

# Immersion Presents *Monterey Bay*



## Cool Fact



Chances are you use seaweed every day. **Kelp** and other seaweeds can be found in many common products like shampoo, toothpaste, and even ice cream!



## Cool Words

### Kelp

A large brown seaweed that grows in cold coastal waters

### Holdfast

A branching structure that grows over rocks and holds kelp in place

### Stipe

A strong, flexible, stem-like structure of kelp

### Blade

A flat, leaf-like structure that grows out of a kelp's stipe

### Pneumatocyst (new MA toh sihst)

A gas-filled, balloon-shaped "float" that pulls kelp stipes and blades toward the surface

### Canopy

A thick collection of blades and stipes that forms the upper layer of a kelp forest

### Understory

The layer of a kelp forest made up of thick, short kelps that stand up to 6 ft (2 m) above the sea floor

### Turf

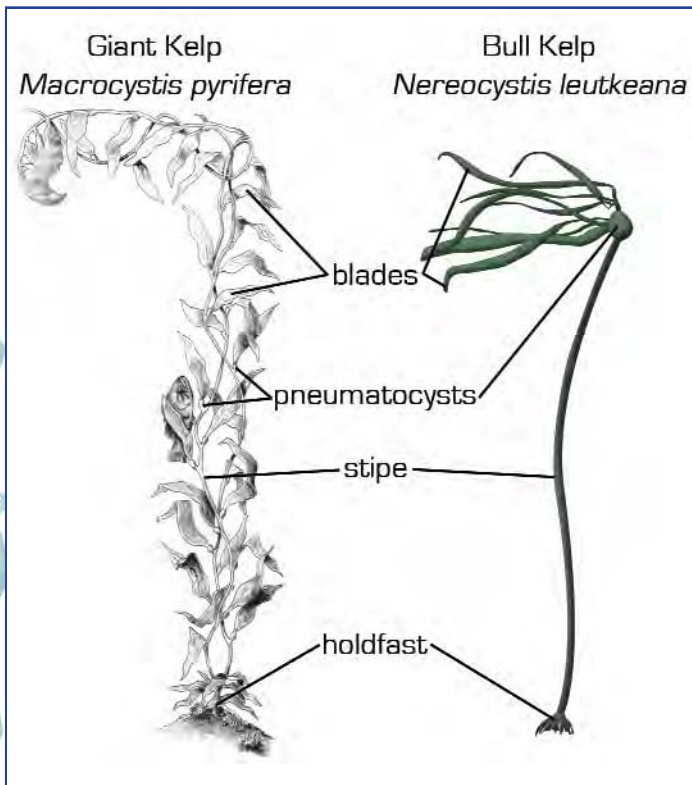
The bottom layer of a kelp forest made up of holdfasts and algae-covered rocks





There are many kinds of seaweed in the Monterey Bay National Marine Sanctuary. But a few kinds tower over all of the others. These seaweeds are members of the kelp family. Kelp is a large brown seaweed that grows in cold coastal waters. It is one of the fastest-growing organisms on Earth. One type of kelp can grow up to 18 in. (46 cm) a day and can reach heights of more than 100 ft (30 m)!

Although kelp looks like a plant, it is actually an alga (plural: algae). Algae do not have true roots, stems, or leaves. Instead of roots, kelp has a branching structure called a **holdfast** that grows over rocks on the sea floor. Unlike roots, holdfasts do not take in nutrients. The main purpose of the holdfast is to keep the kelp from floating away.

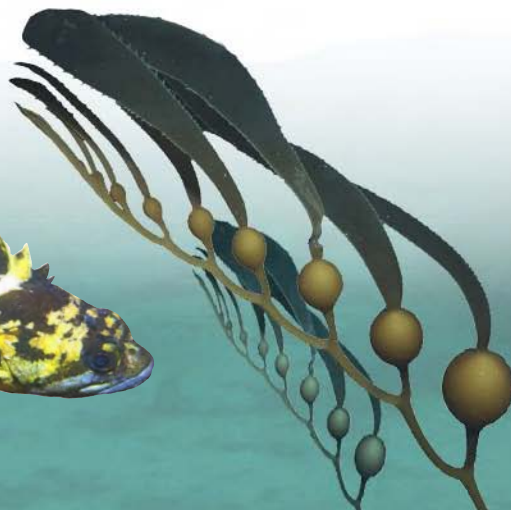


Giant kelp and bull kelp are the two main canopy-forming species of kelp found in the Monterey Bay National Marine Sanctuary.

© Monterey Bay Sanctuary Foundation [giant kelp drawing]

Rising up from a kelp's holdfast is a stem-like structure called a **stipe**. The stipe is strong and flexible. Flat, leaf-like **blades** grow out of the stipe. Blades use sunlight to make food for the kelp. They also absorb nutrients directly from the water. Kelp stipes and blades cannot stand up on their own. Gas-filled, ball-shaped "floats" called **pneumatocysts** (new MA toh sihsts) pull the stipes and blades toward the sunlit surface.

Some types of kelp form towering forests. When groups of kelp grow tall enough to reach the surface, they spread out across the water and form a thick mat. This upper layer of a kelp forest is known as the **canopy**. Its crowded collection of stipes and blades provides shelter for animals like crabs, snails, and young fish.





A scuba diver and a remotely operated vehicle (ROV) explore a kelp forest in the Monterey Bay National Marine Sanctuary.

© Immersion Presents

Beneath the canopy, the stipes of the kelp forest stand upright like underwater trees. Adult fish, seals, and other animals swim among the kelp in this midwater region. Deeper down is the **understory**, a layer of thick, short kelps that stand up to 6 ft (2 m) above the sea floor. The understory offers shelter to creatures that spend time near the rocky bottom. The lowest layer of the kelp forest, called the **turf**, is crowded with holdfasts and algae-covered rocks. Animals like sea urchins, crabs, and anemones (uh NEH muh neez) make the turf their home.

Forests of giant kelp thrive in the Monterey Bay National Marine Sanctuary. The water temperature is just right—colder than in tropical regions but not as cold as in arctic areas. Seasonal upwelling delivers lots of nutrients to the kelp in the summer. Winter storms thin the forests, ripping off pieces of kelp and tearing holdfasts loose from the sea floor. But when upwelling begins again, old kelp usually recovers quickly and new kelp adds to the forests.

Kelp forests play an important role in the sanctuary all year long. They provide food and shelter for many creatures.

They absorb energy from powerful waves that might otherwise damage the coast. They benefit people, too. You already know that kelp is used in several household products. It is also used as a fertilizer for crops on land. When kelp is collected responsibly, it re-grows quickly and can come back again and again.



A giant kelp holdfast secures the kelp to the rocky bottom and also provides shelter for many small creatures.

© Claire Fackler/NOAA

**Now that you know about kelp forests,  
follow the steps on the next page to  
learn more about some of the  
organisms that live there!**






## Activity

In this activity, you will play a game to learn more about the organisms that live in kelp forests.

## Materials

 24 kelp forest organism cards

 paper bag

 six-sided die



## Ready to Begin?

### Steps

#### *Part 1: Meet the Organisms*

1. Look at all of the kelp forest organism cards. Study the pictures on the cards and read the information about each organism.
2. Take turns quizzing a partner about the organisms. Have your partner read you a description of an organism and see if you can give the correct name without looking at the card. Then have your partner show you a picture of an organism (covering up the name and description) and see if you can name the organism.

#### *Part 2: Name That Kelp Organism*

1. You will be on one of two teams for this game. Help your team come up with an ocean-related team name.

2. There are three rounds in the game. In each round, a player from one team pulls a kelp forest organism card out of a bag. The player's goal is to get his or her team members to guess the organism on the card. Each round has different rules about what the player can do to help team members guess the name of the organism.

*Round 1:* The player can describe the organism in words and can also act out the organism as in charades.

*Round 2:* The player rolls a die. The number on the die determines how many words the player can use to describe the organism. For example, if the roll is a "three," the player can choose up to three words to describe the organism. The player can also act out the organism as in charades.

*Round 3:* The player cannot use any words to describe the organism and can only act out the organism as in charades.





**3.** Teams should take turns performing cards each round. Each team should perform three cards per round. Each team gets one “pass” per round that can be used to pull a different card from the bag. After each round, all of the cards should go back into the bag for the next round.

**4.** Each team gets three chances to guess the organism on the card. If any of the guesses are correct, the team earns a point. If all three guesses are wrong, the other team gets a chance to “steal” the point by guessing the correct answer on the first try. If both teams fail to guess the right answer, nobody gets the point.

**5.** Warm up with a practice round before beginning the three official rounds of the game. For the practice round, teams should use the Round 1 rules and should take turns performing cards until every card has been used once. No points can be earned during the practice round.

**6.** The team with the most points at the end of the three official rounds is the winning team!





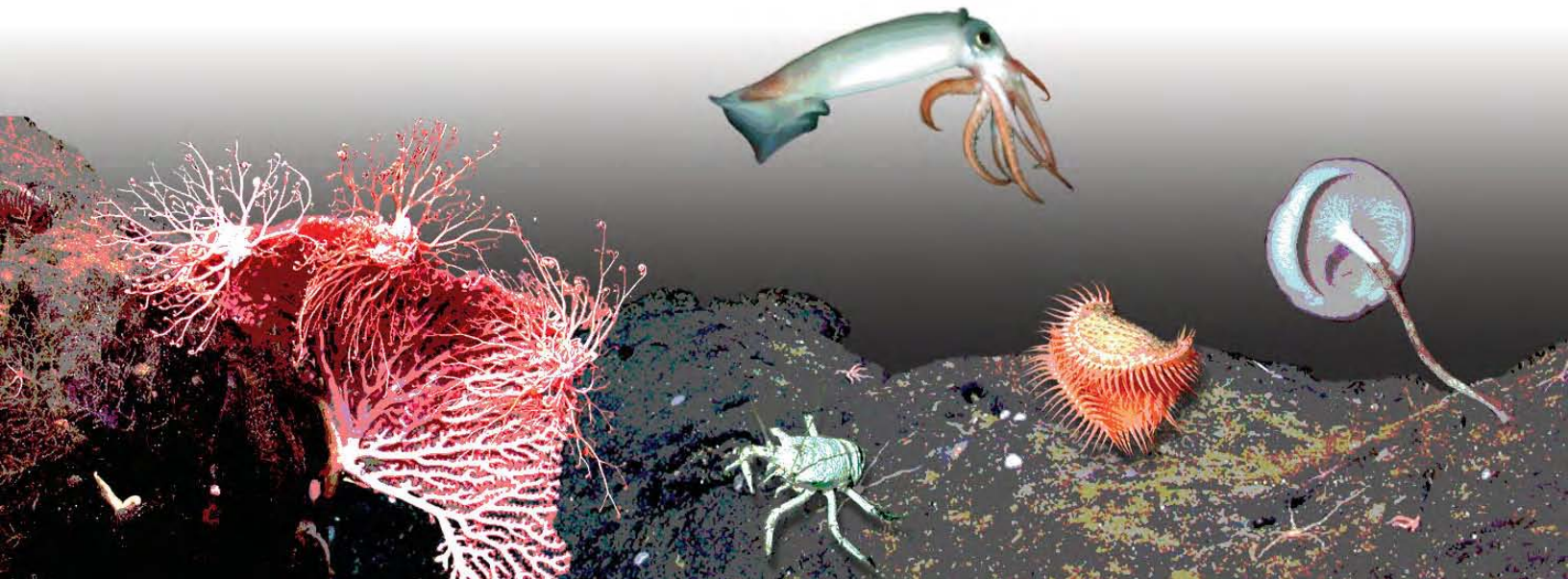
## Taking It Further Activity: Make a Kelp Forest Mural

Use the information on the kelp forest organism cards to create a mural of a kelp forest. Use vertical strips of butcher paper for the background of the forest. Add green or brown streamers and small balloons to make three-dimensional giant kelp. Then draw each kelp forest organism where it might be found in a real kelp forest—in the canopy, in the midwater, in the understory, or in the turf. Visit NOAA's online *Encyclopedia of the Sanctuaries* to find more kelp forest creatures to add to your mural. Be sure to hang the finished mural in a place where many people can enjoy it!



### Think About It

Aside from the Monterey Bay National Marine Sanctuary, where else do forests of giant kelp grow? Do the same creatures live in all giant kelp forests?



# Leader Notes

Immersion Presents *Monterey Bay*  
Activity 4: Forests of the Sea



## Summary



In this activity, participants play a game to learn more about the organisms that live in the kelp forests of the Monterey Bay National Marine Sanctuary.

**Difficulty:** Easy to Medium

**Suggested Group Size:** 10 to 20

**Time:** 60 minutes

## Goals

Participants will:

- define *kelp*
- identify the main parts of kelp
- explain why kelp forests are important
- describe several organisms that live in the kelp forests of the Monterey Bay National Marine Sanctuary

## Materials

### *For each pair:*

- 24 kelp forest organism cards  
(do not need to be cut out)

### *For the leader:*

- 24 kelp forest organism cards  
(need to be cut out)
- paper bag
- six-sided die

### *For the Taking It Further Activity:*

- kelp forest organism cards
- butcher paper
- green or brown party streamers
- small balloons
- tape or glue
- poster paints, markers, or colored pencils

## Cool Words

### **Kelp**

A large brown seaweed that grows in cold coastal waters

### **Holdfast**

A branching structure that grows over rocks and holds kelp in place

### **Stipe**

A strong, flexible, stem-like structure of kelp

### **Blade**

A flat, leaf-like structure that grows out of a kelp's stipe

### **Pneumatocyst (new MA toh sihst)**

A gas-filled, balloon-shaped "float" that pulls kelp stipes and blades toward the surface



## Canopy

A thick collection of blades and stipes that forms the upper layer of a kelp forest

## Understory

The layer of a kelp forest made up of thick, short kelps that stand up to 6 ft (2 m) above the sea floor

## Turf

The bottom layer of a kelp forest made up of holdfasts and algae-covered rocks

## Think About It

Aside from the Monterey Bay National Marine Sanctuary, where else do forests of giant kelp grow? Do the same creatures live in all giant kelp forests?

*Forests of giant kelp grow in cold, clear, nutrient-rich coastal waters that are up to about 100 ft (30 m) deep. The sea floor must be rocky for kelp forests to take hold and thrive. Giant kelp forests are found along the western coast of North America from Alaska to Baja California as well as along the western coast of South America. They are also found in some places along the coasts of South Africa and Southern Australia. The same creatures do not live in all giant kelp forests. Variations in conditions such as amount of sunlight, water temperature, and amount of nutrients can cause differences in populations even in relatively geographically close areas. For example, the animals found in the giant kelp forests of the Monterey Bay National Marine Sanctuary are not identical to the ones found in the giant kelp forests of the Channel Islands National Marine Sanctuary. The colorful sheephead and garibaldi prefer the warmer southern waters of the Channel*

*Islands. The only time that they head up north to the Monterey Bay area is during unusually warm weather, such as that caused by El Niño events.*

## Extra Background

*Kelp Harvesting:* Kelp is harvested in many parts of the world, including the Monterey Bay National Marine Sanctuary. The amount of kelp that can be harvested is limited and its collection is regulated. For example, harvesters are allowed to cut kelp in only the top 4 ft (1.2 m) of the water column. A stipe stops growing after it has been cut, but uncut stipes keep growing and new stipes can grow from a kelp's holdfast. Some kelp beds are leased to licensed kelp harvesters that get exclusive rights to harvest the kelp within the beds for the duration of the lease. Other beds are open and are available to anyone with a harvesting permit. Large-scale kelp harvesting operations use boats with mowing devices to cut off the top few feet of kelp. Individual harvesters use large clippers to collect the kelp by hand.

Harvested kelp is commonly used as fertilizer, food for commercial abalone farms, and a source of algin. Algin is a slippery substance that is extracted from kelp and used in many products. It binds together oily and watery ingredients in some brands of salad dressing. It creates a smoother consistency and thickens some brands of ice cream and toothpaste. Algin also acts as a stabilizer to give many kinds of frozen foods a smoother texture. Consider going on a grocery store scavenger hunt to look for products that contain algin or carrageenan (a chemical extracted from red algae that has some of the same properties as algin).





For a more in-depth analysis of kelp harvesting in and around the sanctuary, see the *Monterey Bay National Marine Sanctuary Kelp Management Report* and other resources listed in the Additional Information section.

## Set-Up

If possible, make copies of the kelp forest organism cards in color. Make enough copies so that each pair has a complete set of cards to use in Part 1. Be sure to cut out a full set of cards to place in a paper bag prior to the start of Part 2.

## Working With Groups

This first part of this activity works well in pairs. The second part works well in two teams, with five to ten participants per team.

## Activity Notes

Allow participants at least 10 minutes for Part 1. They will likely be unfamiliar with the species on the cards before the activity and will need time to learn about them in order to be successful during the game. If you do not have time for this part of the activity, or if you want to make the game easier, consider allowing participants to use the cards as a reference during Part 2.

During the practice round, teams should take turns going through all of the cards so that they have a chance to see each organism once before starting the three official rounds of the game. If you have a limited amount of time or want to make the game easier, consider using only the first 12 cards (Parts 1 and 2). You could use the second set of 12 cards (Parts 3 and 4) if you decide to play the game again.

If participants need help understanding the different rules of the three rounds, have each team do an example for each round using well-known animals instead of kelp forest organisms. For example, a player might do the following for “elephant”:

*Round 1:* Say, “I am a large, gray animal that has big ears and a long trunk.” Walk around hunched over and swing one arm from side to side to mimic a trunk. Stomp feet and make motions to indicate large ears.

*Round 2:* If “six” is rolled on the die, say, “large, gray, big ears, long trunk.” (If a number less than six is rolled, modify the phrase accordingly.) Walk around hunched over and swing one arm from side to side to mimic a trunk. Stomp feet and make motions to indicate large ears.

*Round 3:* Walk around hunched over and swing one arm from side to side to mimic a trunk. Stomp feet and make motions to indicate large ears.

For Round 2, participants cannot say more words than the number from the roll of the die. However, once they decide which words to say, they can repeat the words as many times as they want.

Remind participants that each answer that a team member calls out counts as a guess. Encourage participants to talk amongst themselves to come up with their best guesses rather than calling out answers randomly. If it is taking too long for participants to make their guesses, consider instituting a time limit of 60 seconds per card. After three guesses are made or time expires, the second team is allowed to make its one guess.



## Taking It Further Activity

Measure the floor-to-ceiling height of the area where you want to display the finished mural. Cut several pieces of butcher paper equal to this height. Tape the lengths of butcher paper together side-by-side to create a large canvas that will reach from the floor to the ceiling. Have participants make models of giant kelp using green or brown streamers for the stipe, blades, and holdfast, and small balloons for the pneumatocysts. Then have them use markers, colored pencils, or poster paints to add a variety of kelp forest organisms to the mural.

## Discussion Questions

▶ What is kelp? *[Kelp is a large brown seaweed that grows in cold coastal waters.]*

▶ What are the four main parts of giant kelp? What is the function of each part? *[The four main parts of giant kelp are the holdfast, the stipe, the blades, and the pneumatocysts. The holdfast grips rocks tightly and keeps the kelp from floating away. The stem-like, flexible stipe allows the kelp to grow tall enough to reach the surface. The blades use sunlight to make food for the kelp and also absorb nutrients from the water. The pneumatocysts buoy the kelp stipe and blades toward the sunlit surface. Stipes that are too short remain below the kelp forest canopy.]*

▶ What are kelp forests and why are they important? *[Kelp forests are made up of one or more species of canopy-forming kelps that grow in towering formations, covering a relatively large area and resembling forests on land. They are important because they provide food and shelter for many creatures. They absorb energy from powerful waves that might otherwise damage the coast. Kelp and extracts from kelp are used in household products such as toothpaste, shampoo, and ice cream. Kelp is also used as a fertilizer for crops on land.]*

▶ Describe five kelp forest organisms. What do they look like? Where do they live? What do they eat and/or what eats them? *[Answers will vary.]*

▶ If you could be any organism in the kelp forest, what would you be and why? *[Answers will vary.]*

## Additional Information

### Books

*A Living Bay: The Underwater World of Monterey Bay*, by Lovell Langstroth and Libby Langstroth.

*A Natural History of the Monterey Bay National Marine Sanctuary*, edited by Michael A. Rigsby.

*The Secrets of Kelp Forests: Life's Ebb and Flow in the Sea's Richest Habitat [Jean-Michel Cousteau Presents]*, by Howard Hall [Author], Jean-Michel Cousteau [Creator], and Vicki Leon [Editor].





## Videos

*Kelp Forests of Monterey Bay*, produced by Immersion Presents [online]

*Oceans for Life: Biodiversity*, produced by the National Geographic Society in collaboration with the NOAA National Marine Sanctuary Program [online]

*Oceans for Life: Marine Protected Areas of California*, produced by the National Geographic Society in collaboration with the NOAA National Marine Sanctuary Program [online]

## Web Sites

*Immersion Presents* Web site

*Monterey Bay Aquarium* Web site

Monterey Bay National Marine Sanctuary's *Monterey Bay National Marine Sanctuary Kelp Management Report* Web page

*Monterey Bay National Marine Sanctuary* Web site

National Geographic's *Sustainable Seas Expedition: Monterey Bay: Kelp Forest Virtual Dive* Web page

NOAA National Marine Sanctuaries' *Ecosystems: Kelp Forests* Web page

NOAA National Marine Sanctuaries' *Encyclopedia of the Sanctuaries* Web site

*Sanctuary Integrated Monitoring Network (SIMoN)* Web site

**Note:** Links to all Web resources can be found at [www.immersionpresents.org/monterey/links.html](http://www.immersionpresents.org/monterey/links.html).

**Note:** Background information for the Kelp Forest Organism Cards was adapted from the following sources:

- Monterey Bay Aquarium's *Critter Cards* Web site: [www.mbayaq.org/lc/activities/critter\\_cards.asp](http://www.mbayaq.org/lc/activities/critter_cards.asp)
- Monterey Bay Aquarium's *Online Field Guide* Web site: [www.mbayaq.org/efc/living\\_species](http://www.mbayaq.org/efc/living_species)
- NOAA National Marine Sanctuaries' *Encyclopedia of the Sanctuaries* Web site: [marinelife.noaa.gov](http://marinelife.noaa.gov)
- Sanctuary Integrated Monitoring Network (SIMoN)'s *Photo Database* Web site: [www.mbnms-simon.org/other/photos](http://www.mbnms-simon.org/other/photos)





## Kelp Forest Organism Cards — Part 1 of 4

### Red Abalone (A buh loh nee)

**Scientific Name:**  
*Haliotis rufescens*

**Description:** Can be up to 11 in. (28 cm) long; single shell has rough texture; large, muscular foot surrounded by thick, black tentacles; lives in cracks and crevices; loves to eat kelp; largest shell size of all abalone species

**Where it lives in the kelp forest:** Turf

**What it eats:** Algae

**Cool fact:** Red abalone are a favorite food of sea otters.



### Jeweled Top Snail

**Scientific name:**  
*Calliostoma annulatum*

**Description:** Can be up to 1 in. (2.5 cm) tall; very colorful, cone-shaped golden shell with rings of pink and blue

**Where it lives in the kelp forest:** Midwater and canopy on kelp stipes and blades

**What it eats:** Algae

**Cool fact:** A jeweled top snail has a rough tongue that it uses to scrape a thin layer off of kelp blades.



### Bat Star

**Scientific name:**  
*Patiria miniata*

**Description:** Can be up to 8 in. (20 cm) across; body can be red, orange, yellow, brown, green, or purple; usually has five arms but can have up to nine; has thousands of small suction cups on the underside of each arm

**Where it lives in the kelp forest:** Turf

**What it eats:** Algae, small animals such as crabs and clams, dead animals

**Cool fact:** A bat star extends its stomach out of its mouth to locate, capture, and digest its food.



### Red Volcano Sponge

**Scientific name:**  
*Acanthaster erithacus*

**Description:** Can be up to 1.5 in. (3.8 cm) tall and 12 in. (30 cm) in diameter; bright red color; many volcano-shaped mounds on outer surface

**Where it lives in the kelp forest:** Turf

**What it eats:** Organic matter filtered from water

**Cool fact:** The red volcano sponge sucks water inside its body through millions of tiny pores, filters the water, then shoots the filtered water out of its “volcanoes” away from its body so it doesn’t re-filter the same water.



### Northern Kelp Crab

**Scientific name:**  
*Pugettia producta*

**Description:** Can be up to 3.6 in. (9.1 cm) across; smooth shell can be olive green to reddish brown; lives in and feeds on kelp

**Where it lives in the kelp forest:** Often in the canopy, but also in the turf

**What it eats:** Brown algae, red algae, sometimes small invertebrates (usually only in the winter when there are fewer algae)

**Cool fact:** The color of a northern kelp crab can vary based on the diet of algae that it eats.



### Blue Rockfish

**Scientific name:**  
*Sebastes mystinus*

**Description:** Can be up to 21 in. (53 cm) long; blue-black to bright blue body; has two to four dark bands that curve around the front of the head; usually found in schools

**Where it lives in the kelp forest:** Midwater

**What it eats:** Shrimp, jellyfish, other zooplankton

**Cool fact:** A blue rockfish has poisonous spines on some of its dorsal fins.



## Kelp Forest Organism Cards — Part 2 of 4

### California Sea Otter

**Scientific Name:**  
*Enhydra lutris nereis*

**Description:** Female can weigh up to 50 lb (23 kg); male can weigh up to 70 lb (32 kg); related to weasels, skunks, and river otters; spends many hours a day grooming its fur

**Where it lives in the kelp forest:** Canopy; hunts in understory and turf

**What it eats:** Mussels, clams, snails, crabs, octopuses, sea urchins, sea stars

**Cool fact:** A sea otter has the world's densest fur—up to one million hairs per square inch.



### Harbor Seal

**Scientific name:**  
*Phoca vitulina*

**Description:** Can be up to 5 ft (1.6 m) long; curious, but often shy around divers; does not have outer ear flaps; often rests on rocks near the edge of the water

**Where it lives in the kelp forest:** Midwater

**What it eats:** Fishes, crabs, squids, octopuses

**Cool fact:** A harbor seal uses its back flippers to swim quickly through the water, but it is slow and awkward on land.



### Leopard Shark

**Scientific name:**  
*Triakis semifasciata*

**Description:** Can be up to 6.5 ft (2 m) long; dark splotches, stripes, and spots over a gray-colored body; can be found alone or in large schools

**Where it lives in the kelp forest:** Turf and understory (but uncommon in MBNMS kelp forests)

**What it eats:** Fishes, fish eggs, crabs, clams, shrimps, other invertebrates

**Cool fact:** Although many shark species lay egg cases, leopard sharks give birth to live young.



### Bat Ray

**Scientific name:**  
*Myliobatis californica*

**Description:** Can be up to 6 ft (1.8 m) across; has a large, round, flat head, two bat-like pectoral fins, and a long, straight tail with a venomous barb where the tail joins to the body; moves pectoral fins up and down to swim; gentle and shy

**Where it lives in the kelp forest:** Turf (but uncommon in MBNMS kelp forests)

**What it eats:** Clams, shrimp, worms, other invertebrates

**Cool fact:** In the summer, female bat rays swim into bays and wetland areas to give birth to live young.



### White-Plumed Anemone (uh NEH muh nee)

**Scientific name:**  
*Metridium farcimen*

**Description:** Can be up to 20 in. (51 cm) tall and 4 in. (10 cm) in diameter; white body made up of a gut and mouth surrounded by a large set of finely-branching tentacles

**Where it lives in the kelp forest:** Turf

**What it eats:** Phytoplankton, zooplankton

**Cool fact:** Like other anemones, white-plumed anemones have tentacles with stinging cells that are used for self-defense and capturing prey.



### Giant Kelp

**Scientific name:**  
*Macrocystis pyrifera*

**Description:** Large, brown seaweed made up of a holdfast, stipe, blades, and pneumatocysts; can grow up to 18 in. (46 cm) a day, can be up to 100 ft (30 m) tall

**Where it lives in the kelp forest:** Giant kelp forms kelp forests!

**What it eats:** Uses the energy in sunlight to convert water and carbon dioxide into sugars and oxygen.

**Cool fact:** Pieces of dead and decaying giant kelp sink to deep areas of the ocean and provide food for deep-sea creatures.





## Kelp Forest Organism Cards — Part 3 of 4

### Leafy Hornmouth

**Scientific Name:**  
*Ceratostoma foliatum*

**Description:** Can be up to 3.5 in. (8.5 cm) long and 2 in. (5 cm) wide; white, gray, or yellow-brown shell; three equally spaced wing-like extensions run the length of the shell

**Where it lives in the kelp forest:** Turf

**What it eats:** Barnacles, small clams

**Cool fact:** A leafy hornmouth uses its crowbar-like "tooth" to pry open or chip the shells of its prey.



### Warty Sea Cucumber

**Scientific name:**  
*Parastichopus parvimensis*

**Description:** Can be up to 10 in. (25 cm) long; shaped like a cylinder; very soft

**Where it lives in the kelp forest:** Turf

**What it eats:** Detritus (small pieces of dead and decaying organic matter)

**Cool fact:** A warty sea cucumber uses hundreds of tiny suction-cup feet to move.



### Purple Sea Urchin

**Scientific name:**  
*Strongylocentrotus purpuratus*

**Description:** Can be 2 to 4 in. (5 to 10 cm) across; round shell (also called the "test") covered with bright purple spines; many tube feet among spines cling to rocks; usually found in cracks and crevices; a favorite food of sea otters

**Where it lives in the kelp forest:** Turf

**What it eats:** Brown algae, red algae

**Cool fact:** Five tooth-like plates, called "Aristotle's lantern," surround an urchin's mouth on the bottom of its shell and shred kelp into bite-sized pieces.



### Moss Crab

**Scientific name:**  
*Loxorhynchus crispatus*

**Description:** Can be up to 5 in. (12.7 cm) long; small body with long, slender legs; picks up many algae, sponges, and other small creatures to place on its shell for camouflage

**Where it lives in the kelp forest:** Turf

**What it eats:** Algae, sponges, sea urchins, small crustaceans

**Cool fact:** When a moss crab molts and grows a new shell, it often transfers its living decorations from the old shell to the new one.



### California Sea Lion

**Scientific name:**  
*Zalophus californianus*

**Description:** Male can weigh up to 750 lb (340 kg); female usually not heavier than 220 lb (100 kg); has small, furry outer ear flaps; can swim fast and can also move well on land; often gathers in large groups on land and makes loud barking sounds

**Where it lives in the kelp forest:** Midwater

**What it eats:** Squid, fishes, octopuses

**Cool fact:** A California sea lion can dive up to 800 ft (244 m) deep.



### Brandt's Cormorant

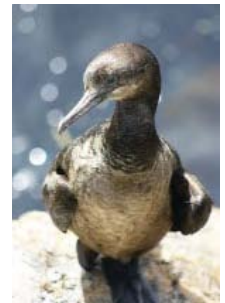
**Scientific name:**  
*Phalacrocorax penicillatus*

**Description:** Can be up to 31 in. (79 cm) tall; brownish-black body has a green shine; dives to collect food, using feet and wings to swim under water; pokes head into cracks and crevices to feed on crabs

**Where it lives in the kelp forest:** Above canopy; dives into midwater

**What it eats:** Fish, crustaceans

**Cool fact:** A Brandt's cormorant collects strands of algae to use in building its nest.



## Kelp Forest Organism Cards — Part 4 of 4

### Kelp Rockfish

**Scientific Name:**  
*Sebastes atrovirens*

**Description:** Can be up to 17 in. (43 cm) long; grayish-brown body hangs motionless, often vertically, in kelp forests

**Where it lives in the kelp forest:** Canopy, midwater

**What it eats:** Small fishes, shrimps, other small crustaceans

**Cool fact:** A kelp rockfish often attempts to mimic the position and movement of kelp blades.



### Cabezon

**Scientific name:**  
*Scorpaenichthys marmoratus*

**Description:** Can be up to 2.5 ft (76 cm) long; known especially for large head and mouth; captures prey by lunging out as they swim or crawl by

**Where it lives in the kelp forest:** Turf

**What it eats:** Crabs, snails, squids, some fishes

**Cool fact:** “Cabezon” means “big head” in Spanish.



### Wolf Eel

**Scientific name:**  
*Anarrichthys ocellatus*

**Description:** Can be up to 6 ft (1.8 m) long; body long and gray with dark spots; large, pointy teeth; lumpy head

**Where it lives in the kelp forest:** Caves or rock shelters in turf (but uncommon in MBNMS kelp forests)

**What it eats:** Crabs, sand dollars, snails, other invertebrates

**Cool fact:** A male and female pair of wolf eels will often live together in the same cave for many years.



### Orange Cup Coral

**Scientific name:**  
*Balanophyllia elegans*

**Description:** Can be up to 1 in. (2.5 cm) tall; each orange-colored polyp (individual coral animal) has a gut and mouth surrounded by tentacles; builds a cup for itself out of calcium carbonate (limestone)

**Where it lives in the kelp forest:** Turf

**What it eats:** Small animals, organic particles

**Cool fact:** Although they are true corals, orange cup corals do not build reefs. Instead, each coral polyp lives by itself in its own cup.



### Articulated Coralline Algae (ar TIK yoo lay tid • KOR uh lin • AL jee)

**Scientific name:**  
*Calliarthron* spp.

**Description:** Can grow up to 10 in. (25 cm) tall; branching, light-purple-colored alga makes its own limestone skeleton; branches have flexible joints

**Where it lives in the kelp forest:** Turf

**What it eats:** Uses the energy in sunlight to convert water and carbon dioxide into sugars and oxygen.

**Cool fact:** Coralline algae grow slowly. An articulated coralline alga that is 1/8-in. (3 mm) tall could be more than nine years old.



### California Understory Kelp

**Scientific name:**  
*Pterygophora californica*

**Description:** Can grow up to 6.5 ft (2 m) tall; rough blades extend out of the top of the woody stipe; blades can wear away in winter, but new ones are produced each spring; major understory-forming kelp

**Where it lives in the kelp forest:** Understory

**What it eats:** Uses the energy in sunlight to convert water and carbon dioxide into sugars and oxygen.

**Cool fact:** The woody stipe of California understory kelp has growth rings like a tree.

