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SEAWORLD EDUCATION PROGRAMS

FIELD TRIP GUIDE



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Thank you

for participating in your SeaWorld
instructional field trip program today.

SEAWORLD

FIELD TRIP GUIDE

WELCOME TO SEAWORLD!

Why are beluga whales called sea canaries? What is an endangered animal? What is a pinniped? Discover the answers to these questions and more by visiting as many animal attractions as possible.

Ask students the questions from this guide to learn about animals — their adaptations, their habitats, and conservation issues. Encourage your students 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**” conservation challenge at the bottom of each page. Encourage students to research the answers at school, at home, at the library, or on the Internet and share their results with the class.

This guide supports National Science Education Standards.

Enjoy your SeaWorld Field Trip!

PENGUIN ENCOUNTER

INSIDE PENGUIN ENCOUNTER

- ✧ Penguins are birds — they can't fly in the air, but they can "fly" through the water! Watch penguins swim. What body part do they use for swimming? (*flippers*)
- ✧ Brrrr! 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 penguins, are up to 1.1 m (3.7 ft) tall and weigh up to 41 kg (90 lb.). Can you find an emperor penguin?

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.*)

SHAMU'S SECRET

Inside the Penguin Encounter, SeaWorld penguin keepers simulate the seasonal light changes in the southern hemisphere, where these birds are from. When it is summer in San Diego, the building lights are dimmed because it is winter in Antarctica and dark nearly 24 hours a day.

DIVE DEEPER

Both cold- and warm-weather penguins are affected by global climate change. As we use fossil fuels such as coal, oil, or gas for energy usage carbon dioxide (CO_2) is released into Earth's atmosphere. Instead of heat escaping from the atmosphere, this build-up of CO_2 traps in heat like a blanket surrounding the Earth. How can this excess heat affect penguins that need sea ice? Penguins that live in warmer climates?

WALRUSES AT 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? (*It would take 33, 100-lb. 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.*)
- ✧ You may see 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 their tusks for defense. Male walruses use their tusks for establishing dominance over other males.*)

SHAMU'S SECRET

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

The United States has laws that protect different animals. Walruses are protected by the 1972 Marine Mammal Protection Act, which bans commercial hunting of marine mammals, allowing only native subsistence hunting. In your school library or online, find out which animals are protected by law in your state.

POLAR BEARS AT WILD ARCTIC

- ✧ An *adaptation* is a body part that helps an animal survive in its environment. Name two adaptations that polar bears have for surviving in the icy Arctic. (*They have a thick coat and fat layer for insulation, their white color provides camouflage in the snow and ice. Small bumps on their footpads keep them from slipping on ice. Their sharp claws help them catch seals.*)
- ✧ Polar bears eat ringed seals and bearded seals, but occasionally eat fishes, bird eggs, berries, and plants. What senses do polar bears use to find their prey? (*Polar bears use their eyesight, hearing, and especially their sense of smell to find prey. A polar bear can smell a seal from more than 1 km (0.6 mi.) away and 1 m (3 ft.) under the snow.*)

SHAMU'S SECRET

Polar bears are great hunters. The Wild Arctic Team hides fish, fruits, vegetables, and bear biscuits in hidden feeder tubes to encourage the bears to hunt.

DIVE DEEPER

Polar bears and other arctic animals are affected by loss of sea ice due to climate change. When we burn fossil fuels such as gas to drive cars, extra carbon dioxide is released into Earth's atmosphere and acts like a blanket, trapping heat. This warms the air and oceans, melting away sea ice more rapidly. Brainstorm ways your class can help to reduce carbon emissions.

PUFFINS (INSIDE PENGUIN ENCOUNTER)

- ✧ Puffins live on the opposite end of the world from penguins, in the Northern Hemisphere.
- ✧ How are puffins like penguins? (*Both are birds that have, feathers and a beak.*) How are they different? (*Puffins can fly and penguins cannot.*)
- ✧ Both tufted and Atlantic puffins have brightly colored plumage (feathers and markings) during the spring and summer nesting season and duller plumage over winter. By looking at the puffins' plumage, can you tell what season it is?

SHAMU'S SECRET

The cliff edge in this exhibit is similar to the habitat that wild tufted puffins nest in along the rocky coasts and offshore islands of the Pacific Northwest. Within the rockwork, a series of caves are set up with nest boxes inside. Bird keepers prepare each nest box and open them to the puffins for nesting season which begins in late spring.

DIVE DEEPER

The SeaWorld & Busch Gardens Conservation Fund has awarded grants to Project Puffin—a National Audubon Society sponsored seabird conservation program off the coast of Maine. Because of the efforts of Project Puffin, populations of Atlantic puffins and other seabirds that nest in the Gulf of Maine are recovering. What are some things that humans do that can cause declines in seabird populations?

TURTLE REEF

- ✧ 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 as long as 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 newly hatched sea turtle is? (*Baby sea turtles are only a couple of inches long when they hatch.*)
- ✧ 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*)

SHAMU'S SECRET

SeaWorld has cared for nearly 2,000 rescued sea turtles. Some of the sea turtles are tracked by SeaWorld and the Hubbs-SeaWorld Research Institute with satellite transmitters when they are returned to the wild.

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 www.oceanconservancy.org to learn how.

BELUGA WHALES AT WILD ARCTIC

- ✧ Belugas 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, killer whales, and other whales you've seen today? (*Belugas lack a dorsal fin and have unfused neck vertebrae making them more maneuverable. These body features let belugas easily swim beneath ice floes. Also, belugas are all white which helps them blend in with their icy environment.*)
- ✧ Belugas are so vocal that they are sometimes called "sea canaries." Find the sound box and listen to beluga vocalizations. Belugas don't have vocal cords. How do they make sound? (*They move air in the nasal sacs, below the blowhole.*) Why do belugas make these sounds? (*Communication with other belugas and navigation.*)

SHAMU'S SECRET

Notice a smaller, grayer beluga whale? There are two young beluga whales, Pearl and Atla, both born in 2010. Beluga calves are gray when they are born and eventually lighten to the white coloration of the adults.

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 Cook Inlet population of beluga whales was hunted to the brink of extinction. Even though hunting no longer occurs, this beluga population is not growing as much as it should be. Research online what factors may be keeping this beluga population from recovering.

SHAMU CLOSE UP

- ✧ Killer whales are the largest dolphin species. How do they resemble bottlenose dolphins? How are they different? *(Bottlenose dolphins and killer whales share a similar body shape; flippers, flukes, and fins; a blowhole; etc. They differ in color; in the length of their rostrum (snout), and in size.)*
- ✧ Killer whales feature two types of camouflage. They are countershaded: the top of their body is dark and the underside is light to blend in with ocean waters from above or below. They also feature disruptive coloration: their dark body is broken up by white patches, making them appear smaller. Why would killer whales need camouflage? *(To conceal themselves from potential prey.)*
- ✧ Can you hear the killer whales making any noises? Where on your body does your voice come from? *(vocal cords in your throat.)* Killer whales do not have vocal cords like we do. They produce all the sounds that they make under their blowhole area.

SHAMU'S SECRET

Just like people, killer whales have doctors too. SeaWorld has veterinarians on staff to keep killer whales and the other animals healthy. A whale check-up is similar to the way a human doctor checks 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

If fishes swim and feed in polluted waters, contaminants can build up in their bodies. A killer whale who eats these fish may build up an even greater load of contaminants. Because they feed at the top of the ocean food chain, killer whales are very susceptible to pollution. How can we keep our oceans clean?

SHARK ENCOUNTER

- ✧ A shark is a type of fish that has no bones. Its skeleton is made of cartilage. We have cartilage in our bodies, too. Where? *(In our ears and noses.)*
- ✧ Of the more than 400 different species of sharks in the world, only 12 have ever attacked people. In fact, shark attacks are very rare. Can you think of two reasons a shark might attack a human? *(Sharks may attack to defend their territory or they may be investigating if a human is 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 the ampullae of Lorenzini to sense weak electrical fields.)*

SHAMU'S SECRET

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 potentially dangerous to humans. Have your students find out why sharks are an important part of their ocean ecosystems and what is currently happening to shark populations. Then discuss whether sharks pose a larger threat to humans or humans to sharks.

SEALS & SEA LIONS AT PACIFIC POINT

- ✧ Seals and sea lions are similar animals. They are both pinnipeds. What is a pinniped? (*Pinnipeds are a group of mammals that includes seals, sea lions, fur seals, and walruses.*) Seals and sea lions have many differences that help us distinguish between the two.
- ✧ 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 their head, but no ear flaps. 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 caterpillarlike motion. How does a sea lion move on land? (*A sea lion walks using all four flippers.*)
- ✧ Watch the seals and sea lions swim. Do they swim differently? (*Yes. A sea lion swims using its front flippers like paddles. A seal swims by moving its hind flippers back and forth through the water.*)

SHAMU'S SECRET

Each year, SeaWorld's Animal Rescue Team rescues ill or injured 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 a marine mammal you think needs help, let a lifeguard or park ranger know or contact the local marine mammal rescue organization. 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 we can protect wildlife from from these human-caused dangers?

OTTER OUTLOOK

- ✧ Sea otters are the furriest 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. 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, 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 that they eat.*)

SHAMU'S SECRET

As part of Monterey Bay Aquarium's Sea Otter Research and Conservation program, 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 on the internet to find out what's keeping their population low and how people can help sea otters recover.

AQUARIA TOUCH POOL

- ✧ Touch a sea urchin. What do you think these animals use their spines for? (*Sea urchins 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 broad, flat 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.

SHAMU'S SECRET

The water in the pool is 10.6 to 11.1°C (51–52°F). No wonder your hands feel so cold when you reach into the water! The water in this habitat comes from Mission Bay, but it is filtered and treated to remove contaminants. Before filtered water re-enters the bay, it is treated and tested to ensure that it is as clean as or cleaner than it was when it entered our system.

DIVE DEEPER

The animals in this touch pool 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 what time would be 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.

BAT RAYS AT 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 can this help camouflage the ray? (*When viewed from above, a ray's dark dorsal 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.*)

SHAMU'S SECRET

Bat rays are a kind 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. But don't worry! Here, the SeaWorld aquarists clip back the rays' spines to protect us from being stung. Ask a SeaWorld Educator how to avoid being stung by a stingray when at the beach.

DIVE DEEPER

We enjoy some 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 online about how choosing to eat only sustainable seafood protects various species of aquatic animals and their habitats.

DOLPHIN POINT

- ✧ Bottlenose dolphins are social animals that live in groups. Though they may look a bit 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 sound 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. What other animals use echolocation? *(Bats use echolocation.)*
- ✧ SeaWorld trainers work hard to create a fun and enriching environment for animals. Using the graphics, discover the three basic tools for successful animal training. *(Communication, reinforcement, and target recognition.)*

SHAMU'S SECRET

More than 70 bottlenose dolphins have been born at SeaWorld San Diego since the 1970s. Many of the dolphins you see in this pool were born here.

DIVE DEEPER

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

FLAMINGOS

- ✧ Flamingos filter food like flies and brine shrimp out of the water by hanging their heads 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 sometimes stand on one leg 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.)*

SHAMU'S SECRET

Notice any mud mounds? During the nesting season, keepers add mud for the flamingos to build their mound-shaped 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. Use the library or Internet to find out more about exotic versus native species.