell Islands
Nuka Bay/Island *or* Ragged Island
Ushagat Island *or* West Amatuli Island