

Resources

Just for Teachers

Did you know that SeaWorld has a website just for educators? Visit SeaWorld.com/Teachers to find free activities and other classroom resources.

ANIMALS website

Are your students looking for more information about animals and habitats? Visit SeaWorld.org to explore up-to-date resources about hundreds of animals.

Group Camp

This multnight resident camp for grades 4-12 includes lodging, meals, activities, and supplies. For details call (619) 222-4SEA (4732) or explore online at SeaWorldSanDiego.com/Education.

Sleepovers

Spend the night at SeaWorld. This overnight outing for grades 2-8 provides fun and adventure while exploring nature up-close. Sleep next to whales, turtles, sharks, and more. For details call (619) 222-4SEA (4732) or explore online at SeaWorldSanDiego.com/Education.

Thank you

for participating in the SeaWorld field trip program today!

SeaWorld Field

Trip Guide

Welcome to SeaWorld!

Please adhere to the following guidelines:

- All animal exhibits and one show are included in your program. Check Seaworld.com for show time and location.
- The field trip program ends at 1:30 p.m.
- Rides and Sesame Street's® Bay of Play™ are not included in today's program (require pre-purchase of all-day program wristbands). This program is designed to introduce your students to marine life. Ensure a successful learning experience by visiting as many animal habitats as you can. Ask students' questions from this guide and encourage them to discover the answers by using observation skills, reading graphics, and interacting with the exhibit Educators. Answers are provided in parentheses.

The learning doesn't stop at SeaWorld. Back at school use the "Dive Deeper" challenges to encourage students to research answers own their own and share their results with the class.

SeaWorld's field trip program supports National Science Education Standards.

Penguin Encounter

Inside Penguin Encounter

- Penguins are birds—they cannot fly in the air, but they “fly” through the water! Watch penguins swim. What body part do they use for swimming? (*flippers*)
- Brrrrr! The penguin habitat is a cold -2°C (28°F). How do penguins stay warm? (*Waterproof feathers overlap to cover a penguin’s skin.*)
- Emperor penguins, the largest of all 18 penguin species, are up to 1.1 m (3.7 ft.) tall and weigh up to 41 kg (90 lb.). Can you find an emperor penguin?
- Penguin keepers simulate the southern hemisphere’s seasonal light changes in the Penguin Encounter. When it is summer in San Diego, the lights are dimmed because it is winter in Antarctica and dark nearly 24-hours a day. What season is it inside the Penguin Encounter now?

Outside Penguin Encounter

- Magellanic penguins, named after explorer Ferdinand Magellan, are adapted to a warm climate. Name four continents where penguins live. (*Africa, Australia, South America, and Antarctica.*)

Dive Deeper

Penguins are affected by climate change. When we use fossil fuels, such as gas for driving cars, carbon dioxide (CO_2) is released into Earth’s atmosphere. Excess CO_2 traps heat in our atmosphere, like a blanket around Earth, leading to warmer air and water temperatures. How can this excess heat affect penguins that need sea ice? Penguins that live in warmer climates?

Explorer’s Reef

- Freshwater cleaner fish keep their habitats clean, healthy, and free from overgrowth. Young cleaner fish pick parasites and dead tissue off other fishes. They are sometimes called “nibble fish.” Can you guess why? (*They will nibble bits of dead skin off hands and feet.*)
- Three types of bamboo sharks live at Explorer’s Reef: white-spotted, brown banded, and epaulette. Their slender bodies allow them to easily swim through coral crevices and branches. Can you find all three species?
- Horseshoe crabs are not true crabs, but more closely related to spiders and scorpions. Horseshoe crabs are called “living fossils” because they have been swimming in oceans nearly 400 million years!

Dive Deeper

Explorer’s Reef is designed to represent a living coral reef. Corals and other shell-building animals are at risk due to ocean acidification. Ask students to research this threat and include: why coral reefs are important for animals, humans

Orca Underwater Viewing

Orcas are the largest dolphin species. How do they resemble bottlenose dolphins? How are they different? (*Bottlenose dolphins and orcas share similar body shape; flippers, flukes, fins, blowhole, etc. They differ in color and size.*)

- Killer whales feature disruptive coloration: their dark body is broken up by white patches, making them appear smaller in dark and murky ocean waters.

Why do killer whales need camouflage? (*To hide from potential prey while hunting.*)

- Can you hear the orcas making any noises? Where on your body does your voice come from? (*Vocal cords in your throat.*) Orcas and other whales do not have vocal cords. They produce all the sounds that they make under their blowhole area.

At SeaWorld...

Just like people, orcas have doctors too. SeaWorld has veterinarians to keep killer whales and other animals healthy.

A whale check-up is similar to the way a human doctor check patients. A vet weighs the whale; examines its eyes, ears, and nose (blowhole); and takes a small blood or urine sample to examine in the lab.

Dive Deeper

Different populations of killer whales depend on different prey species for survival. One orca population in the Pacific Northwest preys mostly on salmon. This orca population is also endangered. Ask students to research the link between salmon and orca populations in this region. How can humans help both species?

Sea Otters (Otter Outlook)

Sea otters are the furiest animals on the planet. How dense is their fur? (*It averages 650,000 hairs per square inch.*) Unlike most other marine mammals, sea otters don't have blubber to insulate them. Their dense fur keeps them warm in the cold waters they inhabit in central California and Alaska.

- Watch the sea otters swim. Do you see bubbles coming out from underneath their fur? Sea otter fur keeps the animal warm by trapping a layer of air close to the skin. If its fur isn't clean and groomed, an otter can't stay warm. What body parts do the otters use to groom their fur? (*Sea otters use their paws to keep their dense fur clean.*)

- Sea otters are among the few animal species that use tools, specifically rocks. What do you think they use rocks for? (*Sea otters use rocks to crack open the shells of abalone and other hard-shelled animals they eat.*)

At SeaWorld...

Orphaned sea otter pups are sometimes brought to SeaWorld for lifesaving care. They require around-the-clock feeding and constant grooming to protect their delicate and dense fur.

Dive Deeper

The California sea otter population is not recovering as much as it should. Research what factors are keeping this population low and how people can help sea otters recover.

Bottlenose Dolphins (Dolphin Point)

Bottlenose dolphins are social animals that live in groups. Though they may look like fish, they are in every way mammals. What are the five main characteristics that dolphins share with other mammals? (*They give live birth, nurse their young, have hair around the snout when in the womb, breathe air, and are warm-blooded.*)

- A dolphin finds food and navigates with the help of echolocation. It produces sounds in its nasal sacs and transmits the sound waves through its melon (forehead). The sound waves bounce off objects around the dolphin and echo back. By interpreting the echo, the dolphin explores its surroundings. Why is echolocation important in the ocean? (*Sight is not always useful in dark or murky ocean waters, so they can “see” with sound.*) What other animals use it? (*Other toothed whales and bats.*)

- SeaWorld trainers work hard to create a fun and enriching environment for the animals. Using the graphics, discover the three basic tools for successful animal training. (*Communication, reinforcement, and target recognition.*)

At SeaWorld...

More than 80 bottlenose dolphins have been born at SeaWorld San Diego since the 1970s. Many of the dolphins you see in this habitat were born here.

Dive Deeper

Many people think it would be fun to interact with dolphins in the ocean. But it's not a good idea—for people or dolphins. As a class, list the reasons.

Visit oceanoday.noaa.gov/dontfeedwilddolphins/ for more information

Beluga Whales (Wild Arctic)

Beluga whales live in the Arctic Ocean and surrounding seas. How do they keep warm in cold waters? (*Belugas have a thick layer of insulating blubber just underneath the skin, which can make up more than 40% of a beluga whale's weight.*)

- Watch the belugas swim. How do they differ from bottlenose dolphins or killer whales? (*Belugas lack a dorsal fin and have unfused neck vertebrae, making them more maneuverable in icy waters. Also, they are all white which helps them blend with their icy environment.*)

- Belugas are so vocal that they are called “sea canaries.” As you observe belugas in the upper viewing area, listen for vocalizations. Why do beluga whales make sounds? (*To communicate with other belugas and to navigate under ice.*)

Dive Deeper

Locate the Cook Inlet on a map of North America (hint: it's located on the coast of the only U.S. state that lies in the Arctic). The population of beluga whales that lives in Cook Inlet was hunted to the brink of extinction. Even though hunting no longer occurs, this population is not growing as much as it should be. Research what factors may be keeping this beluga whale population from recovery.

Walruses (Wild Arctic)

Male walruses can weigh more than 1,500 kg (3,300 lb.). How many 100-lb. students would it take to equal the weight of one 3,300 lb. walrus? (*33 students, $33 \times 100 = 3,300$*)

- Walruses use the 400 to 700 vibrissae (whiskers) on their face to find food. Vibrissae are extremely sensitive and can tell a walrus the size and shape of an object.

Why would they need to use these to find food? (*Clams and other prey items are hard to find in murky and muddy waters.*)

- Can you find a walrus with tusks? Tusks are long, canine teeth. Do you think a walrus uses its tusks for chewing food? (*No. Tusks help a walrus climb onto ice floes. Walruses also use tusks for defense. Male walruses use tusks for establishing dominance over other males.*)

At SeaWorld...

SeaWorld has occasionally received and cared for orphaned walrus calves. The calves were rescued by the U.S. Fish & Wildlife Service in Alaska and would not have been able to survive on their own.

Dive Deeper

During the breeding season and in between feeding trips, walruses rest on land or sea ice. Reduced amounts of sea ice means more and more walruses are using land; use the internet to discover why this is particularly dangerous for female walruses with young calves.

Sea Turtles

A sea turtle is a reptile that spends nearly its entire life in the ocean. Like reptiles that live on land, sea turtles need to breathe air, but they can hold their breath under water for a very long time. A green sea turtle can hold its breath and stay under water for up to five hours.

- A female sea turtle comes ashore to lay eggs. First, she digs a nest with her flippers and then lays up to 200 round, golf ball-sized eggs. She covers the nest with sand and returns to sea. Two months later the baby turtles hatch, dig their way out of the sand, and crawl into the sea. Can you guess how big a sea turtle hatchling is? (*Sea turtle hatchlings are only a couple of inches long.*)

- Some sea turtle species eat plastic bags floating in the water, mistaking them for food. Eating plastic can make sea turtles sick and can even be fatal. What ocean animal might look like a plastic bag? (*jellyfish*)

At SeaWorld...

SeaWorld's Rescue Team has cared for nearly 2,100 rescued sea turtles. Some of the sea turtles are tracked by researchers at SeaWorld and Hubbs-SeaWorld Research Institute with satellite transmitters when they are returned to the ocean.

Dive Deeper

Did you know that sea turtles may accidentally become entangled in trash that washes into their ocean home? Have your class organize or participate in a local beach or waterway clean up. Visit OceanConservancy.org to learn how.

Bat Rays (Manta)

Bat rays are a type of fish with a skeleton made of the same substance as a shark's. Do you remember what a shark's skeleton is made of? (*Sharks and rays have skeletons made of cartilage.*)

- Like many other ocean animals, bat rays are countershaded with darker dorsal (upper) surfaces and lighter ventral (underneath) surfaces. How does this camouflage help rays? (*When viewed from above, a ray's dark dorsal side blends in with the darker ocean depths. When viewed from below, the lighter ventral surface blends in with the brighter sea surface.*)
- Bat rays are benthic animals: they rest and feed on the bottom of the ocean. Where is a bat ray's mouth? (*On the underside of its body.*) Where are its gill slits? (*Rays have gills on the underside of their bodies, unlike sharks which have gill slits on the sides of their head.*)

At SeaWorld...

Bat rays are a type of stingray; they are born with sharp venomous spines on their tails. They use these to defend themselves from animals that might try to eat them. At SeaWorld, aquarists clip down the rays' spines to protect us from being stung. Ask a SeaWorld Educator how to avoid being stung by a stingray while at the beach.

Dive Deeper

We enjoy many of the same foods that marine animals, like bat rays, need to survive (clams, fish, etc.). Overfishing can damage fish and shellfish populations and even entire ecosystems. Research "sustainable seafood" to learn how it protects various species of aquatic animals and their habitats.

Tide Pool

Touch a sea urchin. What do you think these animals use their spines for? (*Protection, movement, and burrowing.*) To burrow into rocks, sea urchins wear down the surface with their spines and pull away bits of rock with their tube feet.

- Find a snail. Did you know that snails have a foot? Their foot is a flat, broad muscle that they use to glide along surfaces to move. Their foot also sticks to rocks and other surfaces.
- What other animals can you find? Ask the Educator to tell you more about them.

At SeaWorld...

The water in the pool is 10.6 to 11.1°C (51–52°F). The water in this habitat and nearly all animal habitats at SeaWorld comes from Mission Bay; it is filtered and treated to remove contaminants before it enters animal habitats. Before water re-enters the bay, it is treated and tested again to ensure that it is as clean or cleaner than it was when it entered our system.

Dive Deeper

The animals in this habitat are familiar residents of the rocky shores off San Diego's coast. Plan a visit to a tide pool when the tide is at its lowest. Use a newspaper, tide table, or the internet to figure out the best time to go. When tide pooling, leave rocks and animals where they are, and just quietly watch to see what happens in these miniature oceans.

Sharks

- A shark is a type of fish that has no bones. Its skeleton is instead made of cartilage. We have cartilage in our bodies, too. Where? (*In our ears and noses.*)
- Of the more than 400 shark species, very few species have attacked people. In fact, shark attacks are very rare. Can you think of two reasons a shark might attack a human? (*To defend their territory or investigating a human as potential prey.*)
- Sharks are excellent hunters. Their senses guide them to their prey. What are our five senses? (*Smell, touch, sight, hearing, taste.*) What are a shark's other two senses? (*A lateral line system for sensing water movement and ampullae of Lorenzini to sense weak electrical fields.*)

At SeaWorld...

Sharks don't eat much. On average they consume 1% to 10% of their body weight in an entire week (an amount that a dolphin might eat in a single day!). Our aquarists feed some sharks just three times a week.

Dive Deeper

Each year, humans catch millions of sharks mostly for their valuable fins, the key ingredient in shark fin soup. Many people feel that this is not a problem since they believe that all sharks are dangerous. Yet very few shark species are dangerous to humans. Have your students research why sharks are an important part of their ocean ecosystems and what is currently happening to shark populations. Discuss whether sharks pose a larger threat to humans or humans to sharks.

Sea Lion Point

- Seals and sea lions are similar animals. They are both pinnipeds. What is a pinniped? (*A group of mammals that includes seals, sea lions, fur seals, and walruses.*)
- Look at an animal's ears. Sea lions have small external ear flaps. True seals have a tiny opening for the ear on each side of the head, but no ear flap. Find and point at a sea lion. Now find and point at a seal.
- Watch how seals and sea lions move on land. Seals inch forward in a caterpillar like motion. How does a sea lion move on land? (*Using all four flippers to "walk"*)
- Watch the seals and sea lions swim. Do they swim differently? (*Yes. A sea lion uses its front flippers up-and-down like paddles; a seal uses its hind flippers in a back-and-forth motion.*)

At SeaWorld...

Each year, SeaWorld's Rescue Team rescues ill, injured, or orphaned seals and sea lions from San Diego County beaches. They provide care for these animals with the goal of returning them to sea. If you're at the beach and spot an animal you think needs help, let a lifeguard or park ranger know. You can also call the SeaWorld Rescue Hotline at (800) 541-SEAL.

Dive Deeper

What are some other types of wildlife that may need to be rescued? As a class, make a list of some of the reasons that these animals might need to be rescued and cared for. Which reasons are caused by humans? How can we protect wildlife from these human-caused dangers?

Flamingos

- Flamingos filter food like flies and brine shrimp out of the water by hanging their head upside-down in the water, and then sweeping their heads from side-to-side. Can you spot any feeding flamingos?
- What color is a flamingo? (*pink*) Flamingos obtain their color from pigments in the food they eat. What do you think would happen to the flamingos' feathers if they didn't eat pinkish foods? (*Without their regular diet, flamingo feathers would grow in white or gray.*)
- Do you see a flamingo standing on one leg? Flamingos do this to keep warm. One leg keeps them standing, while the other leg is close to the body staying warm. Do you ever stand in a particular way to stay warm? (*People sometimes stand with arms crossed and legs together to maintain body heat.*)

At SeaWorld...

Do you see any mud mounds in the habitat? During nesting season, keepers add mud for the flamingos to build their nests. After a few weeks, eggs hatch and gray chicks can be seen on top of the mounds until they are big enough to join the colony.

Dive Deeper

These flamingos are pinioned—portions of their wings were removed—so they can't fly away. Why is that important? Flamingos are not native to California. If released here, flamingos could damage San Diego habitats and compete with native wildlife. Research more about exotic versus native species.