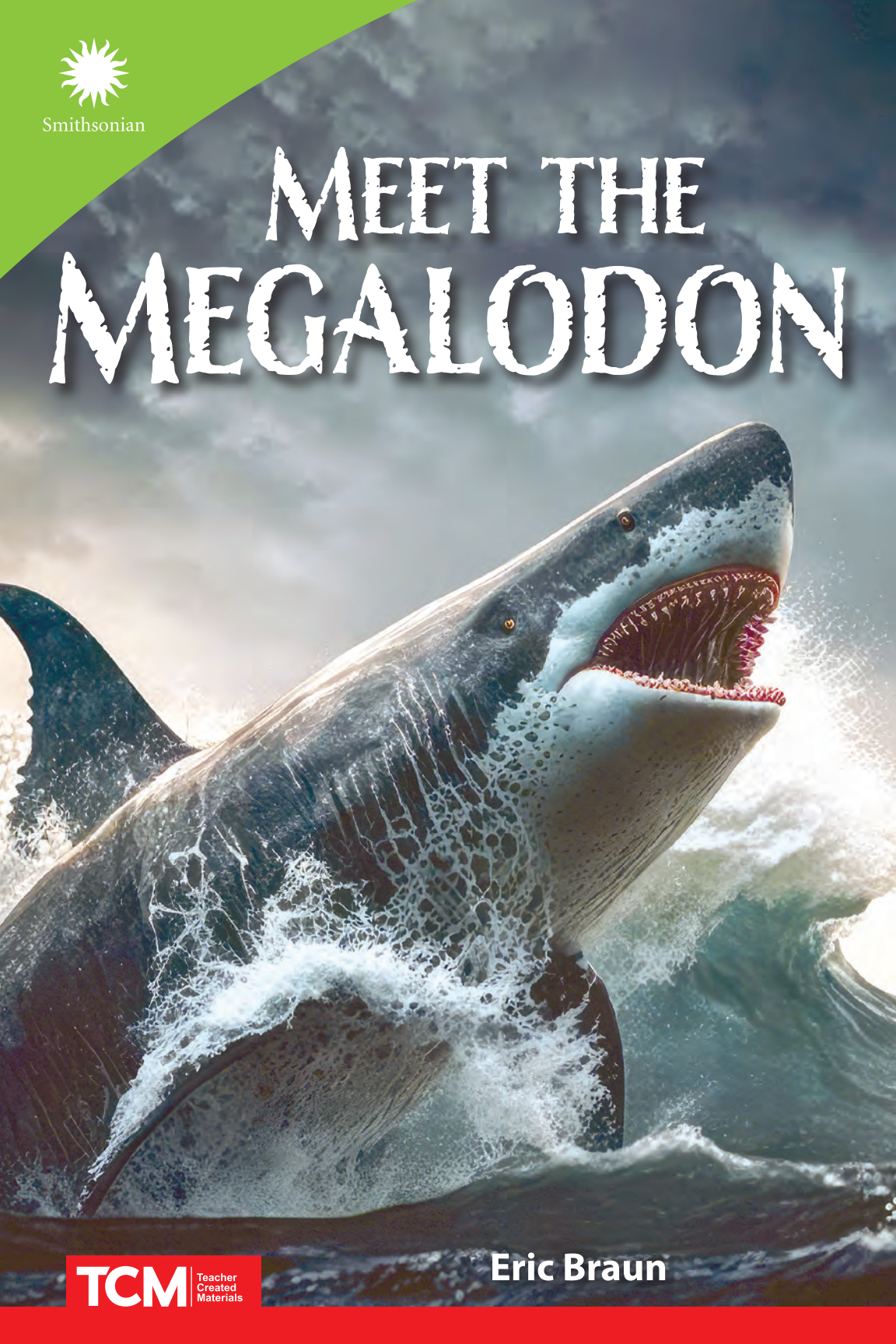
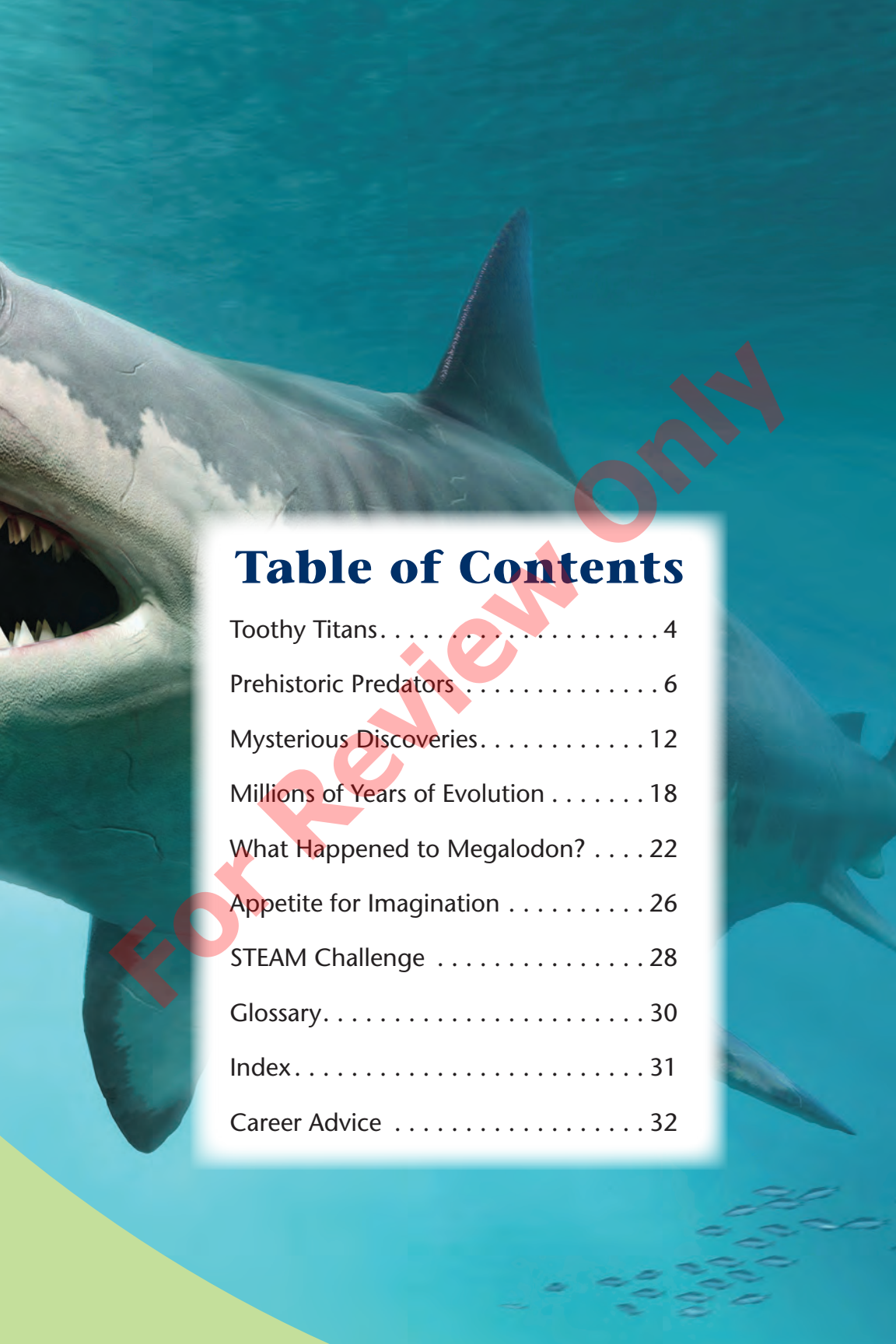
Smithsonian

Meet the Megalodon



Eric Braun

TCM Teacher Created Materials



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Toothy Titans

Imagine coming face-to-face with a massive, mega-toothed shark. This creature is 16 meters (52 feet) long, almost twice as large as a killer whale. It looks down at you with a mouth that is 3 meters (10 feet) wide, big enough to devour you and some of your friends. And just get a glimpse of those teeth. Each one has sharp, jagged edges and is the size of an adult's hand.

This giant fish is a species of shark called *Otodus megalodon*. People usually call these sharks "megalodon." (Fun fact: the word *megalodon* is both singular and plural.) You can see one in person at the National Museum of Natural History in Washington, DC. But it's just a model. It was installed at the museum in 2019.

Megalodon have been **extinct** for millions of years, but in their time, they were some of the fiercest **predators** to ever live. They were the top predators of their time, chowing down on whales, seals, and everything else below them in the food chain.

FUN FACT

The word *megalodon* comes from two Greek words. When translated, those two words mean "giant tooth." Considering the size of their teeth, their name fits them well!

Compared to a great white shark tooth (left), a megalodon tooth (right) is huge!

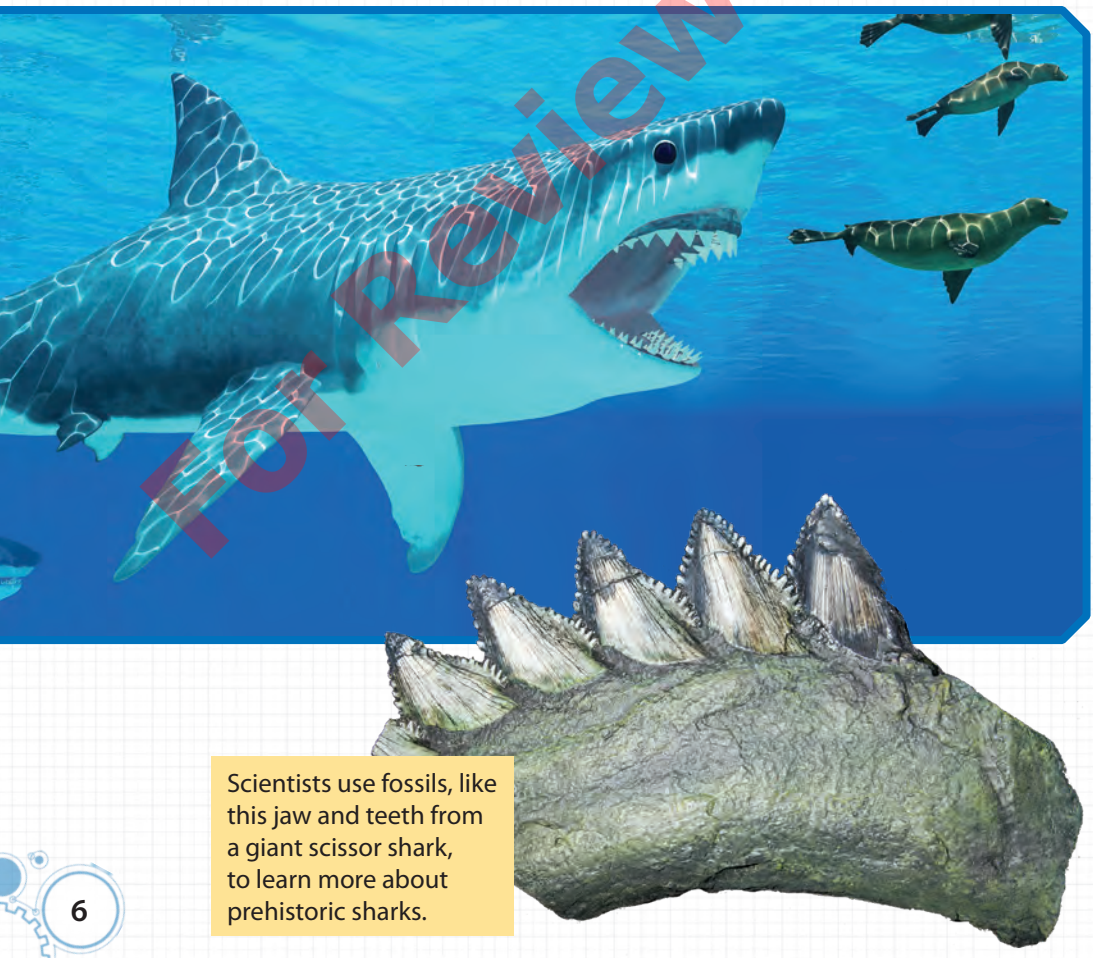
Scientists called ***paleontologists*** have learned about megalodon by studying their fossils. Scientists have discovered how megalodon lived, how they **evolved**, and how they went extinct. There's a lot to unpack about these sharks, so let's dive in!

Museum workers assemble a megalodon model.

Prehistoric Predators

Did you know that sharks have been on Earth for 400 million years? Just like the oceans today, **prehistoric** waters contained different types of sharks. Scientists know this thanks to the **fossil record**.

Megalodon were prehistoric sharks. They first appeared on Earth about 23 million years ago and died out about 3.6 million years ago. During those years, these sharks lived in all the oceans. While they did sometimes swim in deep areas of oceans, they preferred to roam coastal areas. They could even live in smaller **marine** areas, such as lagoons, lakes, and rivers.



Scientists use fossils, like this jaw and teeth from a giant scissor shark, to learn more about prehistoric sharks.

Some prehistoric sharks had teeth that grew in curved clusters.

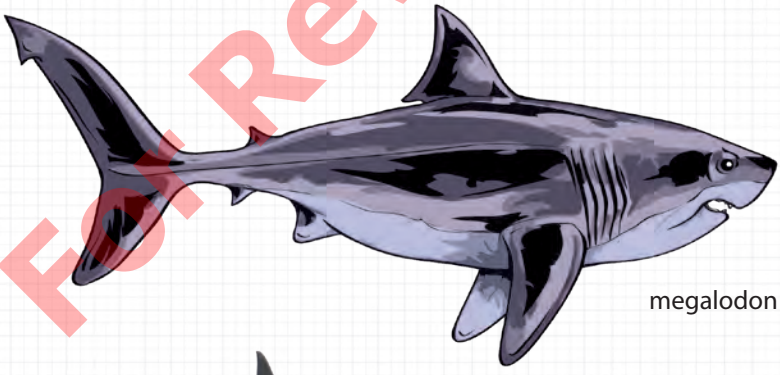
For many years, megalodon have been a fascinating topic for scientists. In the 1800s, a scientist named Louis Agassiz was the first person to describe them. He believed they were related to great white sharks. That's because both species have similar looking, **serrated** teeth. Over time, scientists have debated how to **classify** megalodon. Today, they are classified separately from great whites. Scientists believe that they are in a different family, which is a collection of many species. They think great white sharks lived alongside megalodon until megalodon became extinct.

What Did They Look Like?

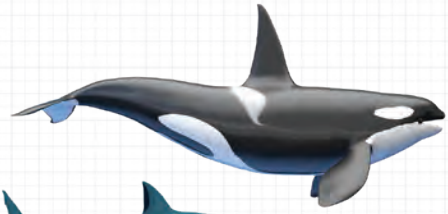
Without seeing megalodon in the flesh, no one can know exactly what they looked like. But, thanks to fossils, scientists have some good ideas.

Scientists estimate that megalodon were the largest sharks to ever live. They could grow to be about 16 meters (52 feet) long. That's almost as big as a semi-truck and its trailer. Megalodon were roughly three times bigger than great white sharks and twice as big as orcas. Megalodon likely weighed up to 45 metric tons (50 tons). And newborn megalodon may have been about 2 meters (6.6 feet) long. That is longer than the height of an average adult male!

semi-truck



megalodon



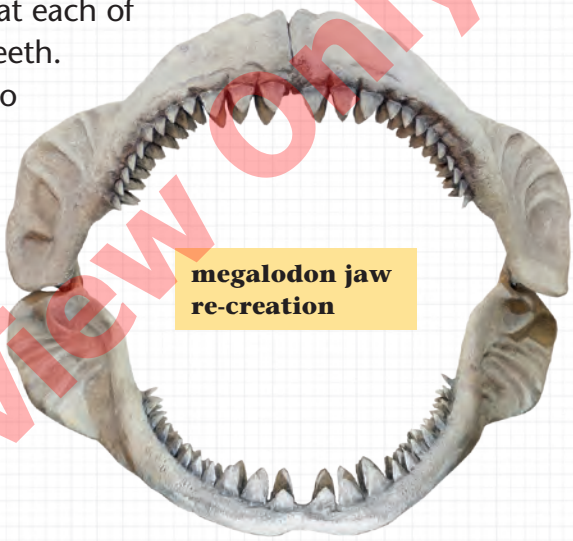
orca

great white shark

average adult male

Megalodon shared some physical similarities with other sharks. They had powerful, **streamlined** bodies. Their bodies allowed them to move through the water quickly and easily. Beneath their skin, their skeletons were made mostly of **cartilage**. That's the same material that makes up your nose and ears. Megalodon were also able to swim long distances without getting too tired.

The most striking feature of megalodon were their mouths. Scientists think that each of their jaws held about 276 teeth. Their mouths could be up to 3 meters (11 feet) wide. Compared to great white sharks, megalodon had shorter noses and flatter jaws. They continuously shed their teeth as they wore out and grew new ones.

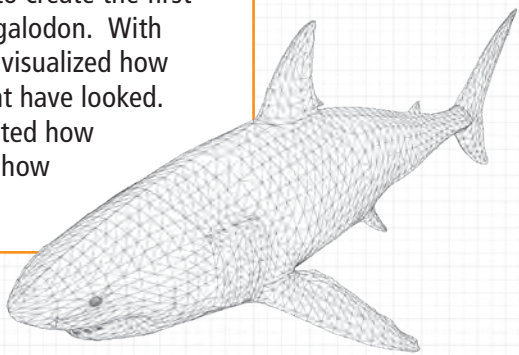


megalodon jaw re-creation

TECHNOLOGY

Computer Modeling

In 2022, scientists used part of a backbone fossil to create the first 3D model of megalodon. With this model, they visualized how megalodon might have looked. They also estimated how they moved and how fast they swam.



STEAM CHALLENGE

Define the Problem

Paleontologists dig deep to uncover clues about Earth's history. They visit sites and use tools to find all types of fossils. Your task is to design and build a sifting tool to help them look for fossils and ancient artifacts. Your tool must allow space for sand and sediment to move through while holding onto larger objects, such as shells and rocks.

Constraints: You may only use the materials provided to you.

Criteria: Your sifting tool must be able to collect at least five larger objects from a sand sample. The tool must also allow sand and sediment to move through.

CAREER ADVICE
from Smithsonian

Do you want to study ancient life?

Here are some tips to keep in mind for the future.

"Why do horses have four legs, but people have two? What was Earth like before insects existed? When did the first predator eat its first prey? Paleontologists try to answer questions like these because they are curious about the history of life more than any other topic. If this sounds like you, keep feeding your curiosity! Take all the geology and biology classes that you can. Keep reading, always ask questions, and never stop learning."

– Kathy Hollis, Collections Manager, Department of Paleobiology, National Museum of Natural History

"Becoming a paleontologist requires solid training in biology and geology. In college, aspiring paleontologists usually major in either field but should take courses in the other. It is important for students to go out into the field with experienced people who will teach them how to recognize, document, and collect fossils. Most jobs in paleontology now require graduate training."

– Dr. Hans Sues, Senior Research Geologist and Curator of Vertebrate Paleontology, Department of Paleobiology, National Museum of Natural History

Read and Respond

1. What is a predator, and how do megalodon fit that description?
2. What physical features helped megalodon thrive in the oceans?
3. How have sharks changed as they have evolved over millions of years?
4. What are some theories as to how megalodon became extinct?
5. Why do you think scientists study extinct species?
6. If megalodon were alive today, what effects would they have on the oceans?