

# SHARK – external anatomy

There are approximately 500 shark species worldwide and more than 100 of these are found in Western Australian waters. They are distinctive in that they have a skeleton made out of cartilage – a material that is softer than true bone. This lightweight skeleton provides a flexible framework for muscles to move.



## Nostril

The mouths and nostrils of sharks are on the underside of the head (ventral), rather than on the dorsal surface as in most bony fishes.

Sharks take in water through the mouth or spiracle – an opening just behind the eyes (of some sharks). They are modified gill slits that allow fish to take in oxygenated water. Spiracles help a shark to breathe when it is lying on the sea bottom or even buried right under the sand.

## Gills

In front of the sharks pectoral fins are 5-7 gill slits which serve as valves to let water out. Oxygen and carbon dioxide are exchanged across the gill surface.

## Dorsal fin

Similarly to bony fishes, dorsal fins in sharks act like a yacht keel to keep them stable.

## Second dorsal fin



### Did you know ...

Over half of Australia's shark species do not grow to more than one metre in length.



### Did you know ...

The largest fish in the sea, the whale shark, is a cartilaginous fish and may reach up to 12 metres in length!



## Eyes

Some sharks eyes are protected by eyelids, a third protective eyelid called the nictitating membrane, with some also able to roll the eye back into the socket.

## Mouth

Cartilaginous fish have jaws but their teeth are embedded in their gums (rather than attached to their jaws). The teeth are constantly replaced and most sharks have several rows of developing teeth behind their main row, waiting to be used whenever a tooth is broken or dislodged.

## Pectoral fin

Pectoral fins can be used individually to manoeuvre the fish up, down and sideways. Together, these fins act as brakes and the fish can also use them to swim backwards.

## Pelvic fins

The pelvic fins are used for braking and steering.

## Anal fin

Like the dorsal fins, the anal fins play an important role by acting as stabilisers – without them the fish would roll over on its side.

## Caudal fin

Most sharks have a heterocercal tail – that is, the top lobe is larger than the bottom lobe. This forces the nose of the shark up as it swims (which is balanced by down force provided by the pectoral fins).



## Ampullae of Lorenzini

A network of jelly-filled pores used for detecting the bioelectric fields produced by prey, potential predators and conspecific during social interactions



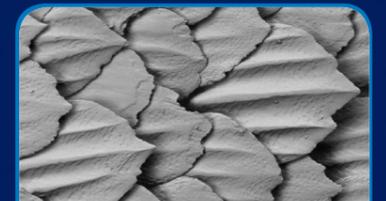
A shark's body form may also depict where it lives. Gigantic filter feeding sharks, e.g. basking shark, found largely in the pelagic zone resemble whales, whilst reef sharks are well adapted for their environment with their wedge-shaped heads for getting into cracks and crevices. Carpet-like wobbegongs camouflage amongst their coral or algae habitats.

## Claspers

Male sharks have claspers that are used to attach to females during mating and insert sperm into the female's body. Cartilaginous fish all reproduce by internal fertilisation and either give birth to live young (as is the case with white, mako or tiger sharks), or lay a few large eggs (as in the bottom dwelling Port Jackson sharks).



Many sharks use camouflage in the form of countershading. Their bodies are blue or dark grey on the top and silvery or white underneath, making them less visible to predators and prey above or below them.



Sharks have small tooth-like scales, called denticles, embedded in their skin. The image above is an extreme close-up of great white shark skin.

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