

## 1: California Marine Sportfish Identification: Sharks

*Identifying free-swimming sharks in the wild isn't easy. It requires knowledge, experience, and a willingness to look for details. Unfortunately, underwater lighting is subdued and a cruising shark will rarely remain long in any one place, thus reducing visible contrast and the time available to gather clues useful for identification.*

**Shark tooth** The teeth of tiger sharks are oblique and serrated to saw through flesh Shark teeth are embedded in the gums rather than directly affixed to the jaw, and are constantly replaced throughout life. Multiple rows of replacement teeth grow in a groove on the inside of the jaw and steadily move forward in comparison to a conveyor belt ; some sharks lose 30, or more teeth in their lifetime. The rate of tooth replacement varies from once every 8 to 10 days to several months. In most species, teeth are replaced one at a time as opposed to the simultaneous replacement of an entire row, which is observed in the cookiecutter shark. The teeth of plankton-feeders such as the basking shark are small and non-functional. Sharks and other cartilaginous fish skates and rays have skeletons made of cartilage and connective tissue. Cartilage is flexible and durable, yet is about half the normal density of bone. It has a layer of tiny hexagonal plates called " tesserae ", which are crystal blocks of calcium salts arranged as a mosaic. Generally sharks have only one layer of tesserae, but the jaws of large specimens, such as the bull shark, tiger shark, and the great white shark, have two to three layers or more, depending on body size. The jaws of a large great white shark may have up to five layers. **Fins** Fin skeletons are elongated and supported with soft and unsegmented rays named ceratotrichia, filaments of elastic protein resembling the horny keratin in hair and feathers. Sharks can only drift away from objects directly in front of them because their fins do not allow them to move in the tail-first direction. This works as an outer skeleton, providing attachment for their swimming muscles and thus saving energy. Caudal fin shapes vary considerably between shark species, due to their evolution in separate environments. Sharks possess a heterocercal caudal fin in which the dorsal portion is usually noticeably larger than the ventral portion. This allows more efficient locomotion among these negatively buoyant cartilaginous fish. By contrast, most bony fish possess a homocercal caudal fin. The tiger shark must be able to twist and turn in the water easily when hunting to support its varied diet, whereas the porbeagle shark , which hunts schooling fish such as mackerel and herring , has a large lower lobe to help it keep pace with its fast-swimming prey. **Physiology** **Buoyancy** Unlike bony fish, sharks do not have gas-filled swim bladders for buoyancy. Instead, sharks rely on a large liver filled with oil that contains squalene , and their cartilage, which is about half the normal density of bone. Sand tiger sharks store air in their stomachs, using it as a form of swim bladder. Bottom-dwelling sharks, like the nurse shark , have negative buoyancy, allowing them to rest on the ocean floor. Some sharks, if inverted or stroked on the nose, enter a natural state of tonic immobility. Researchers use this condition to handle sharks safely. Unlike other fish, shark gill slits are not covered, but lie in a row behind the head. A modified slit called a spiracle lies just behind the eye, which assists the shark with taking in water during respiration and plays a major role in bottom-dwelling sharks. Spiracles are reduced or missing in active pelagic sharks. While at rest, most sharks pump water over their gills to ensure a constant supply of oxygenated water. A small number of species have lost the ability to pump water through their gills and must swim without rest. These species are obligate ram ventilators and would presumably asphyxiate if unable to move. Obligate ram ventilation is also true of some pelagic bony fish species. Here the shark pumps blood to its gills via the ventral aorta artery where it branches into afferent brachial arteries. Reoxygenation takes place in the gills and the reoxygenated blood flows into the efferent brachial arteries, which come together to form the dorsal aorta. The blood flows from the dorsal aorta throughout the body. The deoxygenated blood from the body then flows through the posterior cardinal veins and enters the posterior cardinal sinuses. From there blood enters the heart ventricle and the cycle repeats. Members of the family Lamnidae such as the shortfin mako shark and the great white shark are homeothermic and maintain a higher body temperature than the surrounding water. In these sharks, a strip of aerobic red muscle located near the center of the body generates the heat, which the body retains via a countercurrent exchange mechanism by a system of blood vessels called the rete mirabile "miraculous net". The common thresher and bigeye thresher sharks have a similar mechanism for maintaining

an elevated body temperature. This adaptation prevents most sharks from surviving in freshwater, and they are therefore confined to marine environments. A few exceptions exist, such as the bull shark, which has developed a way to change its kidney function to excrete large amounts of urea. The food moves from the mouth to a J-shaped stomach, where it is stored and initial digestion occurs. This short length is achieved by the spiral valve with multiple turns within a single short section instead of a long tube-like intestine. The valve provides a long surface area, requiring food to circulate inside the short gut until fully digested, when remaining waste products pass into the cloaca. Sharks have keen olfactory senses, located in the short duct which is not fused, unlike bony fish between the anterior and posterior nasal openings, with some species able to detect as little as one part per million of blood in seawater. They are more attracted to the chemicals found in the intestines of many species, and as a result often linger near or in sewage outfalls. Some species, such as nurse sharks, have external barbels that greatly increase their ability to sense prey. Sight Eye of a Bigeyed sixgill shark *Hexanchus nakamurai* Shark eyes are similar to the eyes of other vertebrates, including similar lenses, corneas and retinas, though their eyesight is well adapted to the marine environment with the help of a tissue called tapetum lucidum. This tissue is behind the retina and reflects light back to it, thereby increasing visibility in the dark waters. The effectiveness of the tissue varies, with some sharks having stronger nocturnal adaptations. Many sharks can contract and dilate their pupils, like humans, something no teleost fish can do. Sharks have eyelids, but they do not blink because the surrounding water cleans their eyes. To protect their eyes some species have nictitating membranes. This membrane covers the eyes while hunting and when the shark is being attacked. However, some species, including the great white shark *Carcharodon carcharias*, do not have this membrane, but instead roll their eyes backwards to protect them when striking prey. The importance of sight in shark hunting behavior is debated. Some believe that electro- and chemoreception are more significant, while others point to the nictitating membrane as evidence that sight is important. Presumably, the shark would not protect its eyes were they unimportant. The use of sight probably varies with species and water conditions. The remaining seven species had in addition to rods a single type of cone photoreceptor sensitive to green and, seeing only in shades of grey and green, are believed to be effectively colorblind. The lateral line shows a similar arrangement, and is open to the environment via a series of openings called lateral line pores. This is a reminder of the common origin of these two vibration- and sound-detecting organs that are grouped together as the acoustico-lateralis system. In bony fish and tetrapods the external opening into the inner ear has been lost. Electromagnetic field receptors ampullae of Lorenzini and motion detecting canals in the head of a shark Electroreception Main article: Electroreception The ampullae of Lorenzini are the electroreceptor organs. They number in the hundreds to thousands. Sharks use the ampullae of Lorenzini to detect the electromagnetic fields that all living things produce. The shark has the greatest electrical sensitivity of any animal. Sharks find prey hidden in sand by detecting the electric fields they produce. Ocean currents moving in the magnetic field of the Earth also generate electric fields that sharks can use for orientation and possibly navigation. Lateral line This system is found in most fish, including sharks. It detects motion or vibrations in water. Most live 20 to 30 years. The spiny dogfish has one of the longest lifespans at more than years. Fecundity in sharks ranges from 2 to over young per reproductive cycle. For example, lemon sharks reach sexual maturity at around age 13. Females in many of the larger species have bite marks that appear to be a result of a male grasping them to maintain position during mating. The bite marks may also come from courtship behavior: In some species, females have evolved thicker skin to withstand these bites. The extent of this behavior in the wild is unknown. Mammals are now the only major vertebrate group in which asexual reproduction has not been observed. Scientists say that asexual reproduction in the wild is rare, and probably a last-ditch effort to reproduce when a mate is not present. Asexual reproduction diminishes genetic diversity, which helps build defenses against threats to the species. Species that rely solely on it risk extinction. As in viviparity, the young are born alive and fully functional. Lamniforme sharks practice oophagy, where the first embryos to hatch eat the remaining eggs. Taking this a step further, sand tiger shark pups cannibalistically consume neighboring embryos. The survival strategy for ovoviviparous species is to brood the young to a comparatively large size before birth. The whale shark is now classified as ovoviviparous rather than oviparous, because extrauterine eggs are now thought to have been aborted. Most ovoviviparous sharks give

birth in sheltered areas, including bays, river mouths and shallow reefs. They choose such areas for protection from predators mainly other sharks and the abundance of food. Dogfish have the longest known gestation period of any shark, at 18 to 24 months. Basking sharks and frilled sharks appear to have even longer gestation periods, but accurate data are lacking. In most oviparous shark species, an egg case with the consistency of leather protects the developing embryo s. These cases may be corkscrewed into crevices for protection. Oviparous sharks include the horn shark , catshark , Port Jackson shark , and swellshark. However, this applies to only a few species. Most live far more social, sedentary, benthic lives, and appear likely to have their own distinct personalities. Sharks can be highly social, remaining in large schools.

### 2: Sharks, Fish Species - Your Fish Identification and Fishing Field Guide

*types of sharks and rays encountered in NSW waters. Once a shark or ray has been caught and requires identification, choose the most appropriate key from the list below - refer to.*

Sharks can shed many thousands of teeth throughout their lifetime. In order for these teeth to fossilize, they must sink to the seafloor and be quickly covered by sediment. Rapid burial is important for fossilization for a number of reasons. First, the sediment acts to protect the teeth from the weathering, abrasion, and scavenging that could occur if they were exposed to open water and currents. Secondly, burial also limits exposure to oxygen and bacteria which are responsible for decay. The process of fossilization is a slow one that usually takes thousands of years. This occurs as water seeps down through the sediments and over the teeth. This water carries different minerals in it that are deposited into open pore spaces in the teeth. The most common minerals are silica and calcite but other local minerals are deposited as well. Sharks, or chondrichthyans, are cartilaginous fishes. This means that most of their skeleton is composed of cartilage. The main exceptions are teeth and dermal ossicles, which are usually enameloid, and vertebral centra, which do calcify. Cartilage does not mineralize to the extent that bone does, and as a result breaks down much quicker and easier than bony elements. Teeth are the most common part of the shark that is fossilized, but it is not uncommon to also find individual vertebral centra in the same sediments. In very rare instances when an individual is buried very quickly under the right circumstances, portions of the cartilage can be preserved. This is seen in environments that are low energy with high sedimentation rates. These specimens can preserve the neurocranium, teeth, and articulated vertebral centra. Why are fossil shark teeth different colors? The color of fossil shark teeth is a result of the minerals that are present in the surrounding sediments. Teeth fossilize through a process called permineralization. As water seeps through sediments over the teeth, it transports the minerals that are found in the sediment. These minerals fill in pore spaces in the tooth causing them to fossilize. Different minerals turn different colors as they form and react with trace amounts of oxygen. For example, as iron oxidizes it begins to rust and typically turns a reddish brown. The same can happen to fossils. Where can you find fossil shark teeth? In general, fossils are found in sedimentary rocks or unconsolidated sediments. These are rocks that formed through the compression of loose sediments, like sands, muds, silts, and clays over thousands or millions of years. In Florida, many of these sediments have not been around long enough to compress into rock yet, and are still unconsolidated. Fossil shark teeth are found in sedimentary rocks that are specifically marine-derived, meaning that the sediments were originally laid down underwater in the ocean. This means that sediments originally deposited underwater 10, years ago, may be on dry land today. To find fossil shark teeth today, you must find exposed sediments or sedimentary rocks that are marine-derived. In Florida, that is relatively easy because the state is surrounded by water and has been periodically submerged during high stands of the oceans in the past. Not all marine sediments, however, yield great numbers of teeth. Areas that were shallow marine environments in the past tend to have more teeth, because more sharks were present there in the past. The sharks were probably drawn into these areas looking for food and cover. It can be hit or miss when looking for shark teeth, but looking in areas where teeth have been found in the past is a good start. How can you determine if a shark tooth is a fossil or recent? There are a number of different ways one can determine if a shark tooth is a fossil or if it is modern. Color can be an indicator of age in some situations but not all the time. Modern shark teeth, both the crown and the root, are typically white in color. Fossil teeth are permineralized and are usually darker colored. There are instances where fossil teeth exhibit a white crown however the root is usually a darker grey or beige color. When you find a shark tooth at the beach, you may need to look at its color to figure out its age. Identifying the tooth to species may also help. While many of the species found in the southeast today have been around for million years, some of the older teeth are extinct species no longer alive today. How can age of fossil shark teeth be determined? The best way to determine the age of fossil shark teeth is to determine the age of the sediments that the teeth were found in. This can be done using geological maps, which have been developed for most states and show where different aged sediments can be found. If a geologic map is not available, the age of sediments can be determined using the fossils

found in them. Sharks are not very good indicators of geologic age because shark evolution is a relatively slow process. Many of the species found in the oceans today have been around for million years. Other fossils including invertebrates, reptiles, mammals, and birds are much better indicators of age because they evolve much faster. If other types of fossils are found in associated sediments, they should also be kept and may be valuable for aging the locality. Identifying the shark teeth can be useful to get a rough estimate of age, but it will not be extremely precise. Geological maps are available for every state from the U. Is it difficult to identify the species of shark represented by a fossil shark tooth? It can be extremely difficult to identify shark teeth to the species level. There are a variety factors that make species identification very complicated. Since most teeth are found mixed and scattered, it has led to much confusion even between the experts. Many sharks exhibit dignathic heterodonty, which means that the upper and lower teeth are morphologically different. This is notably apparent in the snaggle-toothed shark, *Hemipristis*. Shark teeth also differ with regards to position within the jaw. The age of a shark can also play a factor in its tooth morphology. Many species change their diets throughout their lives, and their tooth shape and size can change to reflect their eating preferences. This can result in the gain or loss of serrations and cusplets, broadening or narrowing of the crown, and overall size of the tooth. Sexual dimorphism must also be taken into account when identifying shark teeth. Males and females of a given species may exhibit some differences in tooth shape and size, typically with females exhibiting slightly narrower or smaller teeth or differences in serration patterns. Finally, abnormal or pathologic teeth can distort a normal tooth into a shape that is almost unrecognizable. Twisted or bifurcated crowns, missing serrations or cusplets, and wrinkled or pinched edges can all make the identification process more complicated. Typically, it is fairly easy to identify a shark tooth to the genus level, but it can be extremely difficult to identify the species.

### 3: Shark Identification Network Â» Shark Identification

*The best way to identify shark teeth is to go to the beach and search along the tide line and the shoreline for small, black, triangular-shaped teeth that have a glossy quality and are about to 2 inches long.*

White Shark Hefty Sharks are the only really big fish that are available for the hooking by virtually any fisherman, anywhere in salt water, from boat or shore. In the past, Sharks were ignored or maligned by the majority of anglers, with only a few of the largest kinds being grudgingly granted the accolade of "gamefish. It goes without saying that Sharks of any species can be dangerous unless handled with the greatest care, and the larger the Shark, the greater the danger. There are three main groups of sharks we will deal with here in Florida. The first is the Hammerheads. They look like creatures from outer space with their eyes located at either end of broad, flat heads. Three of these are common throughout warm waters, but the Smooth Hammerhead likes cooler temperatures and is only a seasonal visitor to Florida. The second group, known as Requiem Sharks, includes most of the species regularly encountered by anglers in our coverage area. Some are popular sporting targets and easily recognized, but sorting out the identity of the others can be difficult for many fishermen. Our third group is made up of ocean-roaming Sharks that are often talked about, but not often seen by anglers, especially the Threshers, which comprise a separate family that is referred to as Mackerel Sharks, probably because of their fast-swimming capabilities. In our part of the world, the Shortfin Mako, although by no means common itself, is encountered far more often than any of the others in this bunch. Excerpts from the book Sport Fish of Florida a must for every tackle box and boat in and around Florida waters!!! Get your copy now!! Com is happy to partner with the leading fishing forum online, BigFishTackle. To find out answers to all your "fishing" questions please drop by the fishing forums at bigfishtackle. With over , members their fishing forum can answer just about any fishing question you may have. Friendly, helpful and informative anglers really make you feel like part of their online fishing community! All Florida, the Bahamas and the Caribbean. But often too often? Frequently identifiable by size alone. Small ones can be distinguished from the Scalloped Hammerhead by the rather flat frontal edge of the head, and by the rear edge of the pelvic fin, which is curved only in the Great Hammerhead. Commonly runs more than pounds and sometimes as much as 1, pounds; possibly can reach one ton. Florida and world records pounds. Monstrous size alone makes it an equally monstrous angling challenge. Only the heaviest sporting gear stands much of a chance- pound line or, at the least, pound. Will take a large fresh-dead baitfish, but is more easily hooked on oversize live bait. Drifting; Still Fishing; Trolling.

### 4: From a thresher to a porbeagle: How to identify the sharks found in our seas - Devon Live

*Angel Shark (Squatina squatina): Found in the coastal waters of Europe and the Mediterranean Sea, Angel Sharks are mottled with gray and brown spots. They have conical barbels, a broad stout body, a thornless back, and grow up to feet long.*

The tiger shark prefers temperate and tropical seas, while the lemon shark occupies waterways along the coasts of North and South America and throughout the Caribbean Sea. The bull shark is somewhat ubiquitous, existing along the shorelines of all continents but Europe and Antarctica, and even in many rivers. Lemon Shark The lemon shark is so called thanks to its dull yellow color. An adult lemon shark can grow to 11 feet in length and weigh over pounds. There is a yellow-brown tinge found along the dorsal fin on the back of the animal and a yellow tint along the abdominal area. There are two dorsal fins -- the first is broad and low and set behind the pectoral fins, and the second is nearly the same size and shape and is set at the rear of the animal. Bull Shark Bull sharks are commonly found in the shallows along the shoreline and even in inland rivers. They can grow to Since this behavior is not common amongst other species, sharks spotted in rivers or other freshwater bodies are often initially identified as bull sharks. They are grey in color on all visible areas, with a solid white underside. Bull sharks have short snouts, which they use to ram prey before proceeding to devour it. Their name was earned both by their facial appearance and their relentless and aggressive demeanor. Bull sharks have smaller eyes than many other species of shark, and you will find a large triangle-shaped first dorsal fin with a small triangular second dorsal fin behind. The pectoral fins are unusually large and triangular as well. Tiger Shark Young tiger sharks are often immediately recognizable thanks to the black stripes that run up and down along their sides. These tiger stripes get lighter and lighter as the shark matures until they disappear completely in adulthood. The tiger shark has large eyes and a short snout, with a large mouth accented by slots that run from its corners toward the rear of the fish. On its back the tiger shark has a large triangular dorsal fin with rounded corners and a small second dorsal fin that is far less pronounced. At a maximum size of 14 feet and 1, pounds, the tiger shark is considered a large shark. Interesting Facts In all there have been 22 reported lemon shark attacks against humans. There have been zero fatalities -- they prefer small fish and shellfish to any larger prey that may put up a fight. Bull sharks will attack larger mammals in certain circumstances and are aggressive more often than not. Tiger sharks are responsible for more attacks on humans than any other shark except the great white. Although they are responsible for fewer attacks, they are more likely to stay and continue to attack after biting a human. Tiger and lemon sharks are considered near-threatened species; although heavily fished, bull sharks are not threatened.

### 5: How to Identify a Sand Tiger Shark: 6 Steps (with Pictures)

*In the next few weeks, I'm going to write a series about some of the sharks we see at Guadalupe Island, but before I get started on that, I have to tell you how we actually identify the individual great white sharks and how that all got started.*

Do Shark Diving Operators need to be regulated? How do we identify the sharks at Guadalupe? When I first saw one of these amazing creatures, I thought it was the most incredible experience of my life. I was thinking "Wow check out that shark! Just when I had that thought, an incredible thing happened. Now that got my attention. While I had no idea at the time, that was the moment my "relationship" with the shark that became known as "Shredder" began. A lot of operators just made up a name for a shark, based on a bite mark, a behavior, a mutilation, or they simply pulled one out of thin air. Those names were different from boat to boat and changed from trip to trip. We had no idea, how many different individuals we saw or to reliably know what sharks we saw. In general, we knew very little about the sharks. We found out pretty quickly, that bite marks are not a very good way to identify the sharks, since they have this amazing ability to heal and even some nasty wounds, barely leave a mark. So how did we find a reliable way to identify the sharks? Chugey with a nasty bite! In , Nicole started collecting pictures that were donated by the divers of all the shark diving vessels at Isla Guadalupe and put together a database of every shark that was photographed there. Nicole was using the unique color patterns of the sharks to individually identify them, a method still used today, with the database now including individual sharks. The areas we look at to identify the sharks are the gills, the pelvic fin area and the tail, any mutilations and obviously, the gender of the animal. The photo ID is not just awesome to identify the sharks we are seeing, it goes far beyond that. This is important data in white shark management and conservation. With your purchase, you not only get an awesome book, but you also help support the ongoing research. If you would like to come out on a shark trip and hear about this research, Shark Diver has 3 special science trips this season. Nicole is joining us on these trips and will tell you all about the ongoing research and teach you how to identify the sharks. What an opportunity to meet the person responsible for this. The dates for our special science trips this season are: If you like to join us, please call

### 6: Scientists Identify Shark Species Using DNA From Tooth Found in Boy's Leg

*Identifying Shark Fins: Implementing and Enforcing CITES is a field identification guide that was created to help enforcement personnel to provisionally identify the dried and wet fins of commercially traded CITES listed shark species based on morphological characteristics of their most dis.*

Click to view larger image Family: Alopiidae Thresher sharks Genus and Species: The body of the common thresher shark is moderately elongate. The snout is rather short, and the mouth crescent shaped. The first dorsal fin is large, and located midway between the pectoral and ventral fins. The second dorsal and anal fins are very small. The tail is distinctive since it is very long, almost as long as the rest of the body. The coloration may vary from brownish gray, bluish or blackish above to silvery, bluish or golden below. The dorsal, pectoral and ventral fins are blackish and sometimes the pectoral and ventral fins have a white dot in the lip. The bigeye thresher also occurs off the California coast. It can be distinguished by its large eye; however, if you can count the teeth in the upper jaw, the common thresher has 21 - 22 on each side while the bigeye thresher has 10 - 11 on each side. The common thresher shark occurs worldwide in warmer seas. The common thresher is an inhabitant of the upper layers of deep offshore waters and is most abundant in areas of steep bottom contour along the edges of the continental shelf. During the spring and summer months smaller threshers may occur near shore where they are often seen leaping completely out of the water. The food habits of the thresher are not well known, but on the California coast they feed mostly upon small fish such as sardines, anchovies, mackerel, and squid. They are said to use their long tail as a flail to frighten or stun their prey. The common thresher shark bears live young and appears to become sexually mature in 6 or 7 years. Four pups are produced annually. A 18 foot female contained four young that weighed Most thresher sharks caught off California have been taken on live sardines, anchovies, or mackerel. They are most abundant during the summer months. Considered a fine game species on light or medium tackle, they often put on an aerial demonstration. At other times the battle is entirely beneath the surface and consists of brute strength and shift-towing tactics. Largest taken off California by a recreational angler: Lamnidae Mackerel shark Genus and Species: The body of the shortfin mako shark is elongate but rather stout. The snout is long and pointed. The first dorsal and the pectoral fins are large, but the second dorsal and anal fins are very small. This species is a deep blue or dark gray above and white below. There is a black spot at the base of the pectorals. This shark is found worldwide in warm and temperate seas; in the eastern Pacific from Chile to the Columbia River, Washington, including the Gulf of California, but not in the tropics. The diet of the shortfin mako shark includes fishes and squid, often large ones. Whenever possible, the bonito shark takes its food in one gulp. With its tremendous speed, it is unquestionably a dangerous shark. Shortfin mako sharks bear live young. The shortfin mako bonito shark is one of the larger sharks to inhabit California waters. By all accounts, it is as dangerous as any shark, and it probably swims faster than most. The best way to hook a shortfin mako shark is by trolling with a whole tuna, squid or mackerel using a steel leader. You can also use lures, and chumming does help. Watch out, when you catch one, because this is a dangerous fish that will not hesitate to attack you or your boat.

### 7: Fossil Shark Teeth – Discover Fishes

*Using Dichotomous Key to Identify Sharks. Classification is a way of separating a large group of closely related organisms into smaller subgroups. The scientific names of organisms are based on the classification systems of living organisms.*

**Contact Shark Identification** While as many as twenty species of shark are known to inhabit the western North Atlantic waters, little is known about their distribution, movements or occurrence. Even less is known about the threats they face. This technique is called photo-identification and has been used to distinguish individuals of other species, such as humpback whales, right whales and sperm whales. How does photo-ID work? With enough photos of individual sharks, it is possible to estimate population size within the area in which they are found. Furthermore, we can determine whether the same sharks return to the same region year after year and how individuals use these waters within the same season.

**Commonly Encountered Shark Species** Of the many species that occur in our these waters, six are commonly sighted or encountered. Profiles of these species can be found below.

**Basking Shark** Maximum Size: Grayish-brown often with mottled appearance Key Features: They get their nutrition by filtering tiny zooplankton, small invertebrates and small fish as they move along the water with an open mouth.

**Porbeagle Shark** Maximum Size: Heavy grey-blue Key Features: Blue Shark Maximum Size: Deep Indigo blue Key Features: White Shark Maximum Size: Lead grey, brownish grey or black Key Features: Metallic indigo blue

- 1 Distinct primary keel secondary keel is absent
- 2 Moderately short pectoral fins
- 3 Second dorsal is much smaller than the first dorsal; First dorsal is rounded in juveniles

May be confused with a Porbeagle Shark.

**Common Thresher Shark** Maximum Size: Brown, gray, blue-gray or black Key Features: Problematic ID While some shark species may be confused with one another e. Mola Mola are often seen near the surface, swimming either upright, dorsal fin flailing from side to side, or flipped over swimming on its side.

What is the Shark Identification Network?

## 8: How to Identify Lemon, Bull & Tiger Sharks | Animals - [www.enganchecubano.com](http://www.enganchecubano.com)

*Identification Guide to SHARKS of Mississippi By Dr. Eric Hoffmayer, Jim Franks and John Shelley The University of Southern Mississippi Gulf Coast Research Laboratory.*

I had to hold my breath to take this close-up shot, as these hammerheads tend to shy away from the bubbles coming from scubadivers. Instead, they have Cartilage. Cartilage is firm but more flexible than bone. It is found in your nose and ears. Fish that are made of Cartilage are called "chondrichthyes. Many Types of Sharks: Sharks and Rays belong to the Elasmobranchii subclass. This subclass contains 8 extant living orders, which contains over species. Over of those species are sharks! Of the species of sharks, how many can you name? Sharks first appear around million years ago in the Ordovician time period. Some of the very first shark fossils come from the Harding sandstone in Colorado. The first sharks may not have had teeth or even jaws! Here is an article about Shark Evolution. The largest shark is the Whale Shark. Whale sharks can reach lengths over 40 feet! The Largest Prehistoric Shark: The largest prehistoric shark is called the Megalodon. Here is an article all about the Megalodon Shark Teeth: Sharks are unique in that they have rows of replacement teeth growing behind each tooth. When one falls out, another one simply replaces it. A shark can go through 10, to 20, teeth in its lifetime! Sharks have adapted to a wide range of conditions. Some live in tropical waters, others live in arctic waters. Some live near-shore, while others live in the open ocean. Some prefer very deep water, others prefer shallow water. Some sharks, like the Bull shark and the River shark can even tolerate freshwater! Sharks also come in a wide variety of shapes and sizes. Most sharks are under 3 feet in length. However, some sharks are quite large. The Basking shark can reach lengths of over 30 feet, while the Whale shark can reach lengths of over 40 feet! The Great White shark can smell a single drop of blood in an olympic sized pool! Although the total numbers of sharks are unclear, many sharks are threatened by overfishing and shark finning. Although the media wants you think otherwise, shark attacks are rare! Humans are not a food source for sharks, even the Great White. On average there are less than shark attacks per year. Of those, less than 10 are fatal. When at the beach, your chances of being attacked by a shark are a mere 1 in To give you a perspective, here are some other averages: In the United States: There is less than 1 fatal shark attack each year Vending machines kill 2 people per year Snakes kill 5 people per year Icicles kill 15 people per year Horses kill 20 people per year Cows kill 20 people per year Lightning kills 49 people per year Deer kill people per year people accidentally drown each year Texting while driving kills 3, people per year Global Averages Sharks kill 10 people per year Jellyfish kill 30 people per year Champagne corks kill 24 people per year Coconuts kill people per year Elephants kill people per year Hippos kill 3, people per year Snakes kill around 40, people per year! Shark Anatomy - What do Sharks look like? Sharks are a type of fish in the Chondrichthyes class, or the cartilaginous fish. This means sharks do not have a hard skeleton like us, instead their skeleton is made of a dense cartilage; similar to what the tip of your nose and ears are made of. The chondrichthyes class not only includes sharks, but also skates, rays, and chimaeras as they also have a cartilaginous skeleton. Specifically, sharks, skates, and rays belong to the Elasmobranchii subclass. This subclass contains 8 extant orders, which in itself contains over species. The following shark pictures show the physical characteristics of a shark. This shark picture shows the main body features of a shark. This picture was taken at Wolf Island in the Galapagos during one of my dive trips. This shark picture shows detailed structures on the head of a shark, plus claspers, which are not present in the first picture. This picture was taken at the North Shore in Hawaii during a shark cage excursion. Each shark order has a slightly different anatomy. Some orders have fin spines, some have one dorsal fin while other orders have two. The number of gill slits ranges from 5 to 7 depending on the order, some are torpedo shaped, some a very flat. There are a wide range of shapes and sizes of sharks. Most of the terminology in the diagrams are self explanatory. Some shark terms that may be unfamiliar include the spiracles and the claspers. Claspers are found on male sharks. The spiracles are a bit more complicated. A spiracle is a hole behind the eye that leads to the mouth. When tracing the evolution, it use to be a gill in jawless fish. When jaws developed, the jaw bones isolated this gill slit from the rest, and could no longer be used. A remnant hole from this unused gill still remains in sharks.

What is Shark Skin made of? Dermal Denticles shark skin, showing the side view of shark dermal denticles  
Shark dermal denticles - Top view If you have ever touched shark skin, you have noticed it is quite different from other fish. When rubbing in one direction, it feels silky smooth. However, when rubbing in the opposite direction, it feels like coarse sandpaper! Some ancient cultures actually used shark skin as sand paper. This sand paper like texture results from the sharks highly modified scales, called denticles. These denticles are very different from regular fish scales. They are very streamlined hydrodynamic , and point away from the front of the shark. This lets water easily pass over the shark, allowing it to swim more efficiently. Shark dermal denticles are very small, less than a millimeter in size. The images shows zoomed in sections on the tail of a shark, once zoomed in enough, you can start to see the denticles. They look like tiny diamonds, with small ridges on them. Ancient Predators in a Modern Sea By: Salvador Jorgensen, Jorgenson, a top shark researcher, has done an outstanding job on this book. It is filled with incredible photos, diagrams, and latest discoveries. The writing is clear and concise. He also explains many of they scientific concepts in an easy to follow and lively writing. The book is incredibly indepth. I recommend this book for someone with a casual interest, to the serious adult. This book is it. Just check out the sample images and user reviews! Peschak, Sharks and People is written by Peschak, an acclaimed wildlife photographer, who has spent many years photographing sharks. As a result, this book is a work of art. It contains many stunning images of sharks. The book does a wonderful job at examining the conservation issues and the complex relationship between sharks and people from a number of perspectives. It will change how you think about sharks. He is the one that cataloged the sharks for the FAO species catalogue. He is very thourough and not overly technical, which is a rarity! This book has full over accurate and full color illustrations of all the known shark species plus a bunch on undescribed ones. The illustrations are done by Mark Dando, which is probably the best shark artist out there. There is now an update to this book: Sharks of the World: A Fully Illustrated Guide , They are one of the original fossil dealers on the internet and concentrate on quality. It not only has shark teeth, a shark model, but also a shark jaw.

### 9: Guide to Shark Identification - Carcharhiniformes

*The lemon shark is so called thanks to its dull yellow color. An adult lemon shark can grow to 11 feet in length and weigh over pounds. The lemon shark is considered to be a larger species, but it's far less aggressive than many smaller sharks can be.*

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