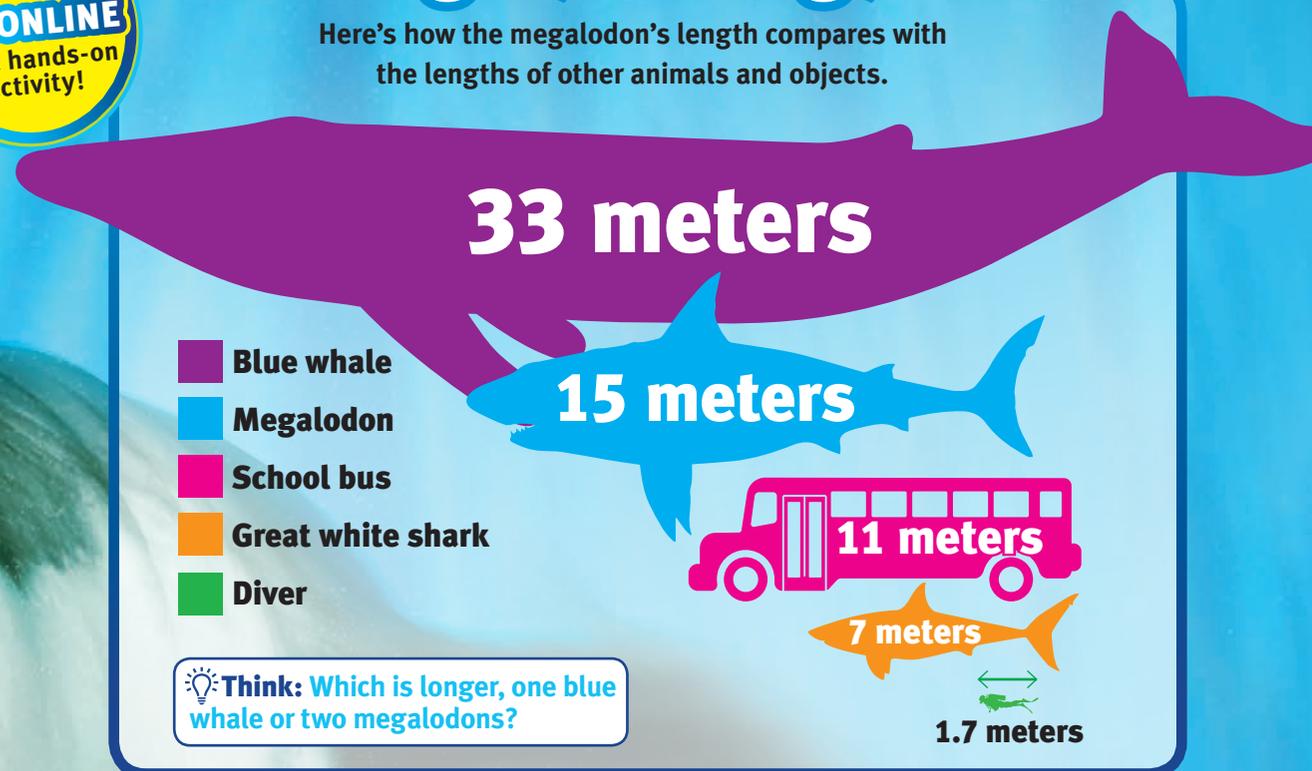




# How Big Was the Megalodon?

Here's how the megalodon's length compares with the lengths of other animals and objects.



» As you read, think about how fossils form and what information they provide to scientists.

# The MIGHTY Megalodon

## Scientists study fossilized teeth to size up a giant shark!

**SKYE BASAK IS UP TO HER** elbows in mud. After hours of digging, she pries loose a stone, revealing a shark tooth that's 16 centimeters (6 inches) long. A tooth that big could be from just one shark: a giant prehistoric one called a megalodon!

Basak is a **fossil** hunter who runs a company called Palmetto Fossil Excursions in Summerville, South Carolina.

She often shares the fossils she finds with a local museum for research. Megalodon teeth are some of Basak's favorite fossils to dig up. They can be three times as large as those of great white sharks!

Kenshu Shimada is a scientist at DePaul University in Chicago who studies fossils

to learn about prehistoric life. In recent years, he has used megalodon teeth, like the ones Basak finds, to better understand this massive fish!

### Back in Time

Megalodons lived around the globe between 15 million and 3.6 million years ago. They spent

time in tropical waters along coastlines and used sawlike teeth to feed on large fish, seals, and whales. Scientists have



Kenshu Shimada

found whale fossils with big bite marks that likely came from the giant sharks!

Scientists think the megalodon's jaws had more than 200 teeth lined up in rows, explains Shimada. As



Both sharks' teeth have jagged edges for ripping through food.

the sharks fed on other animals, these teeth often fell out. This happens to today's sharks too.

When a megalodon lost a tooth, it sank to the ocean floor and was covered by **sediments**.

# How Shark Teeth Became Fossils

Fossils of shark teeth are common, but fossils of other shark body parts are rare. Here's how the teeth of prehistoric sharks turned into fossils.

1



Millions of years ago, a shark died. Its body sank to the ocean floor.

2



Sediments such as sand and silt quickly covered the body. Over time, the sediments turned into rocks.

3



Meanwhile, the shark's soft cartilage decayed. Minerals seeped into the teeth and hardened.

4



The rocks became exposed, leaving the fossilized teeth to be discovered!

**Think:** Why do scientists need to use teeth to study prehistoric sharks?

Over millions of years, the sediments turned to rock. At the same time, **minerals** entered the tiny spaces in the tooth and hardened, forming a fossil. Then wind and

## words to know

- fossil**—the preserved remains of a living thing
- sediments**—materials such as silt, sand, or rock that have been moved by water, wind, or glaciers
- minerals**—solid substances that form in rocks
- weathering**—the gradual wearing away of soil or rock

water gradually wore away the rock in a process called **weathering** (see *How Shark Teeth Became Fossils*, above).

Megalodon teeth have been found on every continent except Antarctica. But fossils of other shark body parts are rare. Teeth are made out of hard, bone-like material. But shark skeletons are made of cartilage, the same tissue the tip of your nose and the outer parts of your ears are made from. Cartilage is much softer than teeth. It usually breaks down before it can become a fossil.

## Just How Big?

Megalodons were giants of the ocean. But without fossils of megalodon skeletons, scientists don't know exactly how big they were. Many researchers have calculated their size by comparing megalodon teeth with great white shark teeth. Because of similarities in the sharks' teeth and diets, scientists assume that megalodons' bodies grew in much the same way that great whites' do. "The two sharks are like distant cousins," says Shimada.



Fossil hunter Skye Basak carefully digs for shark teeth in South Carolina.

BACKGROUND ILLUSTRATION BY GARY HANNA; KATE FRANCIS (SIDEBAR ILLUSTRATIONS); PALMETTO FOSSIL EXCURSIONS (SKYE BASAK); ALEX MUSTARD/2020VISION/NPL/MINDEN PICTURES (BASKING SHARK); CHRIS AND MONIQUE FALLOWS/NPL/MINDEN PICTURES (MAKO SHARK); JULIAN K. FINN/MUSEUMSVICTORIA (GOBLIN SHARK)

In 2019, Shimada used great white shark teeth to estimate the length of the megalodon. He found that the sharks could reach at least 15 meters (50 feet)—more than twice as long as a great white!

The next year, Shimada's team learned that megalodons were far larger than their extinct relatives. To find the lengths of these ancient sharks, Shimada looked at the sizes of living sharks that belong to the same group as the extinct sharks and megalodons (see *The Meg's Relatives*, right). After the megalodon, the next-longest shark in the group was just 7 meters (23 feet) long.

In Shimada's newest study, in 2021, he used fossilized teeth to calculate that megalodons were giants even at birth—about 2 meters (7 feet) long! In order to grow that large, babies would likely have eaten unhatched eggs inside their

mother! Some modern shark babies eat their own species too, says Shimada.

## More to Discover

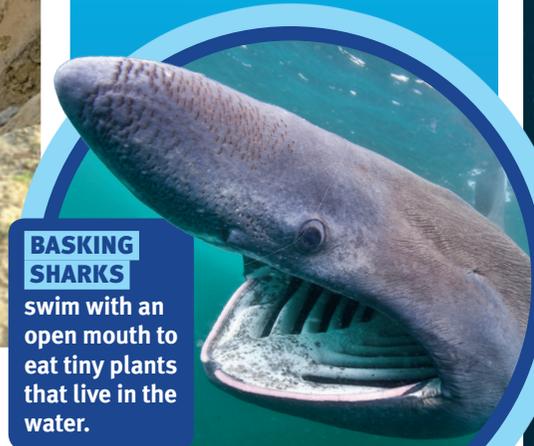
The more scientists learn about megalodons, the better they can understand what the planet was like millions of years ago. "We want to know why the megalodon became so large and why it became extinct," Shimada says.

To find these answers, scientists like Shimada will continue to study fossils to look for clues about the past. Meanwhile, researchers and fossil hunters will keep digging for more megalodon teeth. For Skye Basak, each discovery is exciting! "When you find a fossil, you're the first person on Earth to lay eyes on it or touch it," she says.

—Dani Leviss

# The Meg's Relatives

Based on fossil evidence, these living sharks belong to the same group as megalodons.



## BASKING SHARKS

swim with an open mouth to eat tiny plants that live in the water.



## MAKO SHARKS

are the fastest sharks alive, reaching speeds of 46 miles per hour!



## GOBLIN SHARKS

catch prey by thrusting their jaws 3 inches out of their mouths.