

CULMINATING LESSON

The Life Cycle of Humpback Whales

Lesson at a Glance

Students play a board game in small groups to learn about events that occur in each stage of the humpback whale life cycle, including natural and human-caused threats. Students write a creative story about the life and times of a humpback whale as the culminating experience for the unit.

Lesson Duration

Two 45-minute periods

Essential Question(s)

What major events occur during each stage of a humpback whale's life cycle?
How is whale survival impacted by natural and human activities?

Key Concepts

- Humpback whales experience significant events as they develop during the calf, yearling, sub adult and mature adult stages of life.
- Predators and parasites are natural threats that can affect the survival of humpback whales in the marine environment.
- Human activities in the marine environment can have a negative impact on the survival of humpback whales.

Instructional Objectives

- I can describe the behaviors of humpback whales in the marine environment at each stage of life.
- I can describe how technology and human activities in the marine environment have a negative impact on the survival of humpback whales.
- I can describe natural impacts on the survival of humpback whales.
- I can compare and contrast the lives of humpback whales and humans.

Related HCPSIII Benchmark(s):

Science SC 4.3.2
Describe how an organism's behavior is determined by its environment.

Science SC.4.2.1
Describe how the use of technology has influenced the economy, demography, and environment of Hawai'i.

Language Arts LA.4.4.1
Write in a variety of grade-appropriate formats for a variety of purposes and audiences.



Assessment Tools

Benchmark Rubric

Topic		Science, Technology, and Society	
Benchmark SC.4.2.1		Describe how the use of technology has influenced the economy, demography, and environment of Hawai‘i	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain how the use of technology has influenced the economy, demography, and environment of Hawai‘i and suggest ways to conserve the environment	Describe how the use of technology has influenced the economy, demography, and environment of Hawai‘i	Give examples of how the use of technology has influenced the economy, demography, and environment of Hawai‘i	Recognize that the use of technology has influenced the economy, demography, and environment of Hawai‘i
Topic		Interdependence	
Benchmark SC.4.3.2		Describe how an organism’s behavior is determined by its environment	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain and give examples of how different organisms’ behaviors are determined by their environments	Describe how an organism’s behavior is determined by its environment	Identify a way that an organism’s behavior is influenced by its environment	Recognize that an organism’s behavior is influenced by its environment
Topic		Range of Writing	
Benchmark LA.4.4.1		Write in a variety of grade-appropriate formats for a variety of purposes and audiences, such as: <ul style="list-style-type: none"> • narratives that follow a plot and describe a setting and characters • poems that provide insight into why the topic is memorable • responses to literature • reports that focus on a central question and incorporate summaries from research • accounts based on personal experience that have a clear focus and supporting details • pieces to reflect on learning and to solve problems 	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Insightfully adapt writing to grade-appropriate formats for a variety of purposes and audiences	Adapt writing to grade-appropriate formats for a variety of purposes and audiences	Write with some adaptation to grade-appropriate formats for a variety of purposes and audiences	Write with little adaptation to grade-appropriate formats for a variety of purposes and audiences

Assessment/Evidence Pieces

Lesson

- Creative Writing: Unit Assessment

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • <i>The Life and Times of Humpback Whales</i> Game Board • <i>The Life and Times of Humpback Whale</i> Game Rules • <i>The Life and Times of Humpback Whales</i> Game Pieces • <i>The Life and Times of Humpback Whales</i> Game Cards (2–3 sets) • One die 	<ul style="list-style-type: none"> • <i>Field Notebook</i> worksheet • <i>The Life and Times of a Humpback Whale</i> Story Checklist • Materials for illustration • Drawing paper • Optional: <i>Humpback Whale</i> Images

Instructional Resources

Teacher Reading: *Game Details*

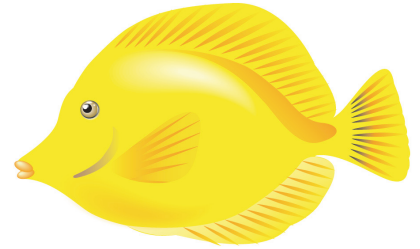
Teacher Reading: *The Life and Times of Humpback Whales* Game Rules

Student Worksheet: *Story Checklist*

Student Worksheet: *Field Notebook*

Video: *Whale Migration and Shipping Routes*

The Life and Times of the Humpback Whale Game (included with this unit)



Student Vocabulary Words

barnacle: a marine crustacean with a hard shell that attaches to surfaces under water, including the rostrum, lower jaw, pectoral fins, and flukes of humpback whales.

behavior: the actions or reactions of an organism in response to external or internal stimuli.

calf: the juvenile stage of an animal; from 0-1 years old for whale calves.

competition pod: a group of male whales competing to mate with a female whale.

escort: a male whale swimming close to a female whale in the breeding grounds.

hemispherical lobe: a small bump on the posterior edge of a female humpback whale's genital opening.

sub adult: the life stage of a humpback whale from years 2-5 before reaching sexual maturation.

whale lice: small parasitic crustaceans that live on whales and feed on their skin.

yearling: term used to describe animals that are only a few years old; 1-2 years old for whale yearlings.

Lesson Plan

Lesson Preparation

- Review the Science Background in the Unit Overview.
- Make copies of *The Life and Times of Humpback Whales* Game Board onto 11 in. x 17 in. paper or two pieces of 8- in.x11-in. paper (one per group of 2–4 students). Glue each Game Board to the inside of a manila file folder. You can have each group of students color parts of their game board the day before the lesson. You may want to laminate the game boards before attaching to the file folders.
- Make copies of *The Life and Times of Humpback Whale* Game Rules (one per group of 2–4 students). Laminate the Game Rules (if desired) and attach one copy to the outside flap of each file folder.
- Make copies of *The Life and Times of Humpback Whales* Game Pieces onto card stock (one per group of 2–4 students). Cut out the Game Pieces along the solid lines. You can have the students personalize their game piece the day before the lesson: have the students color the game piece, choose a name for their whale, and write the name on the game piece. To make the game pieces stand up, fold along the dotted lines and glue or tape the bottom flaps together so they overlap.
- Make copies of *The Life and Times of Humpback Whales* Game Cards (2–3 sets of cards for each life stage

per group) onto card stock and laminate (if desired). Cut out the game cards and sort into separate piles for each life stage. Each group should have the same sets of game cards. You can copy the Calf, Yearling, Sub Adult Female, and Sub Adult Male cards onto different colors of card stock to make them easier for the students to distinguish.

- Assemble the Game Sets (one per group). Each set should include a copy of the Game Board, Game Rules, Game Pieces, and 2–3 sets of Game Cards for each life stage.
- Make copies of *Field Notebook* student worksheet (one per student).
- Make copies of *The Life and Times of a Humpback Whale Story Checklist* (one per student).

I. *Playing the Game*

- Introduce the lesson by engaging the students in a brief discussion about the life stages of humans. Have the students describe some events that occur during the infancy, childhood, adolescence, and adulthood life stages. Ask the students if they think humpback whales go through the same stages.
- Explain to the students that they will learn about events that occur in each stage in the life of humpback whales by playing a board game in small groups.
- Divide the students into groups of 2–4 and provide each group with a copy of *The Life and Times of Humpback Whales* game set.
- Carefully review the Game Rules with the students. Remind students that the object of the game is to grow from a calf > yearling > sub adult > mature adult whale by collecting 10 energy points during each life stage. Each life stage is represented by a path in the shape of a circle on the game board. Students are to begin the game in the small circle (calf life stage) in the center of the game board. Have the students place their game pieces on the game board in the center near the image of the Hawaiian Islands.
- Provide each student with a copy of the *Field Notebook* page. Have the students fill in the information at the top of the page (name, date, name, and gender of their whale).
- Explain to students that during the game, they will collect game cards describing facts and events that happen during each stage of a whale's life. Tell the students to make a pile of cards they collect for each life stage in the appropriate area on the Field Notebook page. If they draw the same card twice, have them place the card on the bottom of the pile and redraw.
- Tell the students that each card also gives or takes away points. Explain that the *Card Number* column represents the order of the cards they draw during each life stage and they must add or subtract the points for each card and *record the result* in the *Total Energy Points* column. You may need to review how to tally negative numbers with the students.
- Tell the students they can also gain or lose points when landing on a Bonus or Danger space. Remind them that they do not draw a card when landing on a Bonus or Danger space.
- Remind the students to keep track of their total energy points. They can jump to the next circle (life stage) once they have collected 10 points. They may need to go around each circle more than once before collecting 10 points. They begin each life stage on the space labeled *START HERE*.
- Provide each group with dice, and tell them to begin the game.
- Assist each group as needed.

II. *Post Game Discussion*

- Engage the students in a discussion about the game. Here are some suggestions for questions to help facilitate the discussion:
 - *What are the four life stages of humpback whales?* Calf (0–1 years), yearling (1–2 years), sub adult (2–5 years), and mature adult (whales are sexually mature around 5 years old, and reach full maturity at 13–18 years old).
 - *What are some facts you found interesting as you learned about each humpback whale life stage?* Accept any valid fact.
 - *What life stage was the most challenging for you to collect the 10 energy points? Why do you think it was so difficult?* It should be more challenging for the students to collect 10 points during the calf life stage, when a whale is most vulnerable to predation and disease. A calf is also more threatened by many human activities in the marine environment because it surfaces more frequently than larger whales.
 - *What events harmed humpback whales during each life stage?* Predators, parasites, and threats caused by the activities of people in the marine environment can harm whales during all life stages. Calves are more susceptible to these threats when left unprotected at the surface. Calves and young males can be injured and occasionally killed during violent competition between large adult males.
 - *What harmful events were natural?* The most frequently cited predators are killer whales, which hunt in northern regions where humpbacks feed. Killer whales are capable of capturing mature adults as well as younger whales. Tiger sharks are the main predators of humpback whales in Hawai'i, but typically only attack sick or injured whales, or calves left unprotected near the surface. Parasites, such as whale lice, are not a severe health threat, but can cause discomfort. Whales are also threatened during violent competition between males during breeding season.

- *What harmful events were caused by the activities of people?* The greatest threats to humpback whales are ship strikes and entanglement in fishing gear. (Suggestion: show students the data visualization of the humpback whale migration routes superimposed over the global shipping channels. This can be found on the PowerPoint *Whale Migration and Shipping Routes*.) Whales are also threatened by underwater noise pollution, such as low-frequency sonar used by the military to detect submarines. Although the International Whaling Commission signed a Moratorium on Commercial Whaling in 1986, whales are still hunted illegally by some countries. Whale meat is considered a delicacy due to the illegal status, and can be found for sale on the black market. A certain number of whales per year can also be taken legally by Native American tribes to maintain cultural practices, and by scientists for research purposes. Historically, humpback whales were hunted for their blubber, meat, and baleen. Blubber was boiled down into oil to light lamps and to make candles and soap. Baleen was made into corset stays, carriage springs, and ribs in umbrellas because it is very strong and flexible. About 95% of all humpback whale populations were killed due to commercial whaling. The North Pacific humpback whale pre-exploitation population was estimated at 15,000 individuals. In the 1960's, the post-whaling population was estimated at 1,200–1,400 individuals.
 - *How can people help protect humpback whales?* Whales are currently protected by law through the Marine Mammal Protection Act of 1972, and the Endangered Species Act of 1973. Humpbacks that migrate to Hawai'i are protected in the Hawaiian Island Humpback Whale National Marine Sanctuary (HIHWNMS) from Dec. 15–May 15. During these months, boaters are encouraged to travel at slower speeds, and fast-moving recreational vessels, such as jet skis and speedboats, are not allowed to operate within the Sanctuary boundaries. (Jet skis are allowed for life guarding purposes.) Within the sanctuary boundaries, humpback whales may not be approached (by boat or otherwise) closer than 100 yards.
 - *How are the lives of male and female humpback whales different?* Female humpback whales grow larger than males probably due to the high-energy requirements of pregnancy, giving birth, and caring for the young.
 - *How are the lives of humpback whales similar to the lives of humans? How are they different?* Whales give birth and nurse their young similar to humans. The gestation for whales is 1–2 months longer, and calves are fully functional at birth. Calves learn behaviors from their mothers similar to humans. Calves form strong bonds with their mothers. Mother and calf separate after 1 to 1 ½ years. Males and females become sexually mature at age 5 and full grown at age 13–18. Females mate with several males during breeding season, and the males do not participate in parenting. Whales live to be approximately 50 years old.
- B. Tell the students that in reality, many humpback whale calves, yearlings, and sub adults die before reaching adulthood, even though no whales died during the game. Make sure they understand that humpback whale mortality is probably greatest during the calf life stage when the whales are the most vulnerable to disease and predation. Scientists estimate that about 20% of humpback whale calves die before they are weaned.

III. *Creative Writing: Unit Assessment*

- A. Assess student understanding of the concepts taught about humpback whales within the unit by engaging them in a creative writing activity.
- B. Explain that researchers study whales by recording their observations of the activities and behaviors of whales in a field notebook. They can pretend the information on the game cards they collected during the game are their observations of humpback whales in the wild. They can use these *observations* to help them write a creative story about a humpback whale.
- C. Provide each student with a copy of *The Life and Times of a Humpback Whale Story Checklist*. Review the activity instructions and checklist with the students.
- D. Tell the students they must include all the concepts on the Storyboard Checklist to tell a story describing *The Life and Times of a Humpback Whale*. They can write their stories from the perspective of a whale researcher (similar to a documentary), or from the perspective of a whale. Ask the students to be creative.
- E. Have the students make an illustration of their favorite part of their story.
- F. Have the students share their stories and illustrations orally, and hang their illustrations on the wall around the room.

Extended Activities

- Have students draw, color, and cut out natural and human-caused threats, and add them to the Whale Wall Mural.
- For reinforcement, play a similar game online at http://sanctuaries.noaa.gov/whales/main_page.html

CULMINATING LESSON Story Checklist

Name _____ Date _____

Instructions:

1. Write a creative story about the life and times of a humpback whale. Choose how you would like to write your story:
 - a. From the perspective of a whale (YOU are the whale.)
 - b. From the perspective of a whale researcher (YOU are the whale researcher writing a documentary.)

2. My creative story includes descriptions of the following behaviors and information about humpback whales: (choose 3 to 5 behaviors)
 - Each stage in a whale's life
 - The Alaska and Hawai'i environments
 - Migration
 - Activities in Hawai'i (birth and mating)
 - Whale song
 - Research methods and tools that help scientists study whales
 - Natural and human-caused threats
 - Two or more ways people can help protect whales

3. My creative story includes:
 - A good, creative title
 - A nice illustration of my favorite part of the story

CULMINATING LESSON **Teacher Reading**

Game Details

Calf Facts (+32 total)

1. (+2) A female whale is pregnant for 11-12 months before giving birth to her calf in Hawai'i.
2. (+2) Calves are born tail first near the surface in warm, shallow water in Hawai'i during the winter. They can already swim well.
3. (+2) A calf is 12-15 feet long and weighs about 3,000 pounds at birth.
4. (+2) A newborn calf is light gray. This light color helps it blend in with the light at the surface of the water.
5. (+2) A calf stays just above, and to one side of its mother's head while they are swimming. This way they can always see each other.
6. (+3) A calf nurses rich milk from its mother. The mother squirts the milk into the calf's open mouth.
7. (+2) A calf must hold its breath while nursing.
8. (+3) Humpback milk is 50 % fat and thick like cottage cheese. This helps the calf build a thick blubber layer to keep it warm in cold water.
9. (+3) A calf nurses 80-100 gallons of milk each day. It gains about 100 pounds each day.
10. (+2) A calf surfaces to breathe every 3-5 minutes.
11. (+2) Calves are born during the winter in the warm waters of Hawai'i. They are born without a thick blubber layer, and would freeze if born in Alaska.
12. (+2) A calf will start to eat solid food (fish and krill) when 6-9 months old. It will still nurse milk from Mom until it is one year old.
13. (-2) About 20 % (one out of every five) of humpback calves die from natural or human-caused threats.
14. (+3) Calves stay with their mother until they are about one year old.



CULMINATING LESSON

Teacher Reading Continued

Calf Events (+3, -12, or +4,-11)

1. (+1) You learn how to breach and make a big splash. Calves mimic their mothers' behaviors in Hawai'i to make their tail muscles strong for the long swim to Alaska. Take an extra turn, and add 1 energy point.
2. (+3) You are 10 months old and have learned how to gulp feed on schools of small fish in the cold Alaska water. Take an extra turn, and add 3 energy points.
3. (- 1) You wander away from your mother to check out a whale watching boat. It takes her a few minutes to find you. Lose a turn, and 1 energy point.
4. (- 1) Six males in a competition pod chase after your mother to mate with her. You become tired trying to keep up with her. Lose a turn, and 1 energy point.
5. (- 2) A tiger shark tries to attack you in Hawai'i. Your large mother swims between you and the shark to protect you. Lose a turn, and 2 energy points.
6. (- 2) You become tired when a pod of killer whales chases you and your mother near the Alaska feeding grounds. Lose a turn, and 2 energy points.
7. (- 2) It is spring, and you use up energy migrating 3,500 miles from Hawai'i to Alaska with your mother. Lose a turn, and 2 energy points.
8. (- 1) Two large males are competing to mate with your mother. You get injured when one male tries to slap the other with his giant tail flukes. Lose a turn, and 1 energy point.
9. (- 1) Your mother dives deep underwater to mate with her escort. You get scared while alone at the surface. Lose a turn, and 1 energy point.
10. (- 1) You get caught in a tangle of old fishing line. It takes researchers 2 hours to remove the line from your fins. Lose a turn and 1 energy point.



CULMINATING LESSON

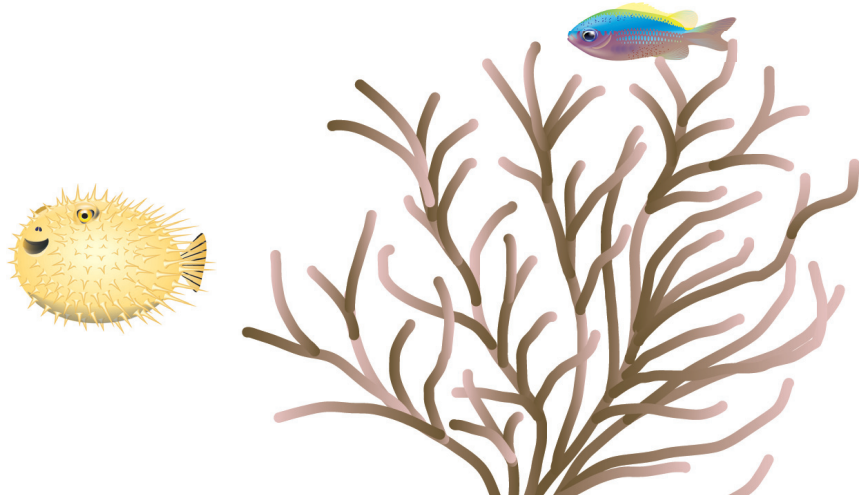
Teacher Reading Continued

Yearling Facts (+8 total)

1. (+2) Whales do not sleep. They float near the surface and shut down part of their brain to rest. They must stay alert to breathe and look out for danger. Add 2 energy points.
2. (+2) A one-year old humpback whale is 29 feet long and weighs about 24,000 pounds. Add 2 energy points.
3. (+2) Young whales are called yearlings after they turn one year old. Add 2 energy points.
4. (+1) A male whale is called a bull. Add 1 energy point.
5. (+1) A female whale is called a cow. Add 1 energy point.

Yearling Events

1. (+4) It is summer and you learn how to bubble net feed with other humpbacks in Alaska. This lets you eat tons of fish using less energy. Take an extra turn, and add 4 energy points.
2. (+3) Researchers take a picture of your flukes before you dive. Now they will be able to recognize you later and learn more about your life. Take an extra turn, and add 3 energy points.
3. (-4) It is spring and you begin your first migration to Alaska alone. You are hit by a cargo ship while surfacing to breathe. Lose 2 turns, and 4 energy points.
4. (-3) You spend your first winter in Hawai'i without food. You have to wait until you migrate back to Alaska to eat. Lose one turn, and 3 energy points.
5. (-2) It is fall and you follow your mother as she leaves Alaska. When you reach Hawai'i she will separate from you. Lose one turn, and 2 energy points.
6. (-2) You are over one year old, and have left your mother. You use more energy taking care of yourself. Lose 2 energy points.
7. (-1) You are covered in whale lice parasites that are eating your dead skin and making you itchy. Lose 1 energy point.



CULMINATING LESSON

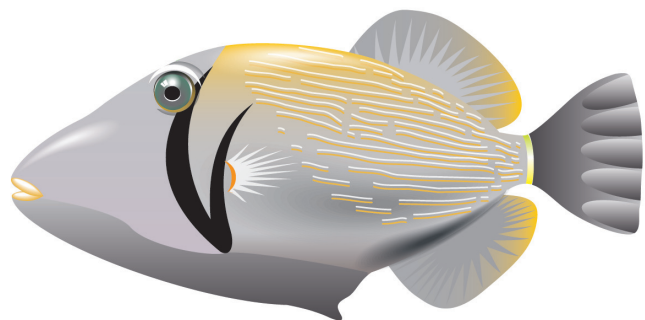
Teacher Reading Continued

Sub Adult Female Facts

1. (+1) Female humpbacks have a small bump (hemispherical lobe) on the lower stomach area. Add 1 energy point.
2. (+2) Mature females are 45-50 feet long, and can weigh over 90,000 pounds. Add 2 energy points.
3. (+2) Adult females are larger than males. They need extra size for more energy to give birth and care for calves. Add 2 energy points.
4. (+2) Sub adults are 2-4 years old. They are not old enough to mate. Add 2 energy points.
5. (+2) Female humpback whales can give birth to their first calf when they are 5 years old. They are fully grown at age 15. Add 2 energy points.

Events

1. (+2) It is fall, and others have migrated to Hawai'i. You are 3 years old, not old enough to mate. You decide to stay in Alaska where there is plenty of food. Add 2 energy points.
2. (+3) You are happy to reach the Hawaiian Islands Humpback Whale Sanctuary where you are protected by law. Take an extra turn and add 3 energy points.
3. (+3) You are 5 years old and able to mate. You get to choose your mate and will get pregnant every 2-3 years by different mates. Take an extra turn, and add 3 energy points.
4. (-3) You are pregnant. You must swim 3,500 miles to Hawai'i, give birth, nurse and care for your calf, then migrate back to Alaska before you can eat again. Lose 3 energy points.
5. (-3) You are migrating to Alaska and hear a very loud noise. You get confused and swim up a river. It takes two weeks to find your way out. Lose a turn, and 3 energy points.
6. (-3) It takes you 30-40 days to migrate from Alaska to Hawai'i. Lose a turn, and 3 energy points.
7. (-4) You and your calf are struck by a ship while resting at the surface. You are injured and not sure that your calf will survive. Lose 2 turns, and 4 energy points.



CULMINATING LESSON

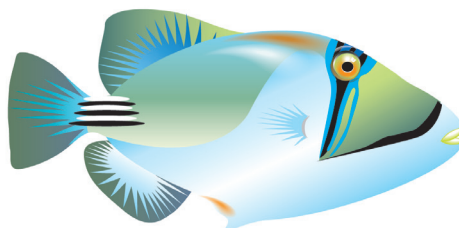
Teacher Reading Continued

Sub Adult Male Facts

1. (+2) A mature male is 40-45 feet long, and weighs about 90,000 pounds. Add 2 energy points.
2. (+2) Adult males are about 3-5 feet smaller than adult females. Add 2 energy points.
3. (+2) Male humpback whales are able to mate when 5 years old. They are fully grown at age 15. Add 2 energy points.
4. (+1) Humpback whales live to be about 50 years old. Add 1 energy point.

Events

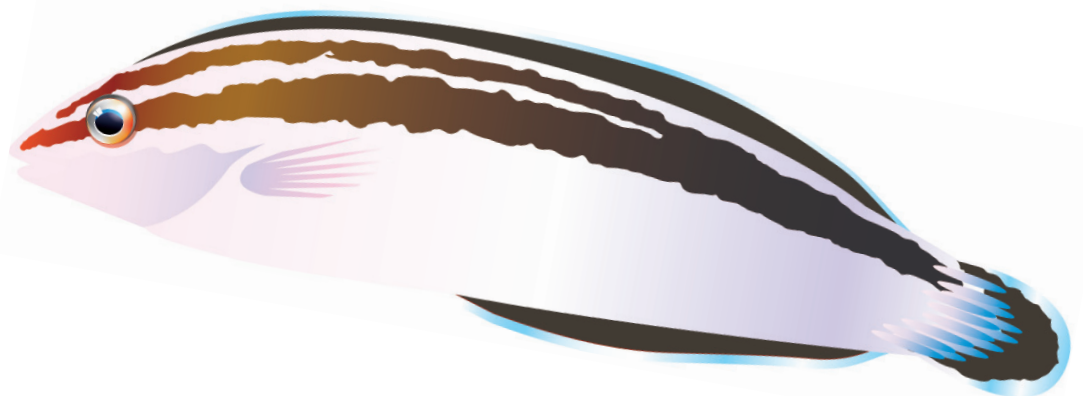
1. (+4) You and some other young males are the first whales to reach Hawai'i for mating season. Take an extra turn, and add 4 energy points.
2. (+3) You are in Hawai'i and can hear other males singing. You dive down and join in on the song. Add 3 energy points.
3. (+1) You are 15 years old and large enough to compete for females. You will mate with several females each season. Add 1 energy point.
4. (-3) A killer whale attacks you while you are searching for food in Alaska. It bites your flukes before you can escape. Lose 2 turns, and 3 energy points.
5. (-3) A Japanese whaleboat tries to shoot you with a harpoon. It barely misses your back as you surface to breathe. Lose 1 turn, and 3 energy points.
6. (-2) You join a competition pod, but are too small to compete with the larger males. You swim away. Lose one turn, and 2 energy points.
7. (-2) While escorting a female in Hawai'i, you are challenged by a larger male. He head lunges and scrapes you with barnacles on his chin. Lose 2 energy points.
8. (-4) You get tangled in an abandoned fishing net, and are unable to swim or feed. It takes weeks to free yourself. Lose 2 turns, and 4 energy points.



CULMINATING LESSON **Teacher Reading**

The Life and Times of Humpback Whales Game Rules

- Sort the game cards into piles with the information side facing down. There should be four piles, one for each stage of life: Calf, Yearling, Female Sub Adult, and Male Sub Adult.
- Shuffle each pile of cards and place them face down in the spaces marked on the game board.
- Each player should choose a whale playing piece (or color and name your own), and place it in the Hawaiian Islands next to the mother whale in the center of the game board.
- You need 2–4 players to play the game. At least one player must be a female whale, and one must be a male whale.
- To begin the game, have each player roll the dice. The player who rolls the highest number goes first, then passes the dice to the player on his/her left.
- The object of the game is to be the first whale to grow from a calf to a mature adult. You must move through the small circle in the center (Calf stage), to the middle circle (Yearling stage), and finally through the large outer circle (Sub Adult stage). After that, you will be a mature adult whale.
- For each turn, roll the dice, and move your whale the number of spaces shown on the dice. Count the START HERE space as the first space. Move through each circle (life stage) in the direction of the flukes. More than one whale can share the same space.
- When you land on a plain fluke, draw a card from the pile that matches your stage of life. When you get to the Sub Adult stage, remember to choose a card for the correct gender (male or female) of your whale.
- When you draw a card, read it aloud to the rest of your group, and follow any instructions on the card. Do not return the card to the stack. Place the card in the correct column of your Field Notebook, and record the total number of energy points you have at the end of each turn. You will add or subtract points from the Total Energy Points column for each card. If you draw the same card twice, place the card at the bottom of the pile, and redraw.
- When you land on a Bonus or Danger space, do not draw a card. Include the points in your energy point total for that turn. (No card number.)
- To move from one circle (life stage) to the next, you need to collect 10 energy points in each stage. If you move around the entire circle and have not collected 10 points, move through the circle again until you have collected 10 total energy points.
- After you have collected 10 energy points during one life stage, jump to the next life stage circle on your next turn. Count the START HERE space as the first space of the next life stage circle, and move in the direction of the arrows.
- You need 30 total energy points (10 points from each life stage) to become a mature adult whale. The first player to collect 10 energy points from each life stage and becomes a mature adult wins the game.



CULMINATING LESSON Field Notebook

Name _____

My Whale's Name _____ Date _____

My Whale is: male / female (*circle one*)



CALF
PLACE CARDS HERE



YEARLING
PLACE CARDS HERE



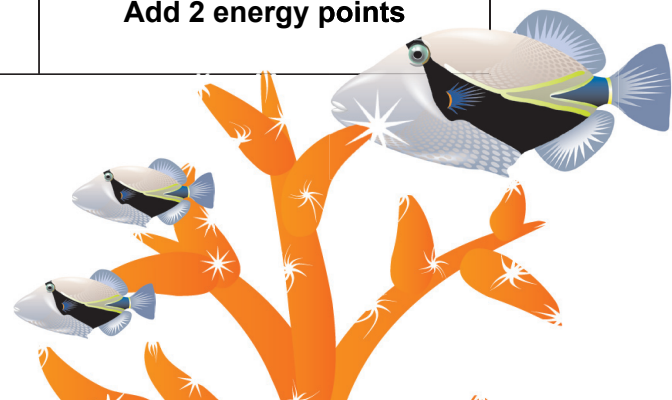
SUB ADULT
PLACE CARDS HERE

Card Number	Total Energy Points
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Card Number	Total Energy Points
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Card Number	Total Energy Points
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

<p>CALF -1 EVENT</p> <p>Males in a comp pod chase after your mother to mate with her. You get tired trying to keep up with her.</p> <p>Lose a turn, and 1 energy point</p>	<p>CALF +2 FACT</p> <p>A calf is 12–15 feet long and weighs about 3,000 pounds at birth.</p> <p>Add 2 energy points</p>	<p>CALF +2 FACT</p> <p>A female whale is pregnant for 11–12 months before giving birth to her calf in Hawai‘i.</p> <p>Add 2 energy points</p>
<p>CALF +2 FACT</p> <p>A calf stays just above, and to one side of its mother’s head while they are swimming. This way they can always see each other.</p> <p>Add 2 energy points</p>	<p>CALF -2 FACT</p> <p>About 20 % (one out of every five) of humpback calves die from natural or human-caused threats.</p> <p>Lose a turn, and add 2 energy points</p>	<p>CALF +1 EVENT</p> <p>You breach and make a big splash. Calves mimic their mothers’ behaviors to make their tail muscles strong.</p> <p>Take an extra turn, and add 1 energy point</p>
<p>CALF +2 FACT</p> <p>A calf will start to eat solid food (fish and krill) when 6–9 months old. It will still nurse milk from Mom until it is one year old.</p> <p>Add 2 energy points</p>	<p>CALF +2 FACT</p> <p>A newborn calf is light gray. This light color helps it blend in with the light at the surface of the water.</p> <p>Add 2 energy points</p>	<p>CALF +3 EVENT</p> <p>You are 10 months old and have learned how to gulp feed on schools of small fish in the cold Alaska water.</p> <p>Take an extra turn, and add 3 energy point^s</p>
<p>CALF -2 EVENT</p> <p>A tiger shark tries to attack you in Hawai‘i. Your large mother swims between you and the shark to protect you.</p> <p>Lose a turn, and 2 energy points</p>	<p>CALF -1 EVENT</p> <p>You wander away from your mother to check out a whale watching boat.</p> <p>Lose a turn, and 1 energy point</p>	<p>CALF +2 FACT</p> <p>Calves are born tail first near the surface in warm, shallow water in Hawai‘i during the winter. They can already swim well.</p> <p>Add 2 energy points</p>



<p>CALF -1 EVENT</p> <p>Your mother dives deep underwater to mate with her escort. You get scared while alone at the surface.</p> <p>Lose a turn, and 1 energy point</p>	<p>CALF +3 FACT</p> <p>Calves stay with their mother until they are about one year old.</p> <p>Add 3 energy points</p>	<p>CALF +3 FACT</p> <p>A calf nurses rich milk from its mother. The mother squirts the milk into the calf's open mouth.</p> <p>Add 3 energy points</p>
<p>CALF -1 EVENT</p> <p>You get caught in a tangle of old fishing line. It takes researchers 2 hours to remove the line from your fins.</p> <p>Lose a turn, and 1 energy point</p>	<p>CALF +2 FACT</p> <p>A calf must hold its breath while nursing.</p> <p>Add 2 energy points</p>	<p>CALF -2 EVENT</p> <p>You become tired when a pod of killer whales chases you and your mother near the Alaska feeding grounds</p> <p>Lose a turn, and 2 energy points</p>
<p>CALF +3 FACT</p> <p>Humpback milk is 50 % fat and thick like cottage cheese. This helps the calf build a thick blubber layer to keep it warm in cold water.</p> <p>Add 3 energy points</p>	<p>CALF +2 FACT</p> <p>A calf surfaces to breathe every 3–5 minutes.</p> <p>Add 2 energy points</p>	<p>CALF -2 EVENT</p> <p>It is spring, and you use up energy migrating 3,500 miles from Hawai'i to Alaska with your mother.</p> <p>Lose a turn, and 2 energy points</p>
<p>CALF +2 FACT</p> <p>Calves are born during winter in the warm waters of Hawai'i. They are born without a thick blubber layer and would freeze if born in Alaska.</p> <p>Add 2 energy points</p>	<p>CALF -1 EVENT</p> <p>Two large males are competing to mate with your mother. You get injured when one male tries to slap the other with his giant tail flukes.</p> <p>Lose a turn, and 1 energy point</p>	<p>CALF +3 FACT</p> <p>A calf nurses 80–100 gallons of milk each day. It gains about 100 pounds each day.</p> <p>Take an extra turn, and add 3 energy points</p>

<p>YEARLING -3 EVENT</p> <p>You spend your first winter in Hawai'i without food. You have to wait until you migrate back to Alaska to eat.</p> <p>Lose one turn, and 3 energy points</p>	<p>YEARLING +2 FACT</p> <p>Young whales are called yearlings after they turn one year old.</p> <p>Add 2 energy points</p>	<p>YEARLING +2 FACT</p> <p>Whales do not sleep. They float near the surface and shut down part of their brain to rest. They must stay alert to breathe & look out for danger.</p> <p>Add 2 energy points</p>
<p>YEARLING -2 EVENT</p> <p>It is fall, and you follow your mother as she leaves Alaska. When you reach Hawai'i she will separate from you.</p> <p>Lose one turn, and 2 energy points</p>	<p>YEARLING +1 FACT</p> <p>A male whale is called a bull.</p> <p>Add 1 energy point</p>	<p>YEARLING +4 EVENT</p> <p>Its summer and you learn how to bubble-net feed with other whales in Alaska. This lets you eat tons of fish using</p>
<p>YEARLING -2 EVENT</p> <p>You are over one year old and have left your mother. You use more energy taking care of yourself.</p> <p>Lose 2 energy points</p>	<p>YEARLING +1 FACT</p> <p>A female whale is called a cow.</p> <p>Add 1 energy point</p>	<p>YEARLING +3 EVENT</p> <p>Researchers take a picture of your flukes before you dive. Now they will be able to recognize you later and learn about your life.</p> <p>Take an extra turn, and add 3 energy points</p>
<p>YEARLING -1 EVENT</p> <p>You are covered in whale lice parasites that are eating your dead skin and making you itchy.</p> <p>Lose 1 energy point</p>	<p>YEARLING -4 EVENT</p> <p>It is spring, and you begin your first migration to Alaska alone. You are hit by a cargo ship while surfacing to</p>	<p>YEARLING +2 FACT</p> <p>A one-year old humpback whale is 29 feet long and weighs about 24,000 pounds.</p> <p>Add 2 energy points</p>

<p>SUB ADULT FEMALE -3 EVENT</p> <p>You are pregnant. You must swim 3,500 miles to Hawai‘i, give birth, nurse & care for your calf, then migrate back to Alaska</p>	<p>SUB ADULT FEMALE +2 FACT</p> <p>Adult females are larger than males. They need extra size for more energy to give birth and care for calves.</p> <p>Add 2 energy points</p>	<p>SUB ADULT FEMALE +1 FACT</p> <p>Female humpbacks have a small bump (hemispherical lobe) on the lower stomach area.</p> <p>Add 1 energy point</p>
<p>SUB ADULT FEMALE -3 EVENT</p> <p>You’re migrating to Alaska and hear a loud noise. You get confused and swim up a river. It takes 2 weeks to find your way out.</p> <p>Lose a turn, and 3 energy points</p>	<p>SUB ADULT FEMALE +2 FACT</p> <p>Sub adults are 2–4 years old. They are not old enough to mate.</p> <p>Add 2 energy points</p>	<p>SUB ADULT FEMALE +2 FACT</p> <p>It is fall, and others have migrated to Hawai‘i. You are 3 years old, not old enough to mate. You decide to stay in Alaska where there is plenty of food.</p> <p>Add 2 energy points</p>
<p>SUB ADULT FEMALE -3 EVENT</p> <p>It takes you 30–40 days to migrate from Alaska to Hawai‘i.</p> <p>Lose a turn, and 3 energy points</p>	<p>SUB ADULT FEMALE +2 FACT</p> <p>Female humpback whales can give birth to their first calf when they are 5 years old. They are fully grown at age 15.</p> <p>Add 2 energy points</p>	<p>SUB ADULT FEMALE +3 EVENT</p> <p>You are happy to reach the Hawaiian Islands Humpback Whale Sanctuary where you are protected by law.</p> <p>Take an extra turn, and add 3 energy points</p>
<p>SUB ADULT FEMALE -4 EVENT</p> <p>You and your calf are struck by a ship while resting at the surface. You are injured and not sure that your calf will survive.</p> <p>Lose 2 turns, and 4 energy points</p>	<p>SUB ADULT FEMALE +3 EVENT</p> <p>You are 5 years old & able to mate. You get to choose your mate and will get pregnant every 2–3 years by different</p>	<p>SUB ADULT FEMALE +2 FACT</p> <p>Mature females are 45–50 feet long and can weigh over 90,000 pounds.</p> <p>Add 2 energy points</p>

<p>SUB ADULT MALE -3 EVENT</p> <p>A Japanese whaleboat tries to shoot you with a harpoon. It barely misses your back as you surface to breathe.</p> <p>Lose 1 turn, and 3 energy points</p>	<p>SUB ADULT MALE +2 FACT</p> <p>Male humpback whales are able to mate when 5 years old. They are fully grown at age 15.</p> <p>Add 2 energy points</p>	<p>SUB ADULT MALE +2 FACT</p> <p>A mature male is 40–45 feet long, and weighs about 90,000 pounds.</p> <p>Add 2 energy points</p>
<p>SUB ADULT MALE -2 EVENT</p> <p>You join a competition pod, but are too small to compete with the larger males. You swim away.</p> <p>Lose one turn, and 2 energy points</p>	<p>SUB ADULT MALE +1 FACT</p> <p>Humpback whales live to be about 50 years old.</p> <p>Add 1 energy point.</p>	<p>SUB ADULT MALE +4 EVENT</p> <p>You and some other young males are the first whales to reach Hawai‘i for the mating season.</p> <p>Take an extra turn, and add 4 energy points</p>
<p>SUB ADULT MALE -2 EVENT</p> <p>While escorting a female in Hawai‘i, you are challenged by a larger male. He head lunges, and scrapes you with barnacles on his chin.</p> <p>Lose 2 energy points</p>	<p>SUB ADULT MALE +1 EVENT</p> <p>You are 15 years old and large enough to compete for females. You will mate with several females each season.</p> <p>Add 1 energy point</p>	<p>SUB ADULT MALE +3 EVENT</p> <p>You are happy to reach the You are in Hawai‘i and can hear other males singing. You dive down and join in on the song.</p> <p>Add 3 energy points</p>
<p>SUB ADULT MALE -4 EVENT</p> <p>You get tangled in an abandoned fishing net, and are unable to swim or feed. It takes weeks to free yourself.</p> <p>Lose 2 turns, and 4 energy points</p>	<p>SUB ADULT MALE -3 EVENT</p> <p>A killer whale attacks you while you are searching for food in Alaska. It bites your flukes before you can escape.</p> <p>Lose 2 turns, and 3 energy points</p>	<p>SUB ADULT MALE +2 FACT</p> <p>Adult males are about 3–5 feet smaller than adult females.</p> <p>Add 2 energy points</p>