



## Fun Fact Sheet - Why are Coral Reefs so Colourful?

1. Coral reefs are some of the most colourful places in the world. The bright colors we see are only part of the story since many organisms do not see light the same way humans do. Some organisms only see limited parts of the light spectrum while others see far beyond visible colours into ultraviolet light that we cannot see. The bright colors serve many functions including camouflage, defence and mate attraction. (National Geographic 2005)
2. Red is the first colour of the colour spectrum to be absorbed or lost underwater, which is why nocturnal fishes are usually a shade of deep red to orange to help them hide from predators (National Geographic 2015).
3. Small ornamental reef fishes are a beautiful variety of bright colours, however underwater in natural lighting these colour combinations blend into the colourful background of the coral reef and provide camouflage from predators (Marshall 2017)
4. Some reef fishes have very detailed and intricate patterns on their bodies. When these fishes school together the patterns confuse predators allowing the fish to retreat quickly, creating an obscure blur (Rosenthal 2017).
5. Many coral reef animals have chromatophores, skin cells which create the appearance of colour or patterns through pigment and light manipulation. Expressing different colours or patterns with their chromatophores can be used to attract prey, deter predators, or attract a mate (Kaufman 2016).
6. Many fish that are planktivores can see ultraviolet light, which makes plankton appear black in the water column and much easier to see during feeding (Lose et al. 2015).
7. Stomatopods, also known as mantis shrimps have the world's most complex eye with up to 16 different kinds of photoreceptors for visible light (what humans can see), ultraviolet light, and polarisation. Humans only have 4 photoreceptors (Marshall 2017).
8. Many reef fishes use colourisation as warning patterns to predators to keep away; Scorpionfishes have a flame red spot on their pectoral fins, Lionfishes flare their bold red and white pectoral fins, while Doctorfishes and Surgeonfishes highlight their bone spur (Campbell and Reece 2002).
9. The photic zone, or the top 500ft of the water column is where you find most of world's coral reefs where visible colour is determined by light intensity, turbidity, and depth (Marshall 1998)
10. Counterillumination or countershading is a behavior that many pelagic (oceanic) marine animals use to appear dark in colour if you look down at them (to blend in with the dark water or coral reef below) and appear light in colour if you look up at them (to blend in with the bright water or sky above)(Warrant 2004).
11. Most large predatory animals and fish living on coral reefs are colourblind and miss the beautiful colours, instead relying on countershading, colour contrasts and differing colour patterns to find food, attract mates, and defend themselves (Marshall 1995).