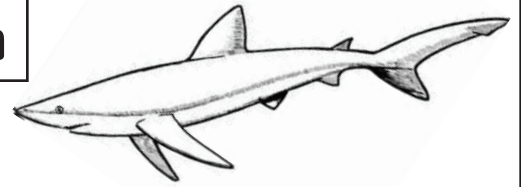


## Galleria: Life in the Open Ocean



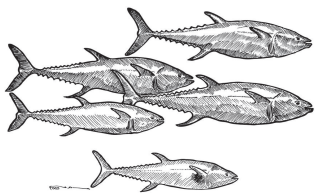
### Sharks of Southern California

In the open ocean there are very few places for sharks to hide.

Look up at the shark models hanging in the Galleria.

**How might the pattern on the sharks help them hide in the open ocean?**

View the "Sharks Circling Overhead" poster near the glass entrance doors to learn about these local species of sharks.



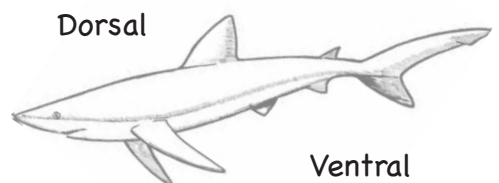
### Schooling Sardines

Small fish often swim in large groups called schools.

**How might swimming in schools benefit fishes living in the open ocean?**

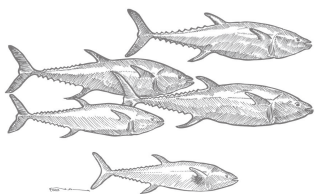
## Life in the Open Ocean ANSWERS

### Sharks of Southern California



Sharks, and many other open-ocean fishes, have a special coloration pattern (camouflage) called countershading. Countershading consists of a darker color on the top (dorsal) side of the fish and a lighter color on the bottom (ventral) side. This helps sharks blend into the dark ocean floor when viewed from above, and the bright sky when viewed from below.

### Schooling Sardines



By staying together in a school, fishes gain safety from predators, have a higher chance of finding food, and can find a mate easier.



## Hall of Fishes: Pacific Northwest

### Invertebrates

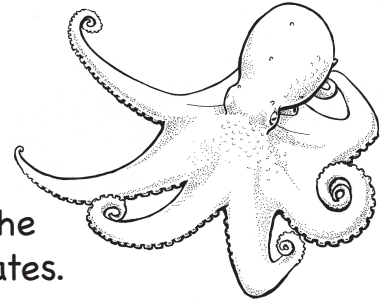
There are many animals living in the cold waters of the Pacific Northwest, including a variety of invertebrates.

**What is the definition of an invertebrate?**

Some examples of invertebrates are sea anemones and sea snails.

**Can you find which invertebrates live in the Pacific Northwest?**  
(Tanks #1-5)

**Did you know?** Octopuses are so flexible they can squeeze their whole body through a hole as small as the size of their eye!



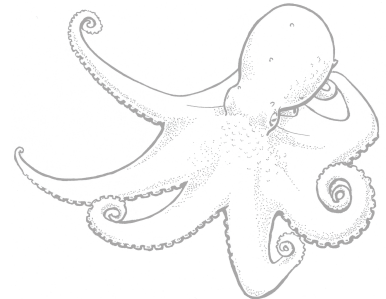
## Pacific Northwest ANSWERS

An invertebrate is a soft-bodied animal that lacks a rigid, internal backbone.

Some examples of invertebrates in our Pacific Northwest tanks include:

Sea anemones  
Chitons  
Duster worms  
Sea stars  
Sea urchins  
Abalones  
Octopus

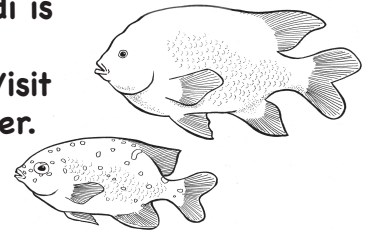
**How many different kinds of invertebrates did you find?**



## Hall of Fishes: Southern California

### Kelp Forest

Can you tell which garibaldi is the adult and which is the juvenile by its coloration? Visit Tank #15 to find the answer.



Did you know there are forests growing in the sea?

Kelp forests that is! Kelp is a marine algae (seaweed) that can grow up to 150 feet tall. Visit Tank #15 and the Kelp Forest tank to see some of the local animals living in our kelp forests.

Just like a forest on land, animals live at different zones in a kelp forest.

**What animals do you see living on the ocean floor?**

**What animals do you see living in the under story?**

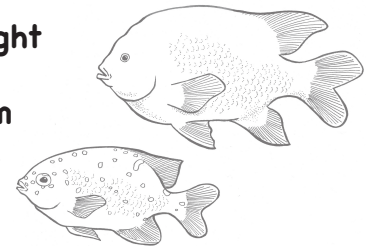
**What animals do you see living at the canopy (the very top)?**

**Did you know?** Garibaldi are California's state marine fish.

## Southern California ANSWERS

### Kelp Forest

Juvenile garibaldi have bright blue spots on their scales. These help distinguish them from the territorial adults.



The kelp forest is divided into three zones: the ocean floor, the middle zone, and the canopy. Animals live in the different zones of the kelp forest depending on their needs.

**Ocean floor:** animals that attach to or rest on the bottom

Example: Sea snails, sea anemones, shovelnose guitarfishes, swell sharks, hornsharks

**Under story:** animals that swim through or attach to the kelp

Example: Garibaldi, sheephead, leopard sharks, barracudas, moray eels

**Canopy:** animals that feed off top-dwelling prey, or those that use lungs to breathe; Example: Giant sea bass, topsmelts, variety of other fishes, plus air-breathers like dolphins, seals, sea lions, and birds.



## Hall of Fishes: Nursery

Baby horn shark and its spiral egg case.



Look at our newest arrivals in our Nursery Exhibit. **Read the exhibit signs to learn about how our aquarists are carefully taking care of them as they grow.**

One major benefit in raising our own babies here at the aquarium is that we do not have to take marine animals out of the ocean or harm their natural habitats.

Read the back of this page to learn more about the local species of sharks we raise here at the Birch Aquarium at Scripps.

**Did you know?** Some sharks are born from egg cases, like the horn shark shown in the image above.

## Nursery



**Horn Sharks** are benthic, or bottom-dwelling, sharks that feed on fish and invertebrates near the ocean floor. They have spines on their dorsal fins that aid in protection. Their maximum adult size is four feet. The unique spiral shape of their egg cases allows the mother shark to secure the egg between rocks on the ocean floor.



**Swell Sharks** are also benthic sharks that feed on fish and invertebrates. As their name suggests, this shark can swallow large amounts of water and swell up its body to twice its normal size. Swell sharks grow to be about three and a half feet in length. Their egg cases are known as mermaids purses.





# Self-Guided Explorations

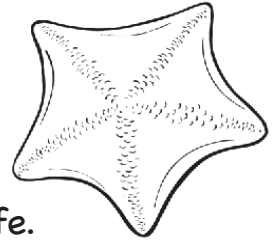
Upper Elementary



[www.aquarium.ucsd.edu](http://www.aquarium.ucsd.edu)

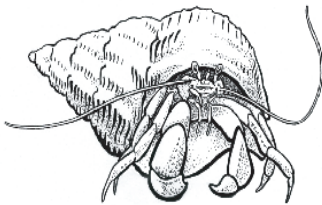
## Tidepool Plaza: Tide Pools

When the tide is low and the rocks are exposed, it's a great time to explore the tide pools! Tide pools are rocky habitats along the shore that become great homes for small marine life.



Roll up your sleeves and gently touch these intertidal animals with one or two "science" fingers.

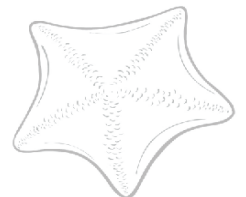
**What challenges might tide-pool animals experience living along the rocky shore?**



**Do you see any special traits these animals have to help them survive?**

**Did you know?** The seawater in our aquarium tide pools comes from the Pacific Ocean seen beyond our balcony.

## Tide Pools ANSWERS



Tide pools are areas along the rocky coastline that are exposed during low tide. At low tide, seawater becomes trapped between the rocks creating small pools for animals to survive in until the high tide returns.

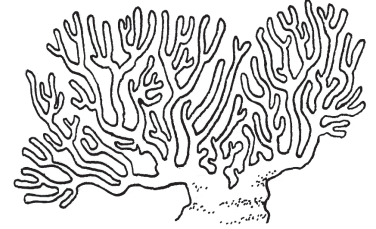
Living in a tide pool can be quite difficult. Predators, such as birds, can easily catch small animals exposed at low tide. Waves constantly crash on the rocks, pushing animals all around. At low tide, animals can dry out if they do not find shelter from the hot sun, such as a shady spot or a protective shell.

Many tide-pool animals have special traits (adaptations) that help them to survive and live safely in the tide pools. Sea snails have shells to protect them, sea stars have sticky tube feet to help them hold on and sea urchins have spines to protect them from predators. **What other adaptations can you find?**



## Hall of Fishes: Coral Reefs

Continue your journey to the warm Tropical Seas and view the bright colors of corals all around.



Visit Tank #26: Western Pacific Reef. **How do the following characteristics help reef fish hide in their environment?**

**Color      Pattern      Shape**

Surprisingly, over one quarter of the world's coral reefs have been severely damaged. Overfishing, warming oceans, and pollution are all threats to these sensitive reef-building creatures.



**Can you think of ways to help protect our oceans and conserve coral reefs around the world?**

**Did you know?** California is home to many species of cold-water corals that inhabit our deep sea.

## Coral Reefs ANSWERS

**Color:** Fish have bright colors to blend in to the colorful coral reefs. Color is also important to attract mates or warn predators the fishes are dangerous.

**Patterns:** Patterns help the reef fish camouflage into the multitude of colors on the corals. Disruptive patterns, such as stripes or spots, confuse predators to the fishes actual size and location.

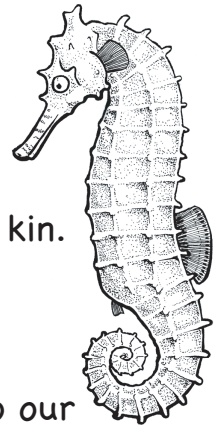
**Shape:** Reef fish have body shapes that are built for maneuverability instead of speed. Many fish have thin bodies to fit between the tight spaces of corals and large fins for turning.

**Ocean and Reef Protection:** Disposing of trash properly, recycling, reducing the amount of water use, and teaching others about the importance of our oceans and coral reefs are just a few ideas of how to help protect our oceans.





## There's Something About Seahorses



Enter the world of seahorses and you are bound to be amazed!

This exhibit not only features seahorses, but some of their close kin.

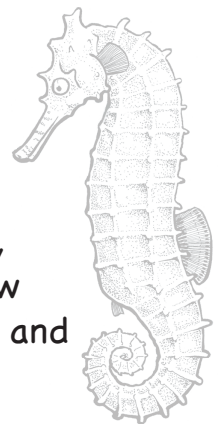
**What relatives to the seahorse can you find swimming in our seas?**

Continue on to our Seahorse Nursery to find the latest additions to our seahorse family. Rumor has it we feed our baby seahorses sea monkeys. Read the "Feeding and Housing Babies" display board and find out what sea monkeys really are.

**Are seahorses really fish?** Continue through the seahorse exhibit. Visit the "Something's Fishy Here" interactive display to find out what it takes to be a fish.

**Can you list the four characteristics that make a fish a fish?**

## There's Something About Seahorses ANSWERS



Some relatives to seahorses are seadragons, seamoths, cornetfishes, trumpetfishes, pipefishes, shrimpfishes, and snipefishes. You can view some of these species in our tanks or visit the "Compare Seahorses and Their Kin" interactive exhibit to learn more.

Sea monkeys are not monkeys at all but instead a common name used for brine shrimp. Brine shrimp are tiny crustaceans that serve an important role in marine environments as food for birds, fishes, and even whales.

Seahorses are fish! Though they may look quite unique, they do possess all the characteristics of a fish including fins, gills, a backbone, and a two-chambered heart.

