

SYMBIOSIS GAME

Symbiosis can be defined as any kind of relationship or interaction between two dissimilar organisms. The most common types of symbiosis found in the ocean are mutualism and commensalism.

Mutualistic relationships refer to pairings who live and work together for mutual benefit.

A commensalistic relationship is one where one party in the relationship benefits, and the other is neither helped nor harmed by the process.

How to play

- 1. Print the pages single-sided. Cut to size, fold in half and glue together.**
- 2. Place all cards on the floor with the pictures facing up.**
- 3. Pair the photos of underwater animals that you think live together or have a special relationship.**
- 4. Turn the card over to find the answers and more information.**
- 5. To advance the game, try to decide what kind of symbiosis the animals have; mutualism or commensalism.**



Corals are animals providing a home for tiny algae called **zooxanthellae**.

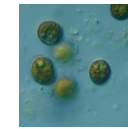
MUTUALISM



Corals



Corals and Zooxanthellae



Zooxanthellae

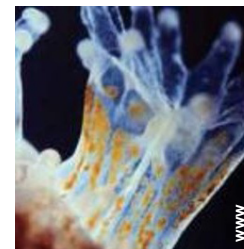


Zooxanthellae are microscopic algae living in the **coral** providing food and colour.

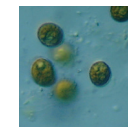
MUTUALISM



Corals



Corals and Zooxanthellae



Zooxanthellae



The poisonous tendrils of the **Anemones** provide **clown fish** shelter and protection from predators.

MUTUALISM



Clown fishes protect their **anemone** home, by chasing away potential predators. The fish also provide their home with tasty scraps and waste as a food resource.

MUTUALISM





Chris Roelfsema

Moray eel

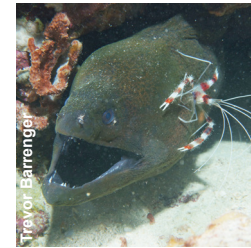


Moray eels will seek out **cleaner shrimp** and let them clean any parasites from their teeth and skin, giving the shrimp a free meal!

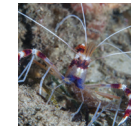
MUTUALISM



Moray eel



Moray eel and Cleaner shrimp



Cleaner shrimp



Chris Roelfsema

Cleaner shrimp



Cleaner shrimp are moray doctors! They will eat any parasites and dead skin from on **moray eels**, ensuring the eel stays healthy.

MUTUALISM



Moray eel



Moray eel and Cleaner shrimp



Cleaner shrimp



Eva McClure

Grouper



Look at those lips! **Grouper** allow cleaner wrasse to eat any dead skin or parasites they may have, providing **cleaner wrasse** with a tasty snack!

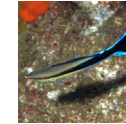
MUTUALISM



Grouper



Grouper and Cleaner wrasse



Cleaner wrasse



Chris Roelfsema

Cleaner wrasse



The **cleaner wrasse** helps keep the **grouper** healthy by eating any dead skin or parasites. You can often see the groupers hovering around “cleaning stations” as they wait their turn for a checkup.

MUTUALISM



Grouper



Grouper and Cleaner wrasse



Cleaner wrasse



Chris Rooifsema

Whale



May-gauthier_Unsplash

Barnacles

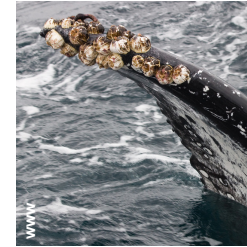


Whales are often covered in **barnacles**, these do not provide a direct advantage to the whale, however there is also no harm done.

COMMENSALISM



Whale



Whale and Barnacles



Barnacles



Barnacles love hitching a free ride with the whales. The **whales** take them through plankton-rich water, an important food resource and provide barnacles with a stable place to live.

COMMENSALISM



Whale



Whale and Barnacles



Barnacles



Sharks act as almighty bodyguards to the **pilot fish** by protecting them from other nasty predators. Surprisingly, they do not eat them.

MUTUALISM



Pilot fish



Pilot fish and shark

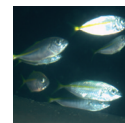


Shark



Pilot fish clean the nasty parasites from the ocean's apex predators - the **sharks!** Hence the reason they do not eat them.

MUTUALISM



Pilot fish



Pilot fish and shark



Shark



The bum of **Sea cucumbers** provide a home for pearlfish. The sea cucumber is neither helped nor harmed.

COMMENSALISM



Sea cucumber



Sea cucumber and Pearlfish



Pearlfish



Pearlfish have one of the strangest homes in the ocean - a **sea cucumber's** bum! By hiding inside the cucumber the pearlfish gets protection from predators.

COMMENSALISM



Sea cucumber



Sea cucumber and Pearlfish



Pearlfish



Chris Roelfsema

Decorator crab

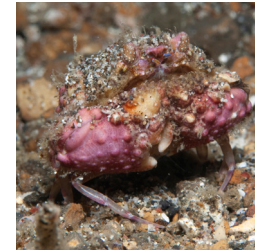


The **decorator crab** uses **sponges**, tunicate and algae to camouflage itself on coral reefs.

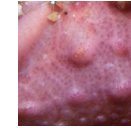
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Crab



Decorator crab and Sponge



Sponge



Chris Roelfsema

Sponge



Travelling on the **decorator crab's** back, the **sponge** is exposed to many feeding opportunities.

MUTUALISM



Crab



Decorator crab and Sponge



Sponge



Chris Roelfsema

Goby



The **goby** has superior eyesight. While the **pistol shrimp** is digging a burrow for them both, the goby keeps an eye out for predators and alerts the shrimp of any upcoming danger by flicking its tail.

MUTUALISM



Goby



Goby and Pistol shrimp



Pistol shrimp



<http://ourmarinespecies.com>

Pistol shrimp



Despite its poor eyesight, **pistol shrimp** are proficient diggers. They dig small burrows in the sand which act as shelter for themselves and the **goby**.

MUTUALISM



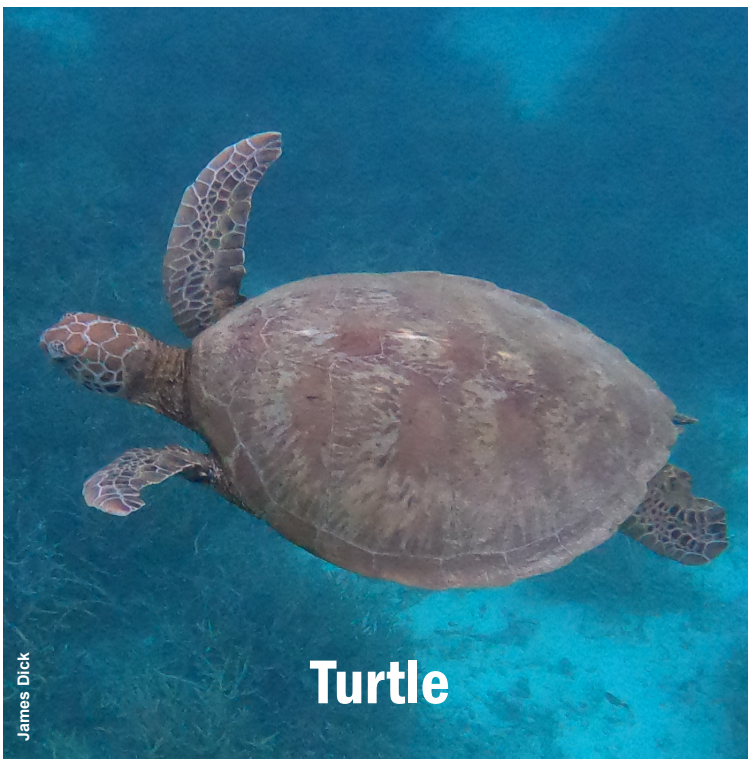
Goby



Goby and Pistol shrimp



Pistol shrimp



Turtles get cleaned of parasites by **remoras**.

MUTUALISM



The most obvious hitchhikers catching a ride on a **turtle's** shell are **remoras**. They use a sucking disc on the top of their heads to attach themselves to larger marine animals.

MUTUALISM

