

The battle between top predators by Jamila Janna

Card #	Card text	Visual Notes
1	<p>The battle between top predators</p> <p>In this card deck, learn about top predators, why orca's predate on sharks and why top predators are important in an ecosystem.</p>	<p>An illustration of False Bay from the sea. It is early morning; the horizon is a pink-orange hue and in the background, there are mountains that are covered by a misty blanket.</p> <p>In the foreground there are two orcas with floppy fins jumping out of the water.</p>
2	<p>Somewhere in the waters of False Bay, South Africa, there is excitement and chaos ensuing in the ocean. Marine animals of all kinds wait patiently for the battle they never thought they would live to see.</p>	<p>A poster of a boxing match between an orca and shark is hung on a kelp stalk. Both the shark and orca are wearing boxing gloves. The orca has a collapsed dorsal fin.</p>
3	<p>"Yoh, I never thought this day would come! Great White has never been challenged before. He made the rules in these waters. He is the Top Predator!"</p>	<p>In the foreground, a teenage pyjama shark has an excited look on his face. His eyes are wide, and he has a big smile on his face. A green turtle with grey eyebrows and a grey beard looks at him with a friendly smile.</p> <p>In the background, the water is a turquoise-green hue with light breaking through it.</p>
4	<p>A top predator is an animal that is at the top of the food chain and does not have any natural predator of its own.</p> <p>They are important because they help keep an ecosystem healthy and balanced.</p>	<p>An illustration of a frame with an orca wearing a gold crown. The orca has a huge smile, exposing all its teeth. Written at the bottom of the frame are the words "Undisputed Champion of the Ocean."</p>

5	“Actually, he has been challenged for a while now.”	In the foreground, the green turtle looks at the pyjama shark. He has a small frown on his face. The kelp and ocean are faded in the background.
6	A single sweat escapes his pores and trails a path down his brow. Goosebumps cover his arms as he recalls the several close encounters Great White has had with fishing vessels and large nets.	In the foreground is the green turtle’s frightened face. There is a sweat sitting on his brow.
7	“He has been challenged by those who walk with two feet but travel the seas in big ships with big nets. Great White has never been challenged by our very own.”	An illustration from the perspective of a person looking up at a net in the ocean. There are fish, sharks and seals caught in the net.
8	“Eish that’s true. Humankind is hunting down our neighbours and destroying our communities. Fifty years ago, our oceans were filled with beautiful colours and so much life. They are the top predator!”	An illustration of a kelp forest full of pyjama sharks, fish, sea urchins, sea stars and seals diving into the water. The illustration is vibrant, with sunrays breaking though in the water.
9	“But Humankind is not considered a top predator. His actions do not restore balance in ecosystems; they do not keep ecosystems healthy. The Orcas are now the top predators.”	Newspaper article with the headline “Recent oil spill wipes out 20% of penguin colony”. The picture in the newspaper is a large ship and an oil spill.
10	“So why is the Orca gang challenging Great White?”	Orca confronting a great white shark. He stands tall over the white shark, like a bully
11	“Let me tell you a story while we wait for this line to move.”	An illustration of a long line of marine animals waiting at a ticket counter outside of a sandy stadium. Kelp act as trees and the water is a turquoise green.
12	<i>Many years ago, in seas far far away, the carcasses of white sharks were washing up on beaches. They had big bites taken off on their sides with vital organs missing.</i>	A black and white illustration of a white shark on a beach. There are clouds in the sky

	<i>No one really understood why this was happening.</i>	and a few seabirds walking on the beach.
13	<i>Concerned scientists investigated this strange occurrence. They were worried that the oceans would become imbalanced and that they would not benefit from it any longer.</i>	A black and white illustration of scientists in a boardroom talking about the shark.
14	<i>After years of investigating this strange occurrence, they noticed that when three male orcas were spotted in the waters, a few weeks later a shark would wash up on the beaches: bitten and missing organs.</i>	A report with graphs and charts. Three distinct points on a graph have an asterisk and the word “orca sighting” next to them.
15	<i>They decided to investigate if it was possible for orca’s to do this?</i>	A black and white illustration with a scientist reading books with a lamp light. The rest of the background is a dark grey.
16	“Wait, are you telling me that Great White’s ancestors have been challenged before by Orca’s?”	The young pyjama shark and older green turtle are standing next to each other. The pyjama shark looks intrigued.
17	“Yes, but previously it was not so close to the shore. Anyway...”	A dream bubble above the older green turtle illustrates a stranded shark on a beach. There are people looking at it in shock. The illustration in the thought bubble is in black and white.
18	<i>The scientists finally found evidence. There were other scientists, Ford and his colleagues, were also curious about orca’s predating on shark. In their study they compared the teeth of orca’s that ate salmon, orcas that ate sea lions and other pinniped, and orcas that ate sharks.</i>	A black and white illustration of three sets of orca teeth. One set is sharp, another set is partially sharp, and the other set is flattened.
19	<i>The orca’s that ate sharks has flat teeth compared to the other orcas.</i>	A black and white illustration with an orca with flat teeth sitting in an orca dentist’s chair.
20	“Woah! Is it because sharks have skin that is made from	A coloured illustration of the young pyjama shark saying

	<p>tiny teeth-like structures?”</p> <p>“Yes, that’s right!”</p>	<p>woah! There is intrigue on his face.</p>
21	<p>Shark skin is made from something called dermal denticles. This helps the swim faster in the water and save energy when hunting.</p>	<p>A zoomed in illustration of shark skin. There are many teeth all faced in one direction, one above another in neat rows.</p>
22	<p>“So why were the orca’s eating shark organs? Is that even normal?”</p>	<p>A curious young pyjama shark scratched his head.</p>
23	<p><i>It is said that the orcas were trying to get to the shark’s livers, which are filled with all the energy and nutrients orcas need. Instead of eating the whole shark and messing with their teeth, they take only what they need.</i></p>	<p>A black and white illustration of an orca drinking an unlabelled energy drink.</p>
24	<p><i>Legend has it that great white sharks were not the only victims. Orca terrorized the Seven-gill sharks until they ran away from home.</i></p>	<p>A black and white illustration of many seven-gill sharks leaving the kelp forest with suitcases, as if leaving their town.</p>
25	<p>“Did they also remove the liver from the Seven-gills?”</p>	<p>A coloured illustration of the young pyjama shark holding his fin against his mouth in shock.</p>
27	<p>“Unfortunately, they did. It’s a tragic history.”</p>	<p>A coloured illustration of the older green turtle looking down with a sad face.</p>
28	<p>“So, if the Orca gang are challenging Great White, like those before them, does that mean that Great White is in danger?”</p>	<p>An illustration of a white shark swimming in the ocean.</p>
29	<p>“There are a lot of uncertainties right now. Normally this is something we would not worry about too much. But the Great White and his shark cousins are experiencing all types of pressure.”</p>	<p>A skinny mother shark gives a forehead kiss to her baby shark.</p>
30	<p>“Do you mean like with humankind and their boats and nets?”</p>	<p>An ocean littered with many boats and nets.</p>

31	<p>“Yes, but our home is also changing. Because the planet is getting warmer, more and more life is disappearing. Sharks are feeling the pressure too.”</p>	<p>An illustration of a bleached coral reef (corals are white). There are no fish and the backgrounded a greyish light blue.</p>
32	<p>“I don’t think I am excited to watch this match anymore. Not after everything you have told me.”</p>	<p>The young pyjama shark has his hands over his head, with shock on his face.</p>
33	<p>“Life is unpredictable, but there are some amongst humankind that are rooting for a balanced ocean. They are doing the work and maybe one day things will be back to normal.”</p>	<p>A black female scientist is on TV doing an interview. In the background is a screen with her on a boat and shark in front of it. The words “Scientist advocates for sharks” are written as the headline.</p>
34	<p>Course Summary</p> <p>Top predators are important in an ecosystem because they maintain ecosystem balance.</p> <p>Great white sharks are hunted by orcas in the wild. This then makes orcas top predators. Orcas hunt sharks for their livers, which have important nutrients for orcas.</p> <p>White sharks also experience other pressures that influence their survival. However, there are scientists working towards conserving sharks.</p>	
35	<p>Activity</p> <ol style="list-style-type: none"> 1. Name a top predator and the ecosystem it inhabits. 2. How does the top predator balance its ecosystem? 3. Does it experience any threats, environmental or anthropogenic (originating from human activities)? 	

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Biography

Jamila Janna

Jamila Janna is marine biologist and science communicator. She writes blogs, is a filmmaker and a social media strategist.

