

Sharks and rays: lesson 2 of 3

Sharks on the reef

Who eats whom, and why reefs need sharks



Bamboo shark resting on a reef near MCP. Photo: MCP volunteers



Residents and visitors

Some sharks live on one reef for years, like the two bamboo sharks MCP volunteers keep seeing at the Latason and Lutoban marine protected areas. Others are visitors that travel huge distances, like whale sharks.



Resident: bamboo shark



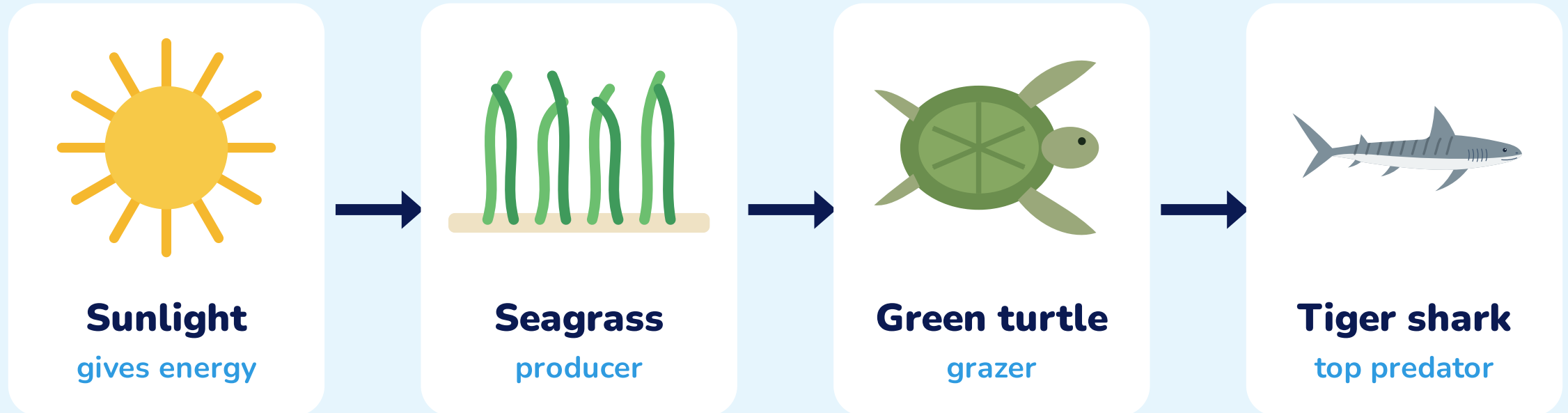
Visitor: whale shark

What could a resident shark tell us about its reef? What could a visitor tell us about the ocean?

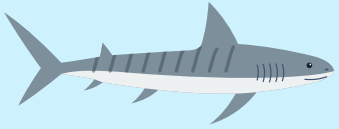


Who eats whom?

A food chain shows how energy moves from one living thing to the next. The arrows point from the food to the animal that eats it.



Sharks and rays have different jobs



Top predator
Tiger shark

eats sea turtles, big fish, even other sharks



Reef hunter
Blacktip reef shark

chases small fish over the reef



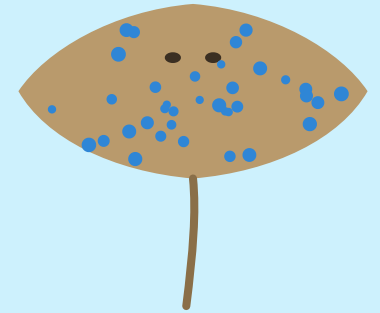
Night hunter
Bamboo shark

hunts crabs, shrimp and small fish after dark



Filter feeders
Whale sharks and mantas

sieve plankton out of the water



Sand digger
Stingray

digs crabs, worms and clams out of the sand



The web of life game

1. Wear your species card and stand in a big circle.
2. Sunlight holds the end of the string and passes the ball to something that uses its energy.
3. Keep hold of your bit, then pass the ball to something that eats you, or that you eat.
4. Keep going until everyone holds at least one string.
5. Then listen for what happens next.

What happens if...

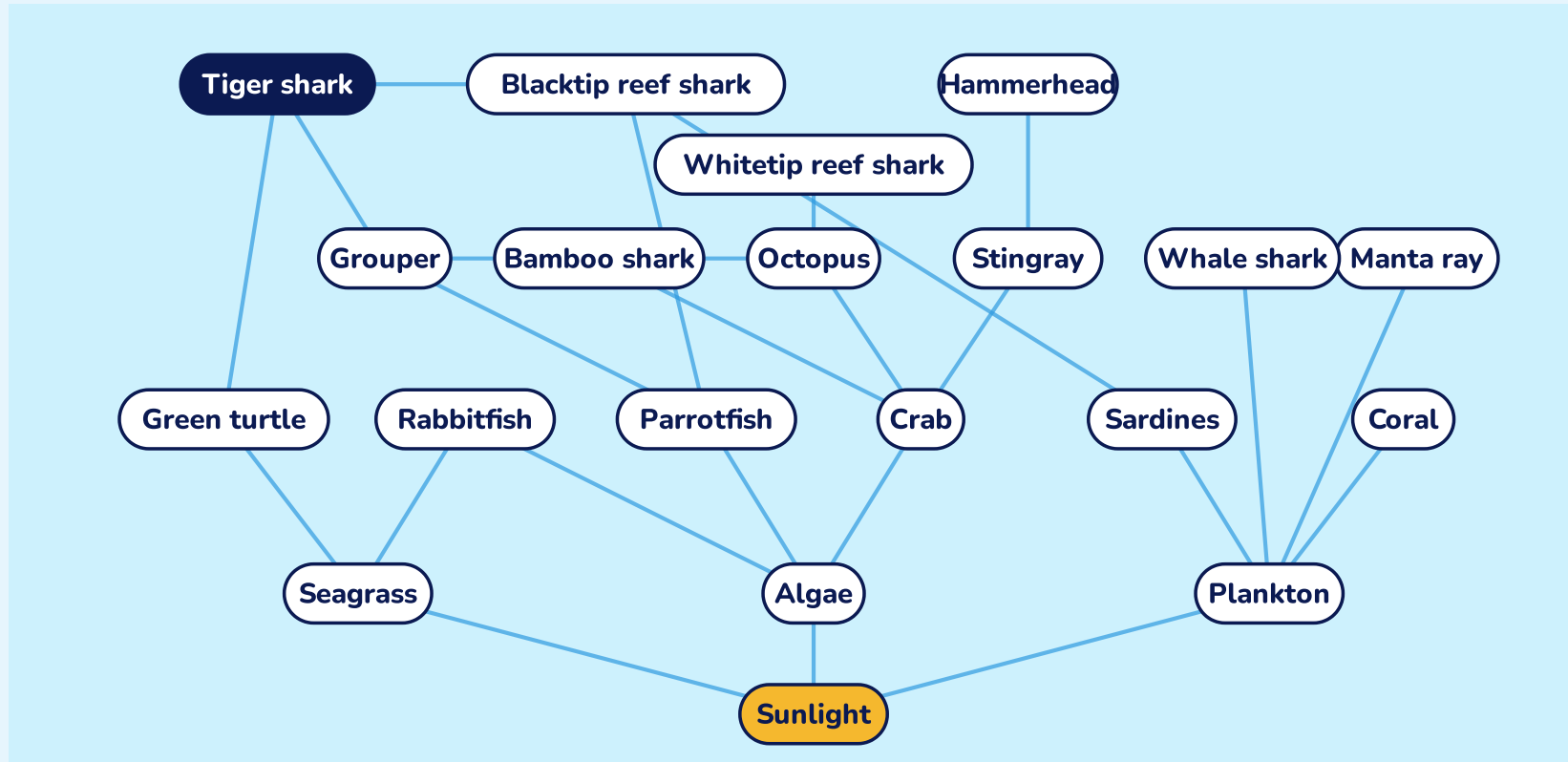
...a fishing boat catches the tiger shark? Tiger shark, give your strings a gentle tug.

...a heatwave kills the seagrass? Seagrass, let go.

Who felt it?



What did the web show?



Who felt the tug when the tiger shark was taken?

Which species held the most strings?

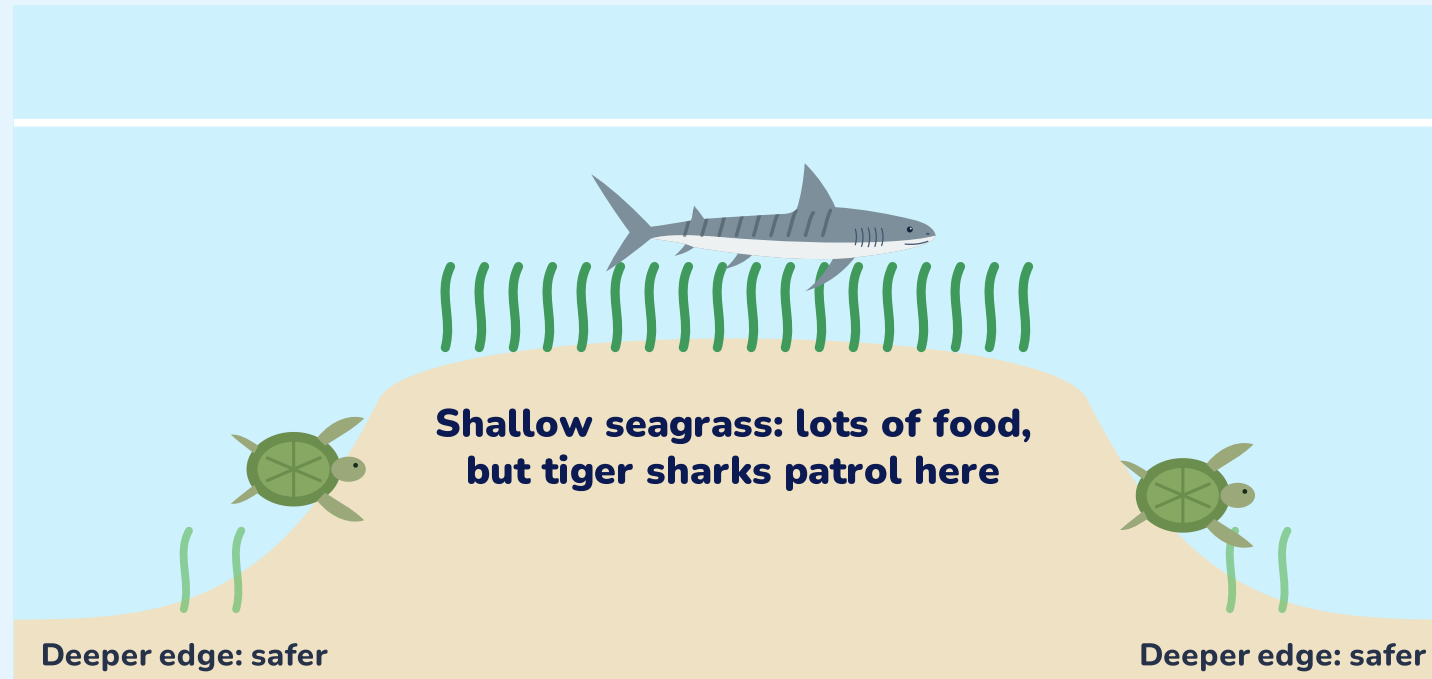
What happened when the seagrass died?

How many strings led to people?



The Shark Bay story

In Shark Bay, Australia, scientists have studied tiger sharks since 1997. The sharks patrol the shallow seagrass, so turtles and dugongs spend more time at the safer, deeper edges. Scientists think this helps keep the seagrass in the middle healthy.



How we know: Heithaus and others, Shark Bay Ecosystem Research Project, Florida International University



When the sharks are gone

In Bermuda, in the Atlantic Ocean, tiger sharks have become rare. Scientists there have noticed that turtle numbers may be growing so fast that they are eating the seagrass faster than it can grow back.

Is it good news or bad news that the turtles are doing so well?



Green turtle on a reef at Apo Island. Photo: MCP



What about coral reefs?

1 in 5

A huge survey filmed 371 reefs in 58 countries. On nearly 1 in 5 of them, almost no sharks were seen at all.

60-73%

That is how much five common reef sharks have declined worldwide. Where reef sharks disappear, rays often take their place.

Scientists are still working out exactly how losing sharks changes a coral reef. Keeping records of the sharks and rays we see, like MCP volunteers do, helps find out.



When scientists change their minds

For older students

2007: the idea

A study said that when big sharks were overfished off the east coast of the USA, cownose rays boomed and ate the scallops, and the scallop fishery collapsed.

2016: the check

Other scientists looked at the data again. The timing of the shark declines and the ray increases did not match, and the story did not hold up.

Good science keeps checking. Changing your mind when the evidence changes is a strength.

How we know: Myers and others, Science, 2007. Grubbs and others, Scientific Reports, 2016.



Which shark or ray are you?

Answer the five questions on your sheet. Count up your letters. The letter you picked most often is your match.

A

Mostly A

B

Mostly B

C

Mostly C

D

Mostly D

E

Mostly E

F

Mostly F



Mostly A

Whale shark

You are a gentle giant who loves to travel.

The biggest fish in the world. It filters plankton, fish eggs and small fish from the water, and travels huge distances. On MCP's reefs it is a visitor, not a resident.

Red List status

Endangered

How we know: IUCN Red List of Threatened Species



Photo: Matthew T Rader, CC BY-SA 4.0, via Wikimedia Commons



Mostly B

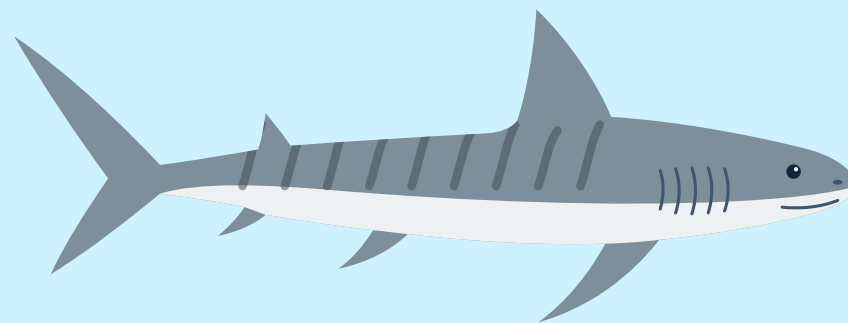
Tiger shark

You will try any food once.

Tiger sharks eat almost anything, from fish and sea turtles to seabirds. Their saw-edged teeth can cut through turtle shell. The stripes fade as they grow up.

Red List status

Near Threatened



How we know: IUCN Red List of Threatened Species



Mostly C

Bamboo shark

You love a quiet night in.

A small shark that hides in reef crevices by day and hunts crabs, shrimp and small fish at night. It can rest on the bottom and pump water over its gills.

Red List status

Near Threatened

How we know: IUCN Red List of Threatened Species



Photo: MCP volunteers



Mostly D

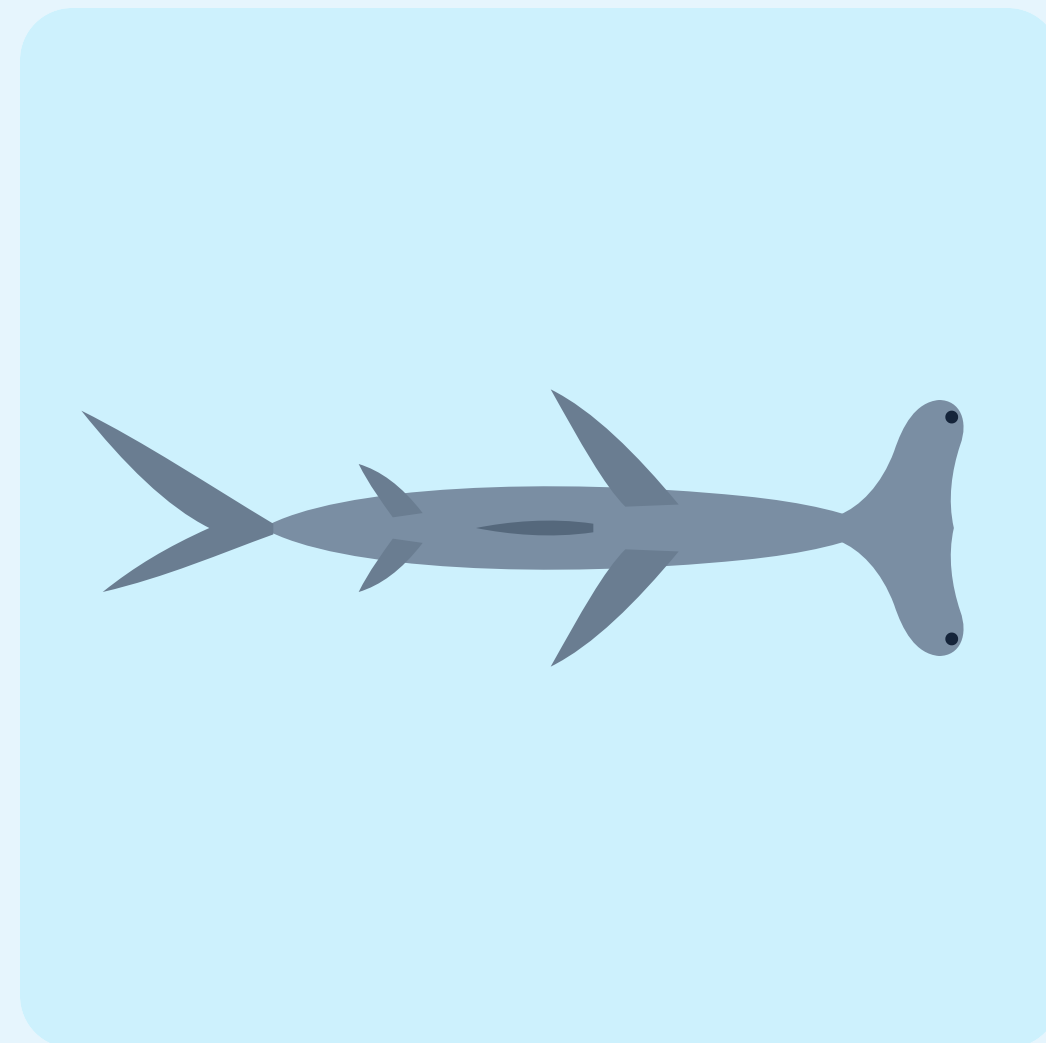
Scalloped hammerhead

You are happiest with your crew.

Scalloped hammerheads can gather in large schools. The wide head spreads out their electric sense, so it works like a metal detector. Their fins are among the most valuable in the fin trade.

Red List status

Critically Endangered



How we know: IUCN Red List of Threatened Species



Mostly E

Reef manta ray

You are graceful, and you like to snack all day.

Manta rays glide through the water filtering plankton. A female usually has just one pup every two to three years.

Red List status

Vulnerable

How we know: IUCN Red List of Threatened Species



Photo: MCP volunteers



Mostly F

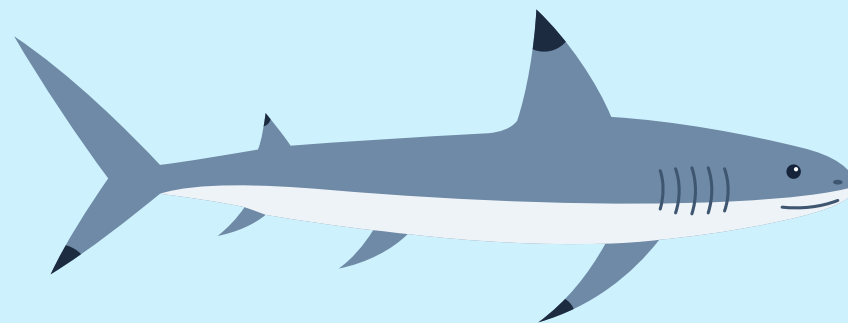
Blacktip reef shark

You are quick, curious and love the shallows.

Easy to spot by the black tips on its fins. It hunts small fish in shallow water around reefs and seagrass.

Red List status

Vulnerable



How we know: IUCN Red List of Threatened Species



Talk about it

Why does a reef need its sharks?

What could you look for to tell if a reef is healthy?

Why do scientists keep checking each other's work?

Which job would you like to have on the reef, and why?

Next time: sharks and people, why sharks are in trouble and what we can do



Photos and sources

Photos: bamboo shark, whale shark (slide 2), manta ray and green turtle by MCP volunteers, Negros Oriental. Feeding whale shark by Matthew T Rader, CC BY-SA 4.0 (creativecommons.org/licenses/by-sa/4.0/), via Wikimedia Commons. All illustrations drawn for this lesson by Marine Conservation Philippines.

Sources:

- Marine Conservation Philippines (2026). Frequent sightings of sharks and mantarays.
- Heithaus, M. and others. Shark Bay Ecosystem Research Project, Florida International University.
- Heithaus, M. and others (2012). Marine and Freshwater Research.
- MacNeil, M.A. and others (2020). Global status and conservation potential of reef sharks. Nature.
- Simpfendorfer, C. and others (2023). Science. Reported by Mongabay.
- Myers, R. and others (2007). Science.
- Grubbs, R.D. and others (2016). Scientific Reports.
- IUCN Red List of Threatened Species.
- Convention on Migratory Species. Whale shark.

Full links are in the teacher reading. Free to use and share for education. Made by Marine Conservation Philippines. More free lessons: marineconservationphilippines.org/resources/teachers-resources/

