



# LESSON 3: THE LIVES OF HUMPBACK WHALES

## INTRODUCTION

Every year, humpback whales make a grand migration. During this journey, the whales travel thousands of miles, communicate with one another and look out for predators. The whales spend summers feeding in the areas around Alaska, Washington and Oregon, then migrate to warmer waters in the winter to breed. Baby whales make these journeys alongside their mothers, meeting many of the milestones of their life. In this lesson, students have an opportunity to explore more about the milestones in a whale's life and compare it to their own development.

## LESSON SUMMARY

In this lesson, students work in small groups to compare the life milestones that are similar and different between humans and humpback whales. They consider that humpback whales travel in pods, and use evidence to explain why this strategy helps the whales survive.

## OBJECTIVES

- Students will explore the milestones in humpback whales' lives and compare them to human milestones.
- Students will describe evidence for why humpback whales might travel in pods.

## ESTIMATED TIME

60 minutes. If you would like to complete this lesson over 2 class periods, consider pausing the lesson between steps 6 and 7.

## STANDARDS ADDRESSED

**Science (NGSS):** 3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

3-LS2-1. Construct an argument that some animals form groups that help members survive.

## **OCEAN LITERACY PRINCIPLES**

5d Ocean biology provides many unique examples of life cycles, adaptations, and important relationships among organisms that do not occur on land.

7b Our survival hinges on understanding the ocean.

7d (with extension) New technologies, sensors, and tools are expanding our ability to explore the ocean.

## **FOCUS QUESTION**

What are the significant events in a humpback whale's life compared to a human's life? How do those events help them survive?

## **MATERIALS**

- Index cards or sticky notes, 3 per group of 4 students

- Whale Milestone card sets, one per group, see “Preparation”
- Human Milestone card sets, one per group, see “Preparation”
- Humpback Whale Pods handout, one per student

## **PREPARATION**

- Make copies of the Whale Milestone card set and the Human Milestone card set so that each group of students has 2 complete sets to use. Consider whether you would like to laminate the card sets so that they may be reused for additional classes of students.
- Cut apart the Whale Milestone card set and the Human Milestone card sets and organize them so that you can provide groups of students with 2 complete sets of cards. Consider making laminated copies of the cards for multiple uses. Originals can also be downloaded at <https://oceanservice.noaa.gov/education/ocean-odyssey/>

## FACILITATION

**Step 1.** Tell students that they are going to have an opportunity to learn about humpback whales and their lives. Share the information from the introduction to this lesson, making the point that baby whales make these long journeys just as adults do. Let students know that in this lesson they will have the opportunity to learn more about the milestones, or significant life events, in a humpback whale's life.

**Step 2.** Ask each group of 4 students to use index cards or sticky notes to make labels for 3 categories. The labels should be "baby," "growing," and "adult."

**Step 3.** Give each group a set of Whale Milestone cards and a set of Human Milestone cards. Tell them that one pair in the group should work with the whale cards and one pair should work with the human cards. Share that the cards show different milestones or life events in human lives and in whale lives, such as a human learning to walk. Have them try to put each card into the correct category to describe when it would happen in a whale or a human life. Students may struggle to know what ages to put into each category. Try to help them reason through the ideas, guiding them to the idea that an animal is a baby while it is drinking its mother's milk, and growing until it reaches its full size.

For the whales, milestones up to a year should be in the baby category and between one and 10 years in the growing category. For humans, up to a year should be "baby" and up to about 18 should be in the growing category.

**Step 4.** Once both pairs in a group have completed their sorting, have them compare the two timelines. Ask them to mark the milestones that appear in both the human and the whale timeline using a check mark or other symbol. Consider having students pair up with another group to check if they sorted the cards in the same way and checked the same milestones. If there are differences, ask them to discuss their ideas and decide if any cards should be moved to a different category.

**Step 5.** Hold a class discussion to talk about the different milestones. Ask students to share what they found interesting or surprising about the humpback whales.

**Step 6.** Ask students which milestones were common between humpback whales and humans. They should realize that both have milestones for birth, growth, reproduction, and death.



**Step 7.** Tell students that they are going to continue thinking about humpback whales. Ask the groups to pull out the cards that have a star in the corner and set the other cards aside. Share that the milestones on these cards are a few things that help the humpback whales to survive. In their groups, ask them to discuss how they think the features listed on the cards with stars help the whales live and survive.

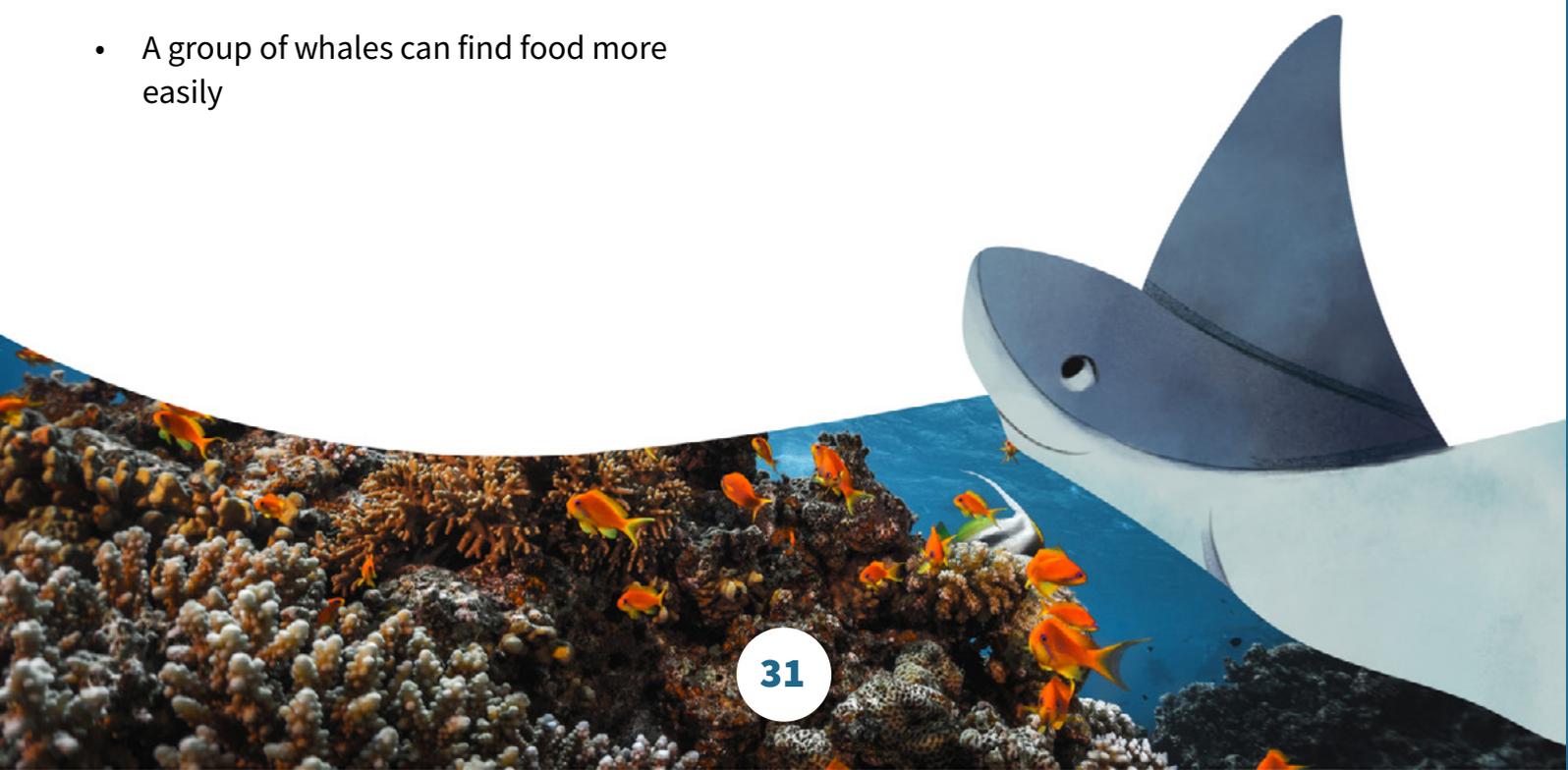
**Step 8.** Once students have had a chance to discuss their ideas, hold a class discussion to help them learn more about the whales and how the starred milestones help them survive. Discuss the migration card last as it is likely to be more challenging for students. For that reason, the remainder of the activity helps them learn more about this survival tactic.

**Step 9.** Ask students to brainstorm as many ideas as they can about why whales might travel in groups or pods. Write their ideas on the board or a chart where students can see them easily. If students have trouble thinking of reasons, share with them some of the ideas that scientists have had. These include

- Whales travel with their families
- A group of whales can find food more easily

- A group of whales can keep predators away more easily because there are more of them
- A group of whales is better able to find their way when traveling 6000 miles or more. Certain whales may serve as leaders.
- A group of whales allows one to look out for predators or other dangers while others sleep
- A male whale can protect a female whale
- Whales communicate with one another in both loud songs and quiet whispers

**Step 10.** Distribute the Humpback Whale Pods handout. Share that the small groups whales travel in are called pods. Ask students to choose one of the ideas from the list you created during the brainstorm that they think might be the reason whales travel in pods. Have them write their idea in the area at the top of the handout.



**Step 11.** Share that the bottom of the handout has several facts about humpback whales. For each one, they should write

- a smiling face if it supports or would serve as evidence for the idea they wrote at the top,
- a frowning face if it would be evidence against the idea at the top, or
- leave the space blank if it is not evidence for or against the idea.

**Step 12.** Once students have had time to work individually, have them talk with a partner or small group about how they completed the handout. Tell students to make sure they understand what their partners chose for their ideas and to ask questions or share any new ideas they have.

**Step 13.** Hold a class discussion about each idea. Tell students that you can rule out ideas that have evidence against the statement. Through the discussion, try to narrow down the ideas to one or two that only have ideas that support them. Share that while we cannot be completely sure, scientists' current understanding is that whales likely travel in pods so others, particularly males, can help protect against predators and to allow for more communication during the long migration.

## EXTENSION

[The Passive Acoustic Cetacean Map](https://apps-nefsc.fisheries.noaa.gov/pacm) (<https://apps-nefsc.fisheries.noaa.gov/pacm>) shows where several kinds of whales, including Humpback whales, have been recently. Listening devices detect when the whales make sounds and show the number of times the whales were heard.





The site offers a tour to use the map, a user guide, and the map itself. Spend some time during class showing students the map and then check back regularly to see how the patterns of where whales are spending their time change.

NOAA's [Ocean Sound and Impact of Noise Resource Collection](https://sanctuaries.noaa.gov/education/teachers/ocean-sound/) (https://sanctuaries.noaa.gov/education/teachers/ocean-sound/) includes background information, lesson plans, videos, webinars, and more to help people learn about sound in the ocean, how animals that live in the ocean use and are impacted by noise, and how NOAA is working to monitor and understand underwater sound.

### Lesson 3 NOAA References

- [Passive Acoustic Cetacean Map](https://apps-nefsc.fisheries.noaa.gov/pacm). 2021. Woods Hole (MA): NOAA Northeast Fisheries Science Center v1.0.6.(https://apps-nefsc.fisheries.noaa.gov/pacm)
- National Marine Sanctuaries [Ocean Sound and Impact of Noise Resource Collection](https://sanctuaries.noaa.gov/education/teachers/ocean-sound/) (https://sanctuaries.noaa.gov/education/teachers/ocean-sound/)

## WHALE MILESTONES

Humpback whales drink milk from their mothers until they are about a year old.



Humpback whales can swim as soon as they are born.

Humpback whales grow until they are about 10 years old.

Humpback whales can have babies once they are about 6 years old.

Humpback whales eat up to 3,000 pounds of food per day.

Humpback whales can be 40-50 feet long, or about the size of 2 school buses.

Humpback whales can weigh up to 80,000 pounds.



Humpback whales “whisper” to their mothers while the pair migrates.



Humpback whales migrate in groups of 2-15 each year.



Humpback whales learn to hunt and eat solid food during their first year of life.

Humpback whales leave their mothers when they are about a year old.

In the wild, humpback whales live to be about 50 years old.

## HUMAN MILESTONES

Humans learn to walk when they are about a year old

Most humans grow to be between 5-7 feet tall.

Humans drink their mother's milk or formula until they are about a year old.

Humans begin losing their "baby teeth" when they are around 5-7 years old.

Humans learn to talk when they are around a year old.

Humans leave their mothers when they are around 18 years old. There is a large range when this can happen.

Humans grow until they are about 18 years old.

Human bodies can begin to have babies in their teenage years. In the United States, the average age for becoming a parent is around age 26.

Humans eat 3-4 pounds of food per day.

In general, humans live to be 70-75 years old.

Adult humans can weigh from around 90 pounds to more than 300 pounds.

Humans begin school around age 5.

## HUMPBACK WHALE PODS

I think humpback whales travel in pods because:

Follow your teacher's instructions on how to fill out the last column.

#	FACTS ABOUT WHALES	  or /
1	Humpback whales travel in groups for only short amounts of time.	
2	Most pods have one male and one female or a mother, baby and male.	
3	All Humpback whales have magnetic material in their brains that help them know where to go when they swim.	
4	A pod may have a mother and baby, but if there are 2 adults in a pod they are not related.	
5	Sometimes scientists have seen Orcas, which are a predator for Humpback whales, following the singing and other noises that whales make.	
6	Humpback whales may rest by floating but do not sleep the way we think of it. They do not rest for more than about 30 minutes at a time because their body temperature drops too much if they stay inactive for longer.	
7	Humpback whales do not generally eat while they are migrating.	