

Shark School

Send your kids to shark school to learn the facts about the most feared of all sea creatures—the shark.

Shark Myth-buster

Sharks existed long before humans. Scientists estimate they have been on this earth for more than 400 million years—some 200 million years before the days of the dinosaurs! In spite of their long history, however, sharks are among the world's most misunderstood creatures, largely because so much misinformation has been promoted through the media. Determine what kids already know about sharks and dispel any myths with the Shark Myth-buster quiz. Duplicate the quiz and have kids color the shark symbol for each statement they think is true. Use this as the introduction to your unit.

No Bones About It

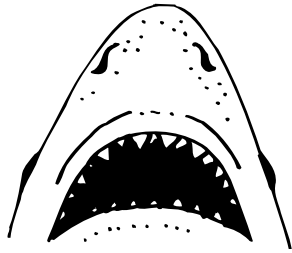
Although they share the sea with many other fish and sea creatures, sharks are very different than most fish. One of the biggest differences is their skeleton. They don't have any bones in their bodies! A shark's skele-

ton consists of a tough, flexible substance called *cartilage*. Humans have skeletons made of bone but they also have cartilage in their bodies. Have students touch their nose and ears and then describe what they feel. The human ear and nose are made of cartilage. The shark's flexible skeleton makes it quick and graceful in the water. Most fish have to wiggle their body back and forth to swim. Sharks simply move their caudal fin (the upper part of their tail) from side to side to propel themselves in the water. Their flexible skeleton allows them to swim with amazing grace. Large sharks can even swim as fast as 40 miles per hour! Most fish have only one gill for breathing. Sharks have 5 to 7 gill slits which absorb oxygen from the water. Unlike other fish, sharks have eyelids—three, in fact!...an upper eyelid, lower eyelid, and a transparent eyelid to cover the entire eye. All of these differences make sharks truly unique creatures.

Gotta Swim

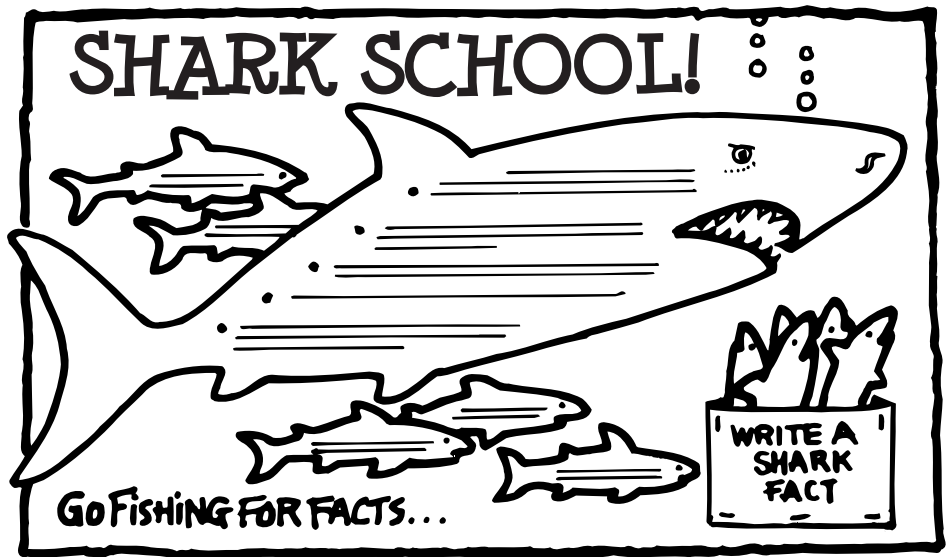
Sharks are cold-blooded animals in that their body temperature is determined by the temperature of the water around them. Most sharks live in temperate or tropical waters. However, there are a few varieties that live in polar seas. Like birds, many sharks travel south toward warmer water in the winter and north toward cooler water in the summer. It is difficult to study sharks in the ocean because they constantly swim around, swim too fast, and dive too deep for divers to keep up with them. Scientists have learned that, unlike other fish, sharks do not have swim bladders. A swim bladder is like a balloon inside a fish and helps it float in the water. Without a swim bladder, a shark must always swim in an upward direction. If it stops swimming, the shark will sink. Sharks do, however, have oil-rich livers. The oil acts as a float. To demonstrate this concept for your students,

try a simple experiment. Add a few drops of oil to a glass of water. What happens? Kids will observe that the oil floats on the water. In this same way, oil in a shark's liver helps keep it afloat.



Toothy Sharks

Unlike people, sharks go through thousands of teeth in a lifetime. Their teeth come in different shapes and sizes, depending on their use...gripping, cutting, or chewing. Some sharks, such as the dangerous great white shark, has a bite 300 times stronger than that of a human. The jaws of the great white are so strong, in fact, that they can bite through steel! These sharks do not chew, though. They rip and tear apart larger prey, while smaller prey are eaten whole. After a good meal, sharks may not eat again for a month or more. It should be noted that rarely does a great white shark eat humans. If it attacks, the shark probably thinks it has come upon its favorite food—a sea lion or seal. Only about 100 shark attacks occur each year worldwide, and most people live to tell about it. By no means are all sharks predators. Surprisingly, the biggest sharks in the world—whale sharks—eat only *plankton*, which are tiny plants and animals that drift in the sea. The whale shark has hundreds of tiny teeth in its mouth but doesn't use them for biting. It merely filters the plankton into its mouth through the teeth. Did you know that sharks even have small teeth on their skin? These tiny teeth are called *denticles*. If you rubbed across the shark's skin, you could cut your finger!



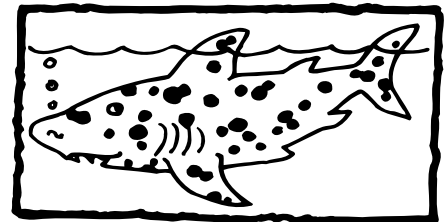
Shark Wall

Share shark facts with your class through a special bulletin board. Cover the board with blue paper. Then, on a large sheet of grey paper, draw or enlarge a shark shape. Write the facts inside the shark shape and add the words "Shark School—Go Fishing for Facts." Duplicate a supply of shark shapes to place in a pocket attached to the board. Have kids write their favorite fact on a shark shape. Better yet, encourage students to do their own research to discover a *new* shark fact. Have them write it on the shark shape and attach it to the bulletin board around the large shark.

Shark Names

Many sharks are named after the color of their skin...blue shark, grey reef shark, great white shark, lemon shark. Other sharks are named after wild animals because of the markings on their skin...zebra shark, tiger shark, leopard shark. The most unusual looking shark of them all may be the hammerhead shark. Its body is streamlined like most other sharks, but its head is shaped like a hammer with an eyeball at each end. There are lantern sharks, which are luminescent or glow in the dark, and sawsharks with long, flat snouts edged with needle-

sharp teeth. Strangest of all may be the goblin shark, which has a long, dagger-like snout above its beak-shaped jaw. Share pictures of these different types of sharks and challenge students to create a name and illustration for a newly-discovered shark. How about a Dalmatian shark with spots, a lion shark with a mane, or a colorful rainbow shark?

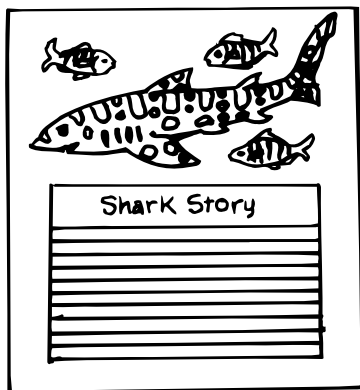


Mom and Pup

Most sharks give birth to their babies live. The baby sharks are called *pups*. Lemon, blue, and bull sharks are born live. Others—swell, cat, and horn sharks—lay their eggs outside their body in tough, leathery cases. None of the shark mothers cares for her young. The pups are on their own from the moment they are born. But sharks that lay eggs often lay them in protected areas where they will be hidden from predators. For example, cat sharks often lay their eggs in seaweed and horn sharks hide their spiral egg cases in the cracks of rocks. This promotes survival of their species.

Shark Friends

Not everyone fears sharks. Sharks have found a companion in a small fish called the remora. Remoras have special suckers on the top of their heads with which they attach themselves to the bodies of certain sharks such as the leopard shark. The remora gets a free ride and a chance to eat some of the food the leopard shark hunts. In return, the remora eats any parasites that are stuck to the shark's skin. Small, striped green fish called pilot fish are also allowed to tag along with sharks. Scientists initially thought that pilot fish guided the sharks toward food. Now they think the pilot fish swim nearby because the shark provides protection from other predators. Reproduce the three fish on page 6. Talk about the relationships between these fish, and encourage children to write a story about them. Attach each story to a large piece of art paper and ask students to color and cut out the fish and glue them to the art paper above the story. Take time to share the stories and post them on the wall with the title "You Gotta Have Friends."



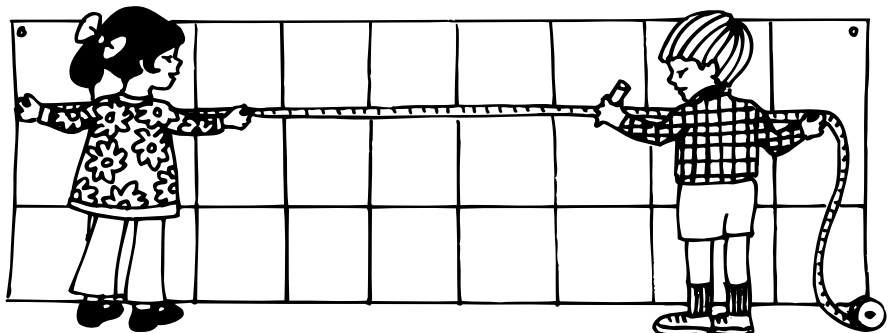
Sixth Sense

Few animals can locate prey and track it down as well as sharks. They have a tremendous sense of smell. Some sharks can smell one part blood in 100 million parts of water! Sharks also have a great sense of hearing. Some can detect the sound of

prey swimming 3000 feet away. Well suited to the underwater world, sharks' eyes have a mirror-like surface which helps them see in dim light. Sharks have a sense of touch like humans but they can also sense vibrations of other animals in the water. A line of small holes along the shark's body picks up even the smallest movement in the water. As if that is not amazing enough, some sharks even use an extra "sixth" sense to locate prey. Hundreds of tiny pores in their head pick up electrical signals that all living things give off as they breathe or move. The electrical signals guide the shark to its prey at close range. No wonder the shark is one of the best hunters in the world!

Shark Playground

Here's an exercise that gives your students practice in grid-making, proportion, and measurement. It also results in a spectacular shark drawing. You can draw the shark on your playground or on 10-foot length of Kraft paper. If you want to create a 20-foot great white shark, just double the measurements. The reproducible grid shows that one inch equals one foot. Show your class how grids help to draw objects in proportion. Divide students into small groups. Duplicate a copy of the shark grid for each group. Cut apart one of the grid sheets and assign one grid square per group. Then follow the steps to make your grid. You'll need a large tape measure, a wallpaper chalkline, and chalk.



1. Have one student stand on each end of a tape measure on the playground or large paper. Use a chalkline to mark off an area 10 feet by 3 feet.
2. Measure one foot from the 10' line and create another line inside the rectangle. Continue marking lines one foot apart until you have filled the area.
3. Create cross lines at one-foot intervals across the 10' lines. You have created a line grid.
4. Number the grid to look like the shark grid pattern.
5. Have each group use chalk to sketch their portion of the shark onto the grid.

Shark Lady

Kids will be intrigued with the primary-level biography of scientist Eugenie Clark, who has devoted much of her life to the study of sharks. Read aloud *The Shark Lady* by Ann McGovern (Scholastic) and find out how humans observe sharks safely. One of Dr. Clark's discoveries involved a natural shark repellent. She found that a fish called the Moses sole, found in the Red Sea, produces a milky, toxic fluid when attacked. When a shark tastes this substance, it spits the fish out! This means scientists may be able to create a shark repellent for swimmers.

Shark Bites

Just for fun, create a shark treat for your class. Slice up a roll of refrigerator cookies. Use a pizza cutter to make a bite-size cut out of each cookie. Bake the cookies as directed and serve up your "shark bites."

Shark Myth-buster Quiz

Color the shark if the fact is true.

Put an X over the shark if the fact is false.



A shark is a kind of fish.



Sharks are different sizes, shapes, and colors.



The first sharks lived 400 million years ago.



All sharks are bigger than people.



There are about 350 different kinds of sharks.



Sharks like to feed on people.



Sharks grow thousands of teeth during their lifetime.



Sharks have scales and bones like other fish.



Sharks will sink if they stop swimming.



All sharks are mean and dangerous.



Shark babies are called pups.

Shark Books

FICTION

Don't Eat the Teacher!

by Nick Ward (Cartwheel)

NON-FICTION

Sharks

by Seymour Simon
(HarperTrophy)

Hungry, Hungry Sharks!

by Joanna Cole (Random)

A Sea Full of Sharks

by Betsy Maestro (Scholastic)

Sharks

by Gail Gibbons (Holiday)

Sharks: Eyewitness Books

by Miranda Macquitty (DK)

Sharkabot: A Sea Of Sharks from A to Z

by Ray Troll (Westwinds)

Surprising Sharks

by Nicola Davies (Candlewick)

Shark Attack!

by Cathy East Dubowski (DK)

A FEW SHARK FACTS

- Sharks have a skeleton made of cartilage, not bone.
- The great white shark is the most dangerous shark.
- The tiny dwarf shark can fit in the palm of your hand.
- The whale shark can measure 60 feet in length and weigh 20 tons—that's as big and heavy as a trailer truck!
- There are more than 350 different kinds of sharks.
- The earliest known shark lived more than 400 million years ago—200 million years before dinosaurs.
- Sharks do not have scales like other fish. Their bodies are covered with tiny thornlike points called denticles or skin-teeth.
- Sharks live in both tropical and temperate ocean waters. They usually swim alone.
- The blue shark, great white shark, grey reef shark, and lemon shark are named for the color of their skin.
- When a great white shark attacks a swimmer, it probably mistakes him for its favorite food—the seal or sea lion.
- A special sensing line runs along both sides of a shark's body. It helps to detect prey.
- More people are killed by bee stings each year than by sharks.
- People kill millions of shark each year for food, fertilizer, leather, jewelry, cosmetics, and medicine.
- Sharks need to swim at all times because they do not have a swim bladder like other fish.

Shark Fact Patterns

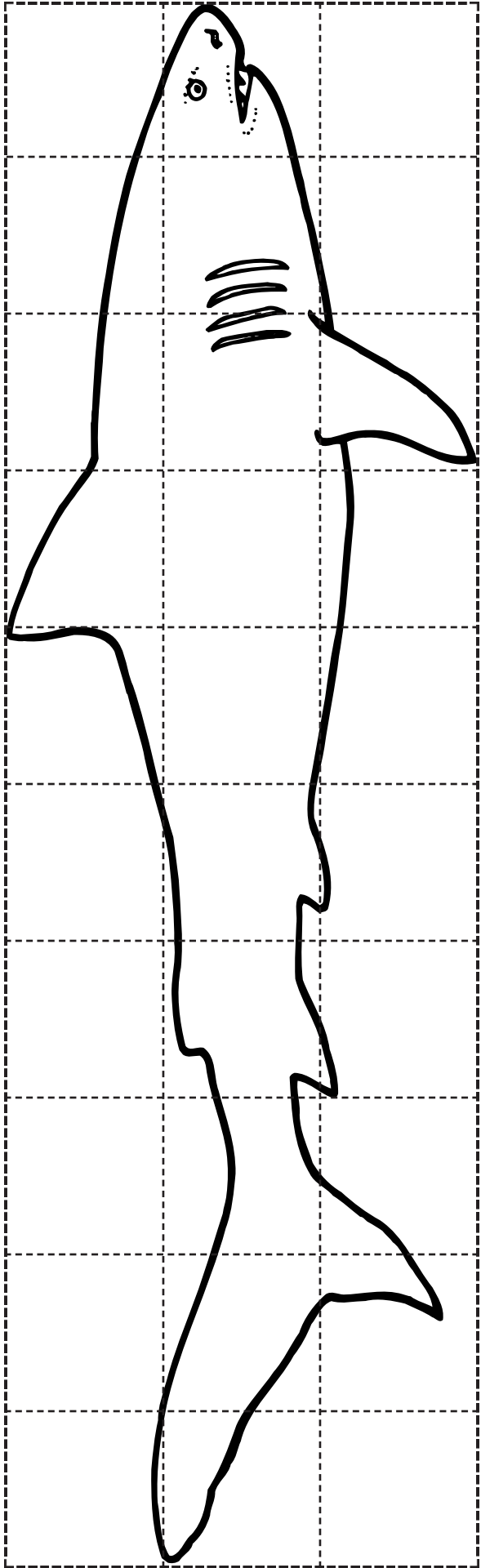
Use a copy machine to enlarge patterns before duplicating for shark facts.

Basking Shark



Hammerhead Shark

Great White Shark Grid



Shark Friends

Color and cut out the fish, shells, coral, and seaweed. Glue above shark story mounted on a 12" x 18" sheet of blue construction paper. See "Shark Friends" on page 3.

