

Ocean Seasons

By Ron Hirschi
Illustrated by Kirsten Carlson



Ocean Seasons

Seasons change in the ocean much as they do on land. Spring brings new plants and baby animals, summer oceans are aglow with sparkly plankton lights, and autumn winds blow across the open water. In winter the humpback whales migrate to warmer waters, just as many land animals move to warmer climates. In fun, fanciful form, children learn about the plants and animals that are joined through the mix of seasons, food webs, and habitats beneath the waves. While this story is set in the Pacific Ocean, similar changes occur all over the world.

It's so much more than a picture book . . . this book is specifically designed to be both a fun-to-read story and a launch pad for discussions and learning. Whether read at home or in a classroom, we encourage adults to do the activities with the young children in their lives. Free online resources and support at www.ArbordalePublishing.com include:

- For Creative Minds as seen in the book (in English & Spanish):
 - A comparison of ocean seasons to land seasons
 - Ocean food web information
 - Ocean food web card game
- Teaching Activities:
 - Reading Questions
 - Language Arts
 - Science
 - Mathematics
 - Geography
 - Coloring Pages
- Interactive Quizzes: Reading Comprehension, For Creative Minds, and Math Word Problems
- English and Spanish Audiobooks
- Related Websites
- Aligned to State Standards (searchable database)
- Accelerated Reader and Reading Counts! Quizzes
- Lexile and Fountas & Pinnell Reading Levels

eBooks with Auto-Flip, Auto-Read, and selectable English and Spanish text and audio available for purchase online.

Thanks to Dr. Thomas C. Eagle, Fishery Biologist, National Marine Fisheries Service, NOAA and Rita Bell, Education Programs Manager at the Monterey Bay Aquarium for verifying the accuracy of the information in this book.

Ron Hirschi lives on a small island in western Washington and walks the beach most days of the year. As a biologist, he also spends much time on the water, learning about and helping salmon and other aquatic fish and wildlife. As an author, he brings the excitement of what he learns onto the pages of books for young readers. Ron has written over 50 children's books. His books have been listed as Best Science Trade Books of the Year and have won the John Burroughs Nature Book Award among others. In addition, several of his books have been featured on Reading Rainbow.

Kirsten Carlson is fascinated by animals and nature. Her background in biology, scientific illustration, and design has given her the tools to share stories about the natural world through art. She believes children's books are a wonderful way to connect others to nature. Prior to *Ocean Seasons*, Kirsten illustrated *The Giraffe Who Was Afraid of Heights*, also published by Arbordale. Kirsten lives in Gig Harbor, Washington near the shores of Puget Sound.



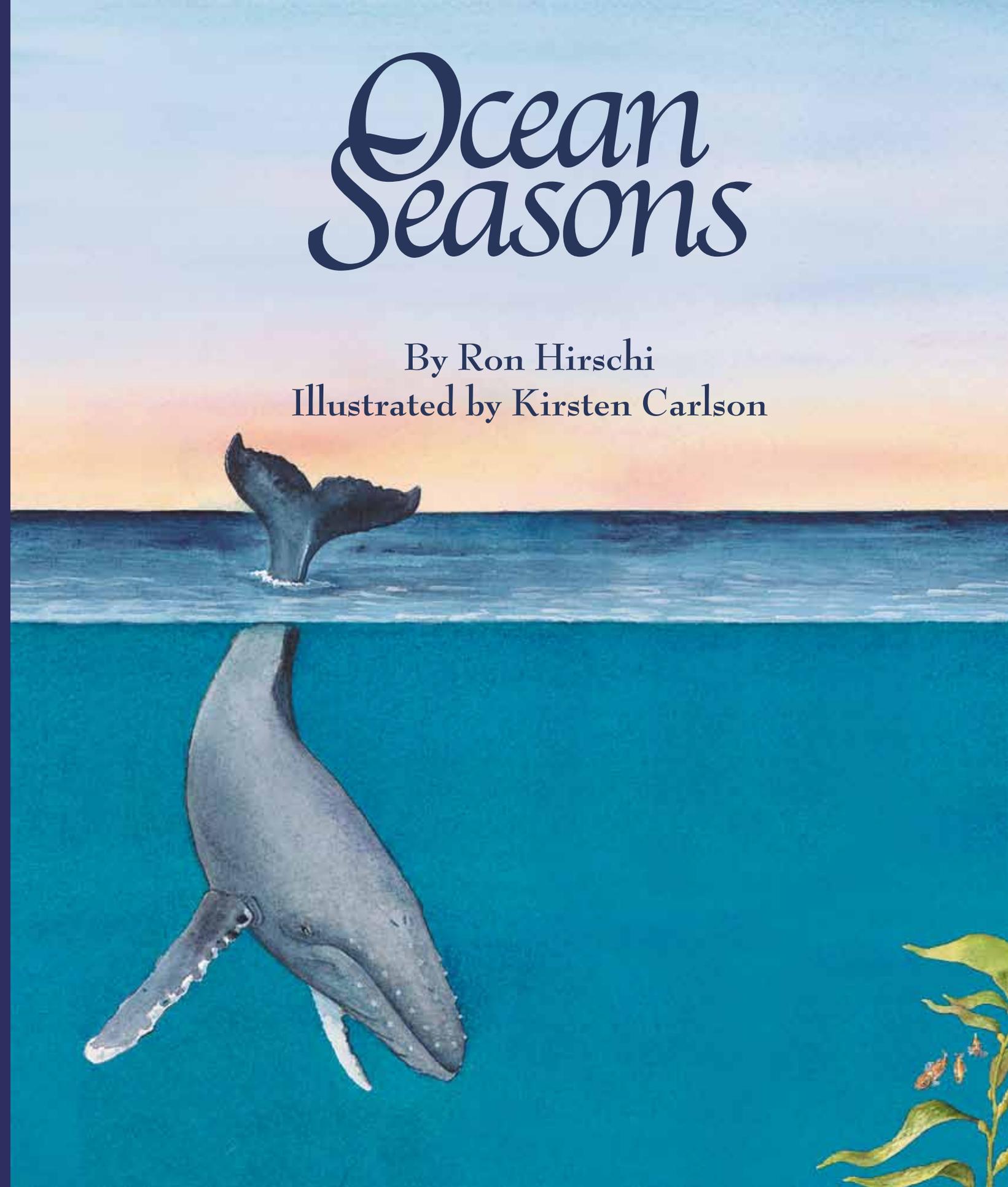
Ron Hirschi



Kirsten Carlson

Ocean Seasons

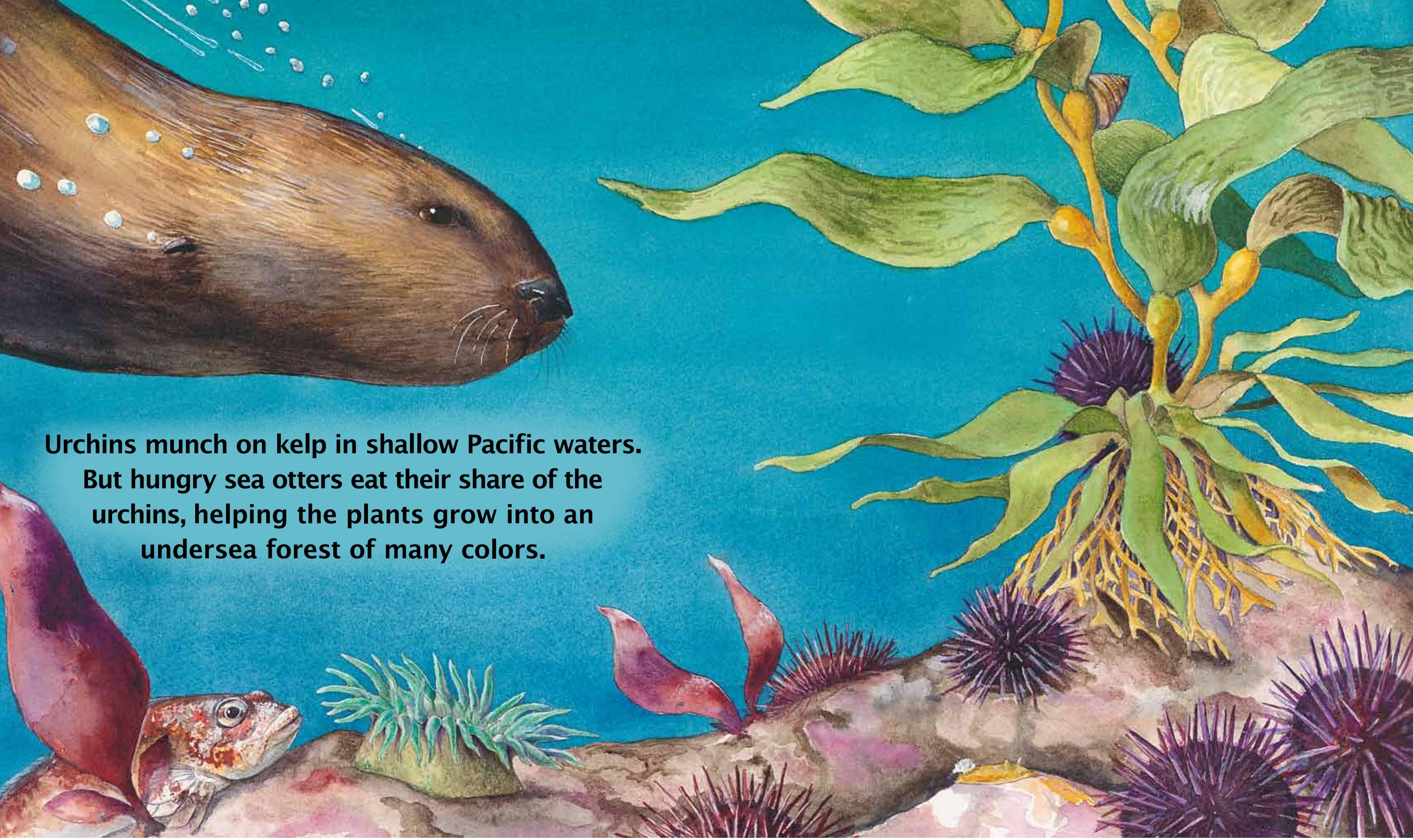
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Spring is a burst of color on land and in the sea as plants spread their soft, new growth.



For Jodi, a true miracle—RH
For those who would like to
fathom the depths of nature—KC

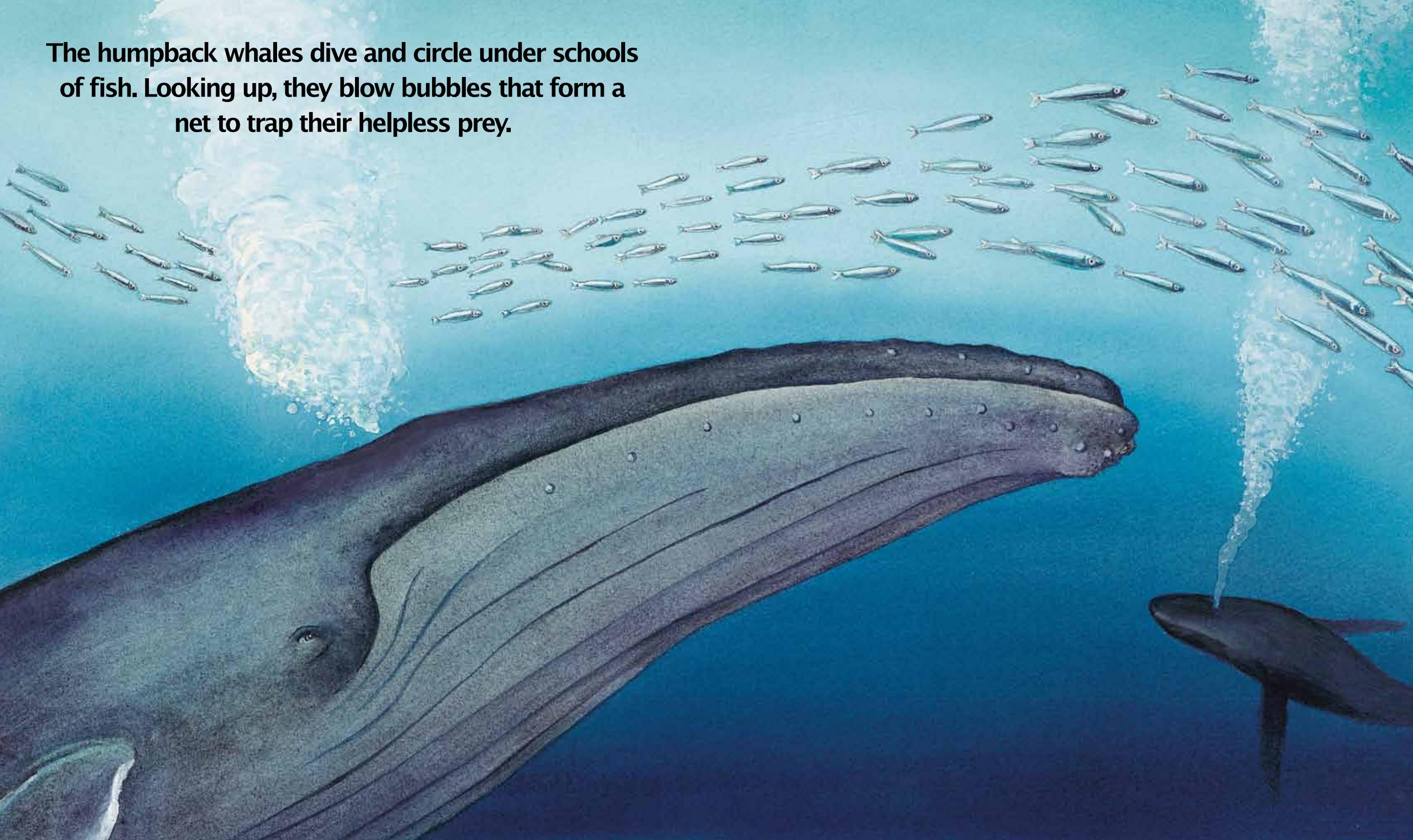


Urchins munch on kelp in shallow Pacific waters. But hungry sea otters eat their share of the urchins, helping the plants grow into an undersea forest of many colors.

Many fish, crabs, and shrimp hide and feast in the kelp forest. Diving birds and swimming seals dine on the young fish that live in the dense tangles of kelp.



The humpback whales dive and circle under schools of fish. Looking up, they blow bubbles that form a net to trap their helpless prey.

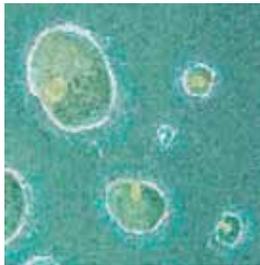


For Creative Minds

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Food Web Cards

Cut copies into food web cards. Using the information in the book and on the card, stack each “**predator**” card on top of its “**prey**” card (predators eat the prey). How many cards can you get in one pile? Are there some animals that are always at the top of your pile or on top of the food chain?



Phytoplankton
Prey: gets its energy from the sun (bottom card)
Predators: small fish, crabs, shrimp, and zooplankton



Phytoplankton
Prey: gets its energy from the sun (bottom card)
Predators: small fish, crabs, shrimp, and zooplankton



Phytoplankton
Prey: gets its energy from the sun (bottom card)
Predators: small fish, crabs, shrimp, and zooplankton



Kelp
Prey: gets its energy from the sun (bottom card)
Predators: urchins, snails, and crabs



Zooplankton
Prey: phytoplankton and other zooplankton
Predators: small fish, crabs, shrimp, and baleen whales



Urchins
Prey: kelp
Predators: sea otters, fish, crabs, and snails



Sea Otters
Prey: urchins, abalone, crabs, clams, octopuses, fish, and sea stars
Predators: orca whales, bald eagles, and sharks



Small Fish
Prey: phytoplankton, zooplankton, and other small fish
Predators: big fish, crabs, and orca and humpback whales



Small Fish
Prey: phytoplankton, zooplankton, and other small fish
Predators: bigger fish, crabs, and orca and humpback whales



Big Fish
Prey: small fish, zooplankton, crabs, shrimp, and urchins
Predators: sharks, dolphins, seals, sea lions, bears, orca whales, and humans



Crabs
Prey: kelp and other plants, small fish, worms, and decaying matter
Predators: humans, octopuses, big fish, snails, and other crabs



Seals (Harbor Seals)
Prey: squid, octopuses, clams, shrimp, and fish
Predators: orca whales, polar bears, humans, and sharks



Humpback Whales
Prey: plankton and small fish
Predators: orca whales and humans



Salmon
Prey: plankton, fish, squid, and shrimp
Predators: humans, seals, orca whales, eagles, seabirds, bears, and sea lions



Humans
Prey: urchins, crabs, shrimp, fish, whales, and seals
Predators: none



Orca Whales
Prey: other whales, seals, sea lions, fish, sharks, birds, and sea turtles
Predators: none

Seasons Come and Go, Around and Around

Spring

On land, plants bud and blossom in the **spring**; in the ocean, marine plants bloom too. Just like land animals, many fish and marine animals are born or hatch in the spring when plants and food are plentiful. These births signal a time of feasting so important that humpback whales travel thousands of miles to dine on the newly hatched fish and blooms of plankton.



Summer

During the **summer**, insects swarm on land and marine plants (phytoplankton) and invertebrates float on the sea's surface. Near the shore, dense tangles of kelp and other seaweeds create undersea forests. Some small fish lay their eggs on these sea plants. Herring and other small forage fish swim away from the shore and become important food for whales.



Autumn

Autumn winds blow leaves from trees on land. In the ocean, powerful winds whip the waves that tear leaves and entire plants from the sea floor. Tangles of these plants float like small islands, offering birds, and even seals, a resting place at sea. The seaweed tangles also wash onto beaches, creating another important food source for small marine life.



Winter

Winter brings colder weather to land and the ocean. In some areas, rain turns to snow and ice might line the ocean shore. In other areas, it gets cold but not enough to snow. Some animals migrate or move to warmer areas in the winter. *What are some other animals that migrate? What are some other ways that animals protect themselves from the colder weather?*



Ocean Food Web

Our food comes from many sources. Most of us simply buy it at the grocery store without paying attention to where food is grown or prepared. Yet, some of us still catch fish from the sea, pick berries in the meadows, or visit local farms for fresh fruits and vegetables.



Imagine how different life is for wild animals. They never go to a grocery store or restaurant and don't get to come inside for hot chocolate on a cold, winter day! They have to find or catch their own food when and where it is available.



Plants are the “bottom” of food webs because they make their own food by getting their energy from the sun. Seaweed, kelp, eel, and turtle grass are all types of ocean plants. The most common ocean plants are called **phytoplankton**.

Zooplankton are tiny floating animals that eat phytoplankton. Some stay the same their entire lives. Others are early life stages of much larger animals such as lobsters, crabs, and other sea life.



Together, phytoplankton and zooplankton are just called **plankton**. Most are so tiny you would need a microscope to see each one. But they appear in such large numbers, that they often paint miles and miles of the sea with a solid wash of colorful plankton blooms. Some zooplankton, such as shrimp-like krill, can be two inches long and weigh a gram (about as much as a paper clip). While some plankton such as krill can swim a little, most drift with the wind and tides. Not only do smaller animals eat plankton, but the largest animals on earth eat plankton—blue whales!



Baby animals live in shallow waters where **kelp forests**, **mangrove swamps**, and **salt marshes** make important **nursery habitats**. They can hide in the dense growth of plants, where there is lots of food to eat as plankton and chunks of plants swirl in with the tides.



When animals in the nurseries get bigger, many start swimming farther and farther in search of food, deeper waters, or distant breeding grounds.



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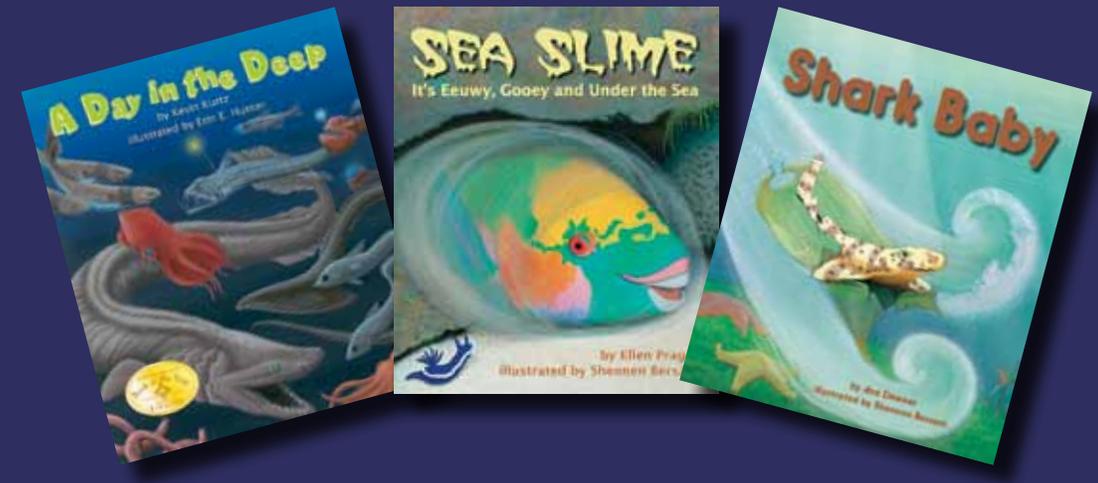
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