

LEVELED BOOK • X



Whale Sharks: Giant Fish



Written by Kira Freed

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Focus Question

How do the unique features of the whale shark help it survive?



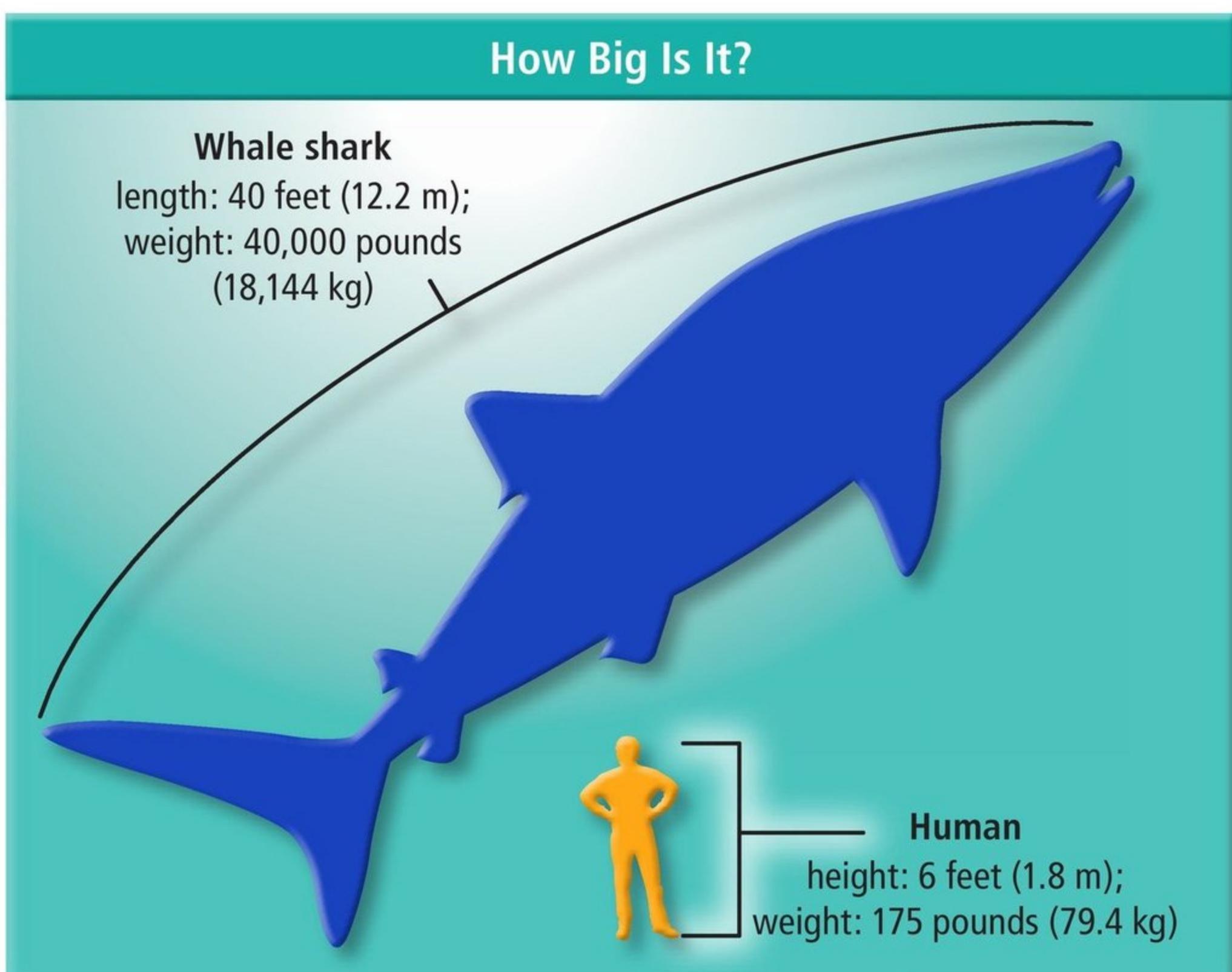
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A Whopper of a Fish

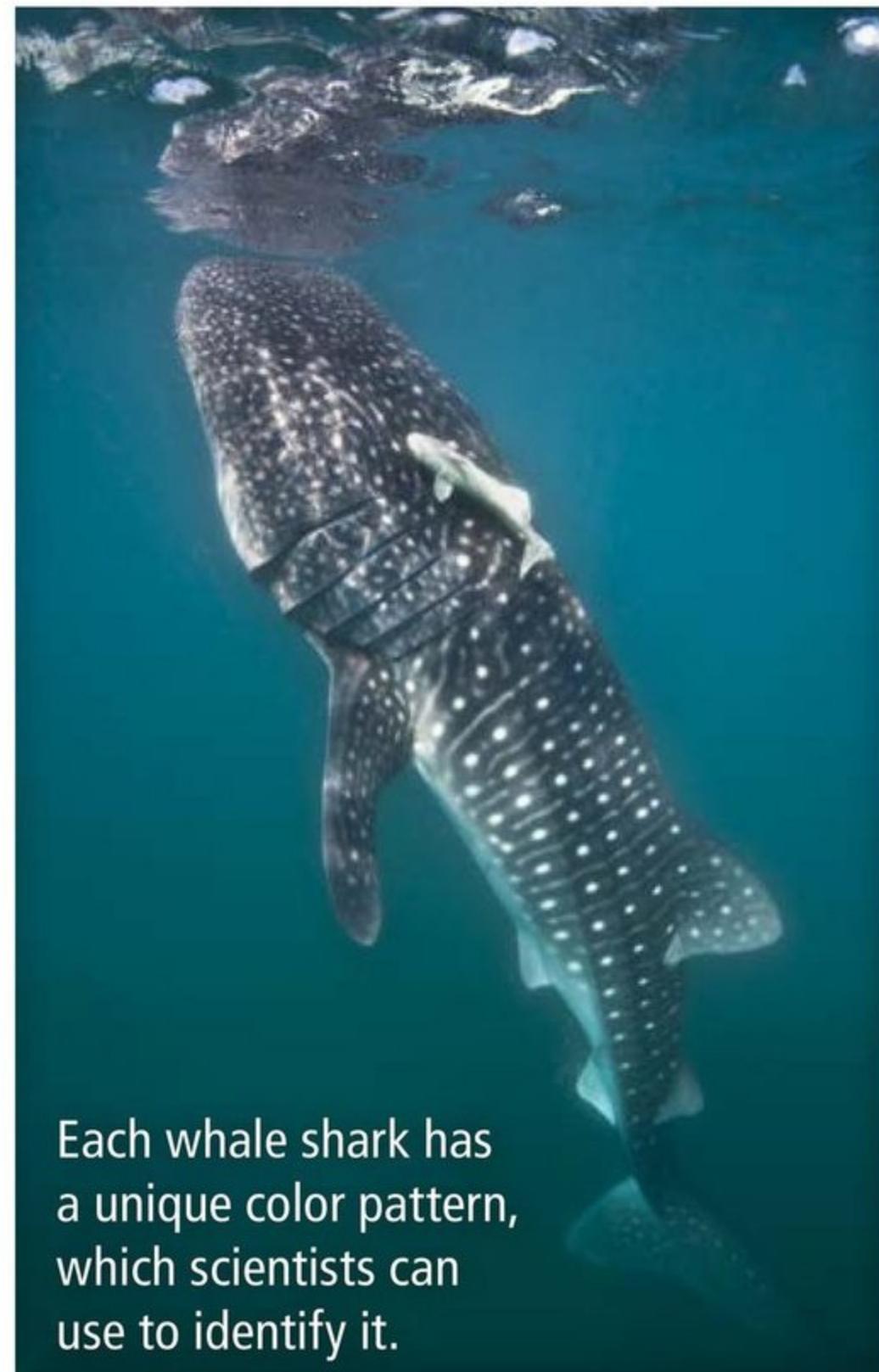
You're snorkeling off the western coast of Australia when you suddenly notice an enormous dark shape swimming up from the depths. As it gets closer, you realize that it's a shark the size of a school bus. Your heart pounds wildly in your chest. Scared? There's no need to be—it's a whale shark!

Whale sharks are the biggest fish in the world, but big doesn't always mean dangerous. These creatures are so peaceful that people can safely swim beside them. Swimmers often describe them as elegant and majestic. Still, there's no denying the fact that whale sharks are giants among animals.



Huge Checkerboard

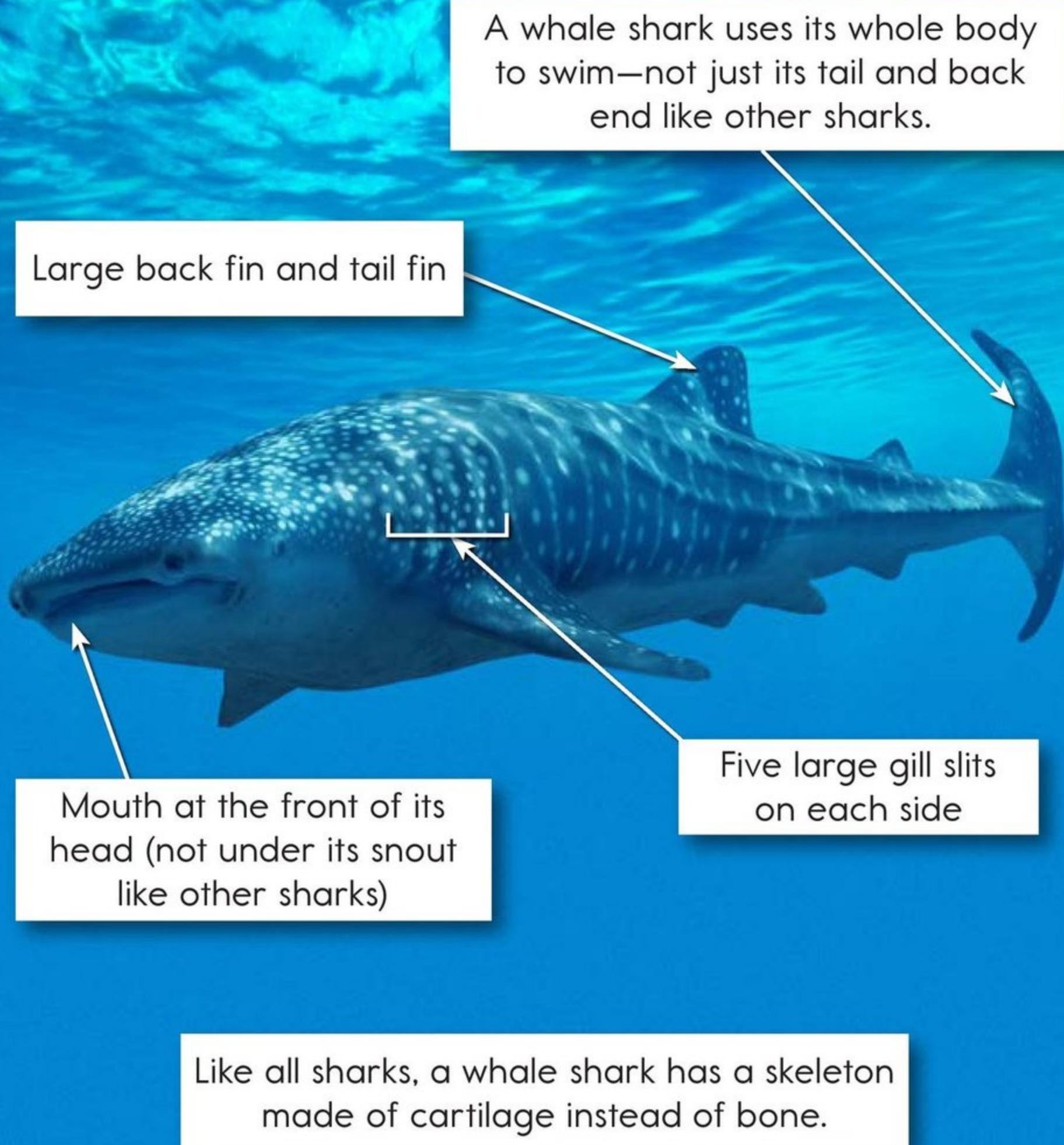
If you've ever seen a whale shark in the wild or in photographs, you're not likely to mistake it for any other type of fish. A whale shark has a wide, flat head and a blunt **snout** with a gigantic mouth. It often swims with its mouth open.



Each whale shark has a unique color pattern, which scientists can use to identify it.

Like other sharks, whale sharks have rough skin and sharp scales, which are called *dermal denticles* ("skin teeth"). Their back is dark—bluish, grayish, or brownish—with a **distinctive** pattern of light-colored spots and stripes often described as similar to a checkerboard or domino. Scientists don't know the purpose of this unusual color pattern. Some think it might help shield whale sharks from too much sunlight at the water's surface. Others think the pattern may be for camouflage, but adults are so large that **predators** are rarely a problem. However, the color pattern may keep young whale sharks safe by helping them blend in with their surroundings.

What Makes a Whale Shark a Fish?



Most fish

- have a backbone
- breathe with gills
- live in water
- have tails and paired fins
- are cold-blooded
- have scales
- lay eggs

Out to Sea

Whale sharks live in tropical and warm **temperate** regions of the Atlantic, Pacific, and Indian Oceans. They swim in the open ocean as well as close to shore. They are often seen swimming at the surface, and they also dive as deep as 6,000 feet (1,829 m). They're strong swimmers but are slow compared to the fastest shark, the shortfin mako, which speeds along at over 30 miles per hour (48 kmph). Whale sharks can swim for long distances at a rate of 2.4 miles per hour (3.9 kmph).

Whale sharks are usually **solitary** but are often seen with remoras—a type of fish with a sucker-like structure—attached to their body. Whale sharks may also travel with groups of large fish that have similar feeding habits.



Remoras help keep whale sharks free of parasites and get food and protection in return.

Where Whale Sharks Live



Whale sharks **migrate** long distances, although the reasons aren't clear. The behavior could be related to breeding, finding food, or other reasons. Migrations are commonly more than 1,240 miles (2,000 km) long. One whale shark was recorded migrating 8,077 miles (13,000 km) over a period of more than three years.

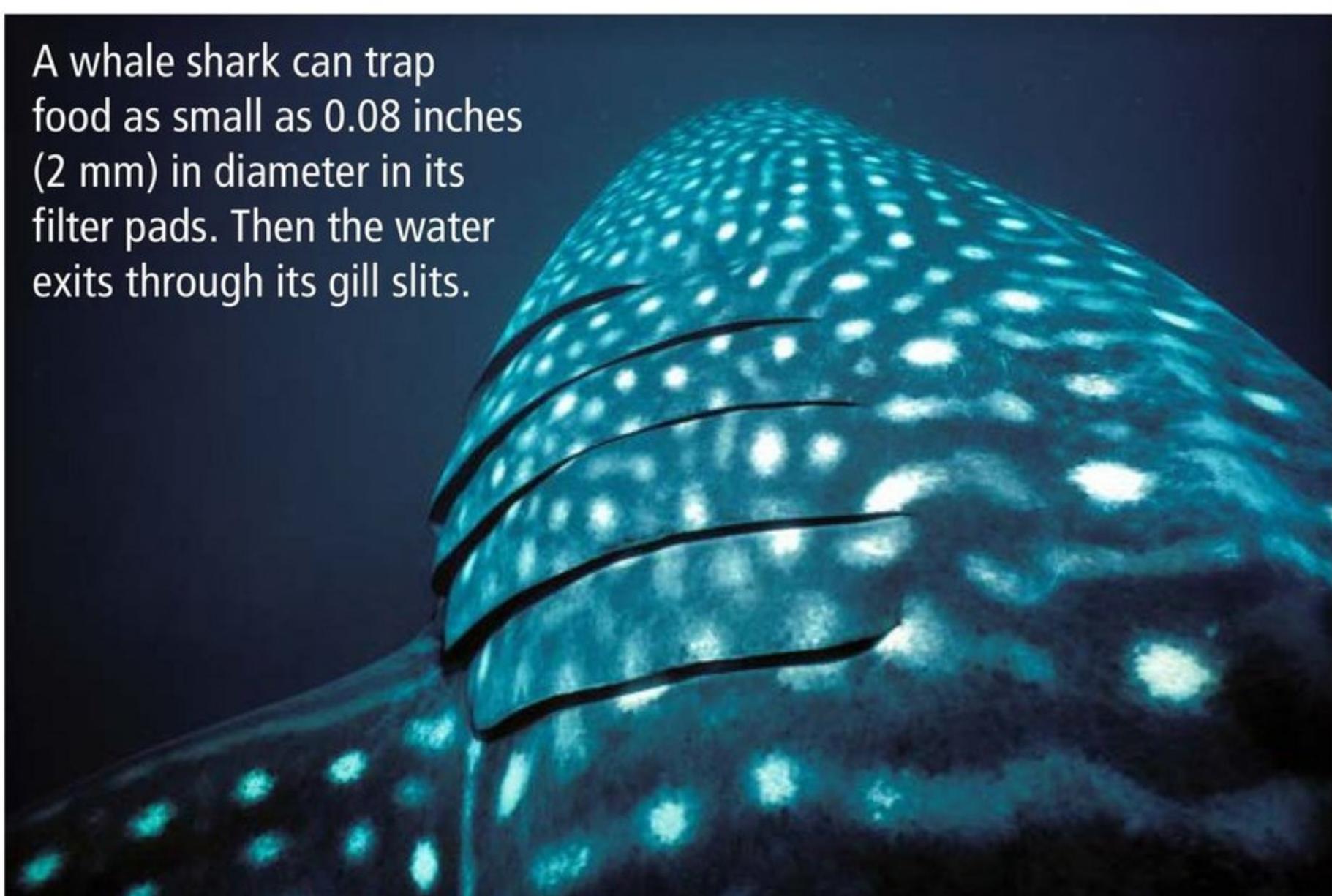
Whale sharks gather all over the world in places called **aggregation** sites. The largest, called the *Afuera* (Spanish for “out” or “outside”), is located off the coast of Mexico’s Yucatan Peninsula. Over four hundred whale sharks have been observed there at the same time, feeding on large quantities of fish eggs. Another large group was seen swimming near coral reefs in the Red Sea. Scientists study these gatherings to learn more about whale shark behavior, including where these huge fish feed and breed.

Huge Fish, Tiny Food

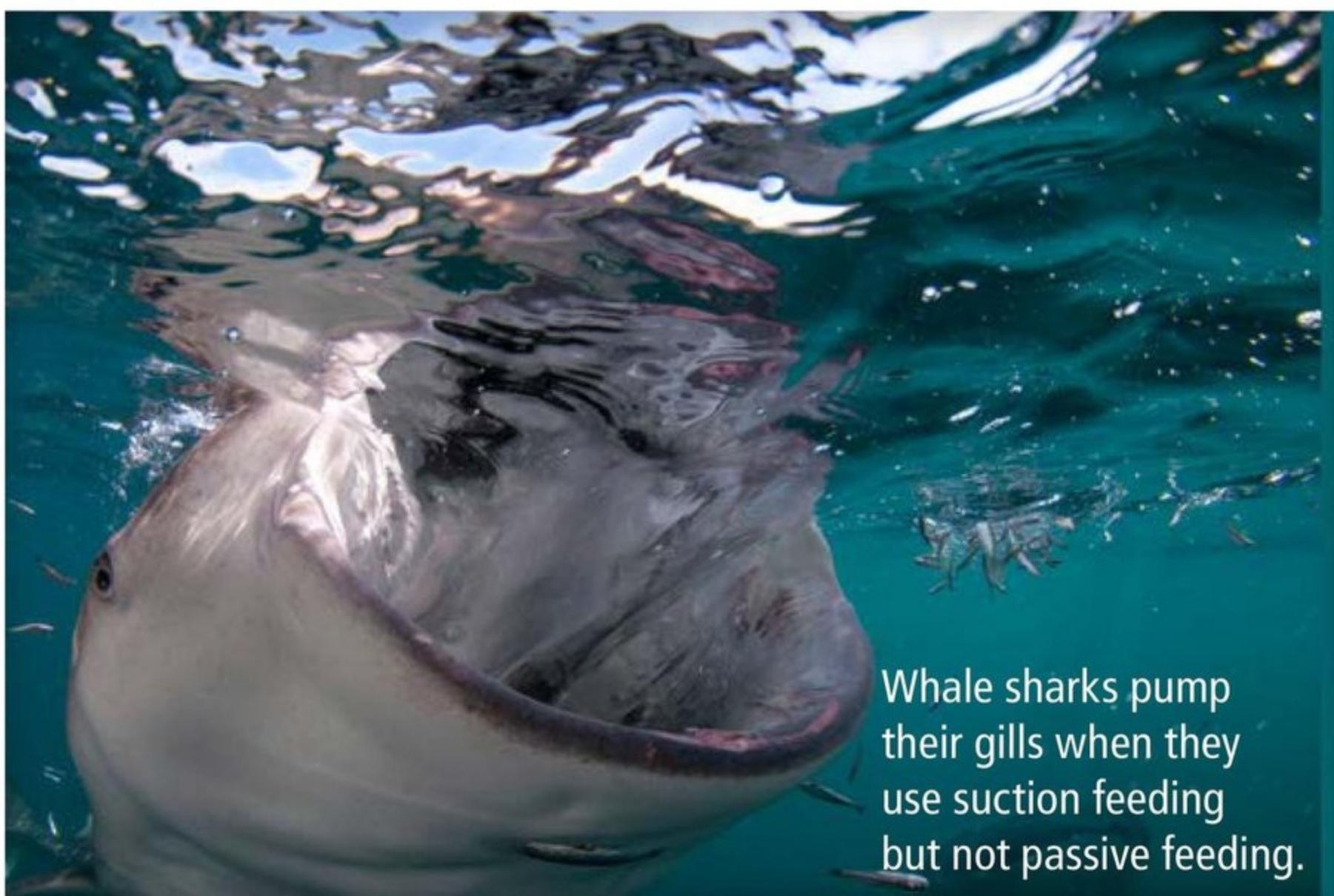
Whale sharks are different from most other sharks in that they don't actively hunt for food and are not considered predators. They eat **plankton**—microscopic ocean animals and plants that drift in the water. Another food source is micronekton—tiny animals that can swim. Krill, which are similar to shrimp, are a favorite food of whale sharks. They may also eat small fish, squid, plants, fish eggs, and occasionally larger fish such as tuna.

Whale sharks eat using a process called *filter feeding*. When they open their mouth, the ocean water carries in various types of food. As the water flows toward their gills, five pairs of spongy filter pads trap the small animals and plants. Then the water flows out through their external gill slits.

A whale shark can trap food as small as 0.08 inches (2 mm) in diameter in its filter pads. Then the water exits through its gill slits.



Filter feeding in whale sharks involves one of two main strategies. **Passive** feeding, also known as ram feeding, is a calm activity in which a whale shark swims with its mouth open and its head bobbing from side to side. With passive feeding, a whale shark swallows anything that flows in, including ocean trash. It can turn its stomach inside out through its mouth to get rid of the trash.



Whale sharks pump their gills when they use suction feeding but not passive feeding.

Suction feeding, similar to using a vacuum cleaner, involves sucking or gulping in large amounts of water. This type of feeding is useful when a high density of food is present. In that case, it's possible for a whale shark to take in too much food at once. If it does, it may cough to clear out any excess that builds up on its filter pads.

Wowser!

- A whale shark's open mouth can measure 5 feet (1.5 m) wide—large enough to fit a person!
- The largest whale shark ever measured was 66 feet (20 m) long. That's as long as one and a half school buses.
- A whale shark can filter an amount of water equal to that in an Olympic-sized swimming pool (650,000 gallons, or 2,460,517 liters) in four hours.

Groups of whale sharks have been seen feeding at the ocean's surface at sunset or after dark, when plankton are plentiful. Whale sharks probably find their food by smell. Scientists determined this by looking at the placement of a whale shark's nostrils and eyes. The nostrils are located near the top of the mouth, close to a whale shark's food source. The tiny eyes are farther back on the head, which suggests that they play a less important role in finding food.



A whale shark has 300 rows of tiny teeth, but it doesn't use them for eating.

Babies and Adults

An adult whale shark may be twenty-five times as long as a newborn.



Giant Puppies

Scientists once thought that whale sharks laid eggs. Then, in 1995, they discovered that whale sharks give birth to live babies. A pregnant female that died had more than three hundred babies, or pups, growing inside her. The growing sharks were 16 to 24 inches (42–63 cm) long. Some were more developed than others, so they would have been born sooner.

Whale shark **reproduction** is different from human reproduction in an important way. Whale shark babies do not share a blood supply with the mother and do not get nutrients directly from her. Instead, each one is enclosed in an egg case with an egg yolk to nourish it before birth. When a pup is full-grown, it breaks out of its egg case, after which the mother gives birth to it. As soon as it's born, a pup is mature enough to survive on its own.

Whale shark pups look like adult whale sharks except for their smaller size. No one has ever observed a whale shark birth, so scientists can only speculate about the event. They suspect that whale sharks give birth in the open ocean rather than near shore. Newborn pups grow more quickly than older juveniles, and females grow more quickly than males and are larger when full-grown. Whale sharks reach maturity at around thirty years of age. No one knows how long they live, but sharks as a group live for a long time. Because of whale sharks' large size, scientists think they could live for one hundred years.



Two snorkelers swim alongside a juvenile whale shark in Mexico's Sea of Cortez.



A whale shark skims the ocean's surface to feed on plankton in West Papua, Indonesia.

Staying Alive

Whale sharks are hunted for their meat, skin, fins, and liver oil. They are easy to hunt because they often swim near the water's surface, and they're vulnerable to collisions with ships for the same reason. In addition, whale sharks are often caught by accident when people are fishing for other species. Pollution, destruction of their habitat, and factors related to climate change are additional threats to whale sharks.

Whale sharks are not yet **endangered**, but they are classified as "**vulnerable**"—in danger of becoming endangered. Some countries have placed limits on the numbers of whale sharks that can be hunted in order to try to protect them from further decline. In addition, ecotourism is helping call attention to the value of these animals as one of Earth's treasures.



Baitfish form a tight school around a whale shark to stay safe from predators.

Mega Fish

You're snorkeling again—this time in the Gulf of Mexico. As an enormous whale shark swims near, you have no fear. You watch in wonder as it opens its mouth—as wide as a bicycle is long—and sucks in ocean water. You observe its huge gill slits pumping as it collects tiny ocean food. You marvel at the elegance of this enormous creature and understand what a privilege it is to see this gentle giant up close.

A Streak of Luck

Whale sharks are a symbol of good luck in Japan. In Vietnam, they're called "Sir Fish" and are prayed to for protection. In Mexico, whale sharks are called "domino" because of the pattern of spots on their body. In Madagascar, the name for a whale shark means "many stars."

Glossary

aggregation (<i>n.</i>)	a group, gathering, or collection of many things or individuals (p. 8)
distinctive (<i>adj.</i>)	having a quality or characteristic that is different and notable (p. 5)
endangered (<i>adj.</i>)	in danger of dying out completely (p. 14)
migrate (<i>v.</i>)	to move from one habitat or region to another at a certain time each year (p. 8)
passive (<i>adj.</i>)	not active (p. 10)
plankton (<i>n.</i>)	tiny plants and animals that live on or near the ocean's surface (p. 9)
predators (<i>n.</i>)	animals that hunt and eat other animals to survive (p. 5)
reproduction (<i>n.</i>)	the process of producing offspring (p. 12)
snout (<i>n.</i>)	the nose and mouth of an animal (p. 5)
solitary (<i>adj.</i>)	single; alone (p. 7)
temperate (<i>adj.</i>)	having mild temperatures (p. 7)
vulnerable (<i>adj.</i>)	able to be hurt easily (p. 14)

Words to Know

aggregation
distinctive
endangered
migrate
passive
plankton

predators
reproduction
snout
solitary
temperate
vulnerable

Front and back cover: Swimming with whale sharks is popular in places where these huge creatures gather.

Title page: A whale shark hunts for food near the ocean's surface in Oslob, Cebu, Philippines.

Page 3: A lucky snorkeler swims with a whale shark near the northwest coast of Australia.

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Giants of the Animal World
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