

The Evolution of sharks

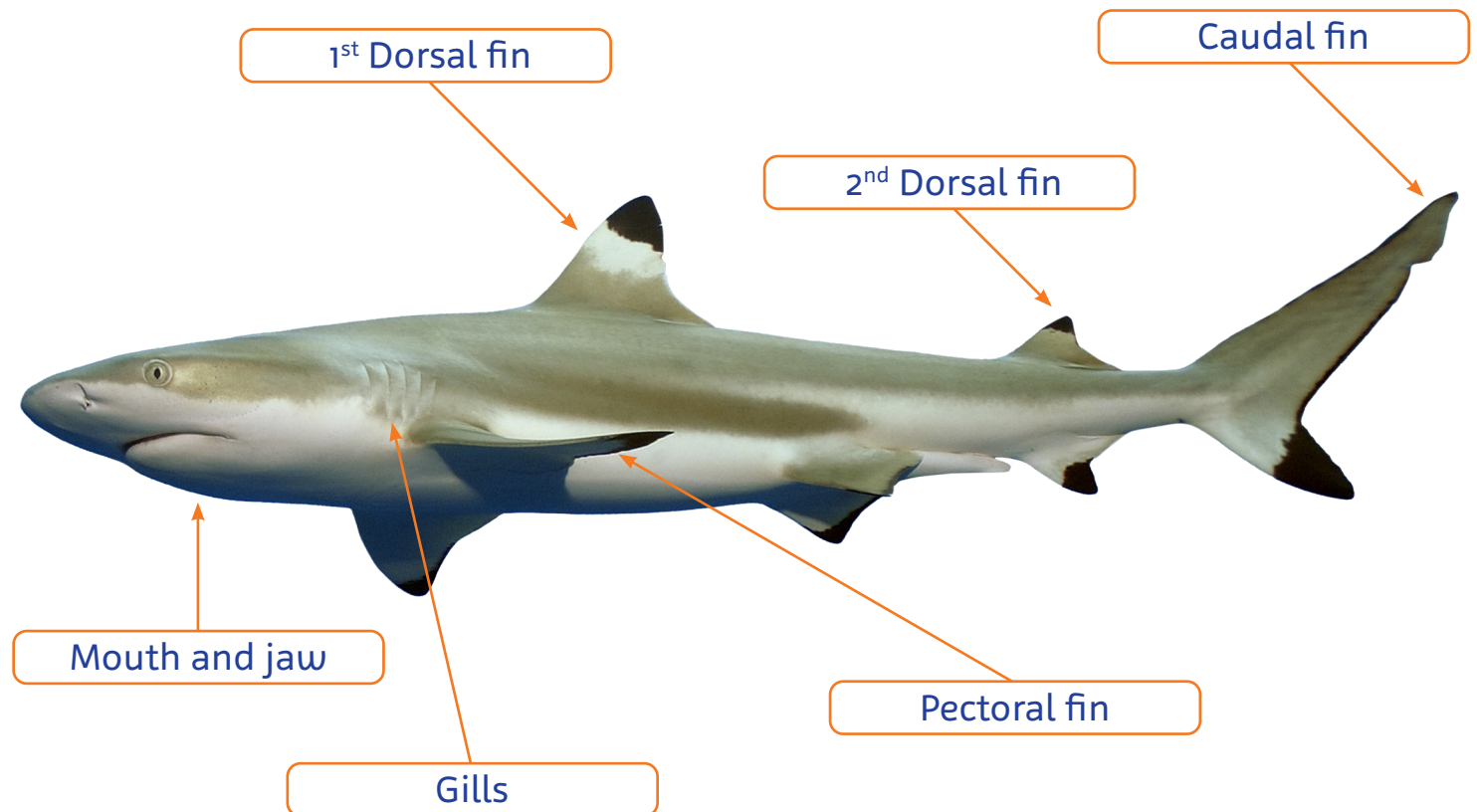
We care for several species of shark across our SEA LIFE aquariums – but did you know that sharks are well known for having survived many external stressors through an evolutionary process called ‘natural selection’?

All species **evolve** over time (over hundreds of thousands of years!), very small changes take place due to them needing to adapt to their changing environment, predators, prey and/or disease. Sharks have been evolving for 450 million years. During this time, there have been many adaptations, and hundreds of different species of sharks have evolved.

The species that we know today (from the sand tiger shark to the nurse shark; the black tip reef shark to the hammerhead; and not forgetting the great white shark!) have evolved with slightly different characteristics. Characteristics which help them survive are known as ‘**adaptations**’.

Being able to adapt helps the species avoid becoming extinct. This process is known as **natural selection**. Individual organisms with the most useful characteristics are more likely to survive and reproduce, resulting in these characteristics being passed on to **offspring (inherited)**.

Anatomy of a Blacktip Reef Shark



Task 1

In the table below, identify why these adaptations would be an effective characteristic to be inherited by offspring. These adaptations are shared by many, but not all, species of shark.

Characteristic	Why might this adaptation have been inherited by sharks through natural selection?
Dorsal fins	
Caudal fin (which sits at the end of the shark's body)	
A flexible, protruding jaw	
The shape of the body (tapered at both ends)	
The ability to regrow teeth (infinitely)	
A highly specialised sense of smell, with the ability to smell blood from injured prey over a long distance	

Changes in DNA over time are always occurring in all species. These can be as a result of inheritance, passing favourable traits to offspring or due to environmental changes which mean they adapt in order to have a better chance of surviving and passing on their genes. This is known as **genetic mutations**.

Task 2

In the table below, consider the reasons for why the following adaptations would be beneficial characteristics to inherit as part of natural selection. Use the important information about these species to help you.

Species of shark	Specific characteristic	Important information about this species of shark to consider	Why might this adaptation be a characteristic inherited through natural selection?
Blacktip reef shark	They give birth to live young, rather than laying eggs.	These sharks often fall prey to larger fish such as groupers, grey reef sharks, tiger sharks or even bigger blacktip reef sharks.	
	They have a unique adaptation called “countershading”, where their dorsal side is darker for camouflaging.		
Nurse shark	Whilst most sharks need to keep moving so that water flows over their gills, nurse sharks can stop swimming, as they can pump water through their mouths and gills while they’re still.	Nurse sharks hunt a lot of their prey from the sandy bottom of the sea.	
Great white shark	Specific teeth structures mean their edges have saw-like features.	The great white shark is the world’s largest known predatory fish.	