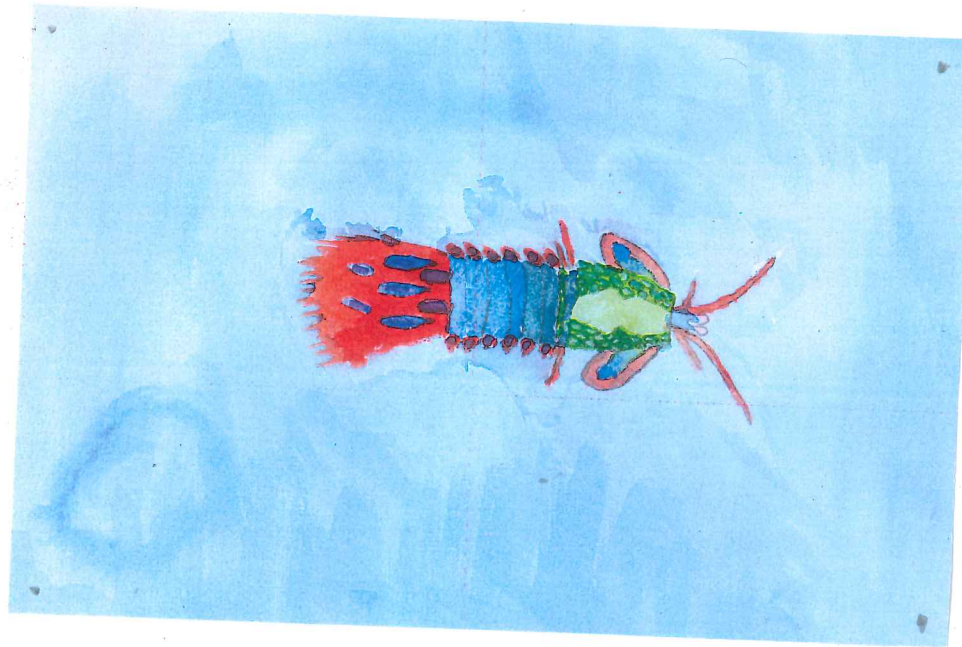




Crunchy the Mantis Shrimp

By Angus Burch

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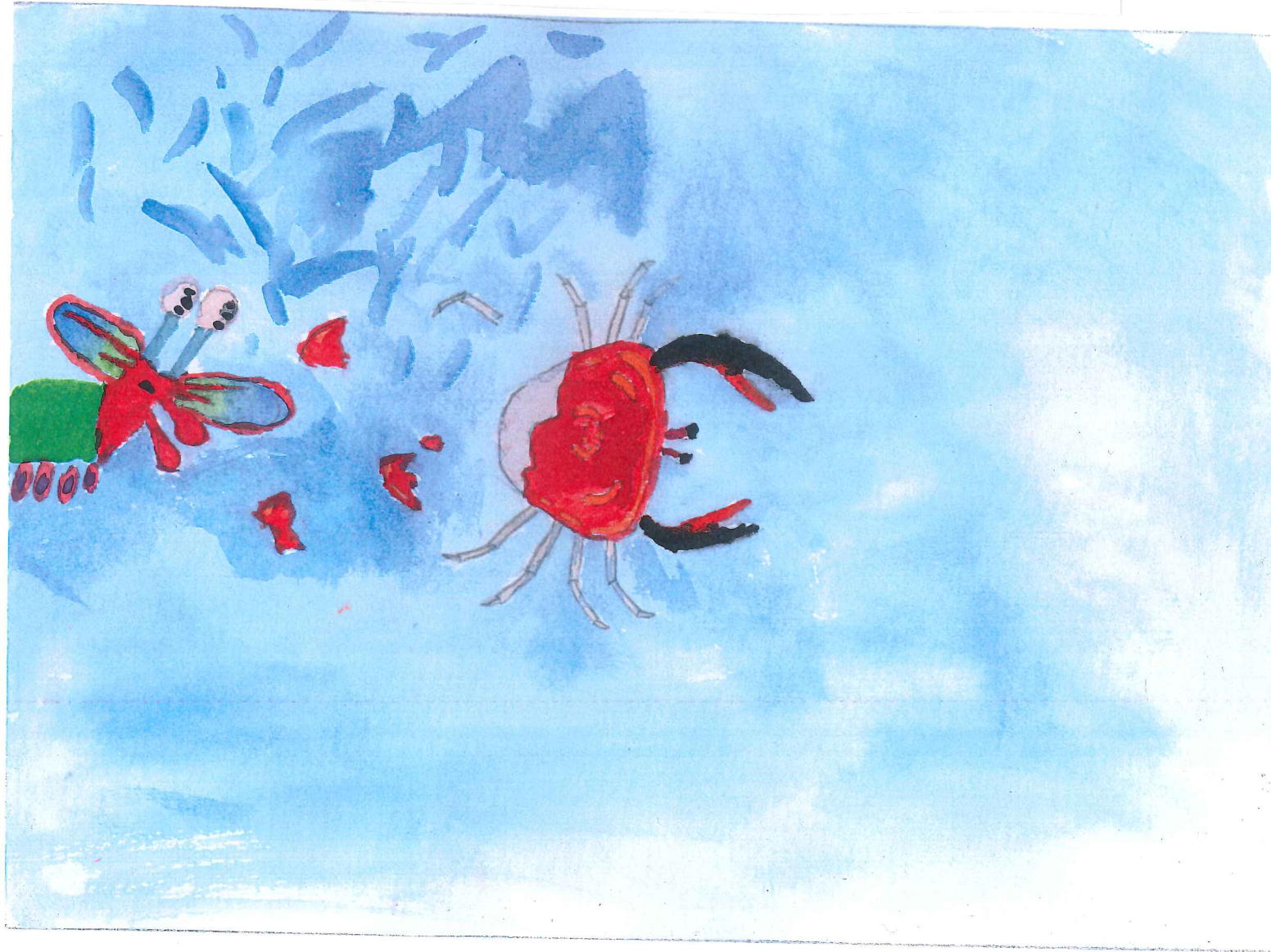
CRUNCHY THE MANTIS SHRIMP

CRUNCHY THE MANTIS SHRIMP

Meet Crunchy the peacock mantis shrimp.
She lives on a coral reef near Indonesia and
eats crabs and snails.



Mantis shrimp have a unique way of getting to the meat under shells. They use "fists" which can punch extremely fast to crack their prey's armor.



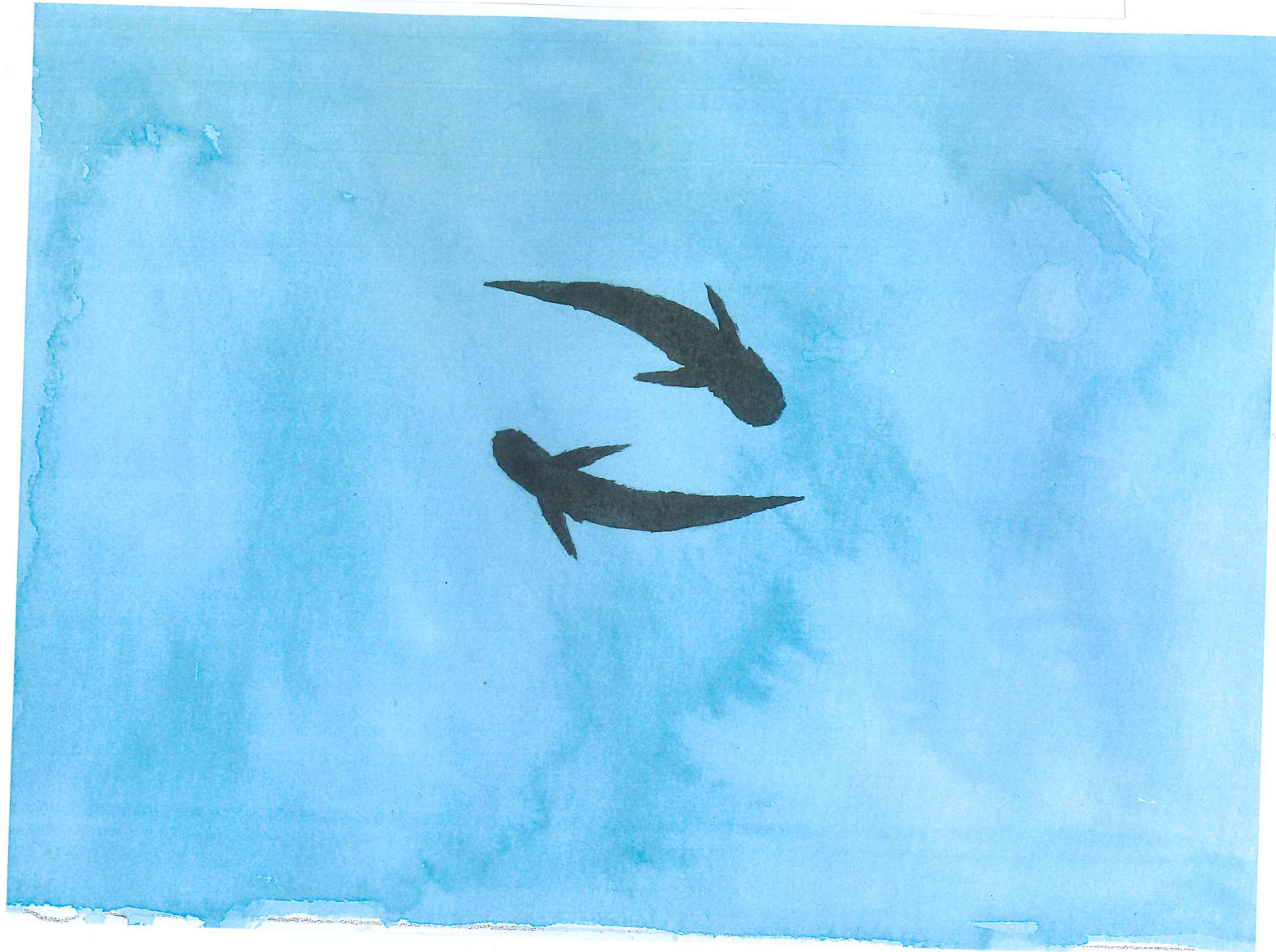
Crunchy, however, hasn't had much of a chance to use this talent lately, for her reef is bleaching, and running out of food...



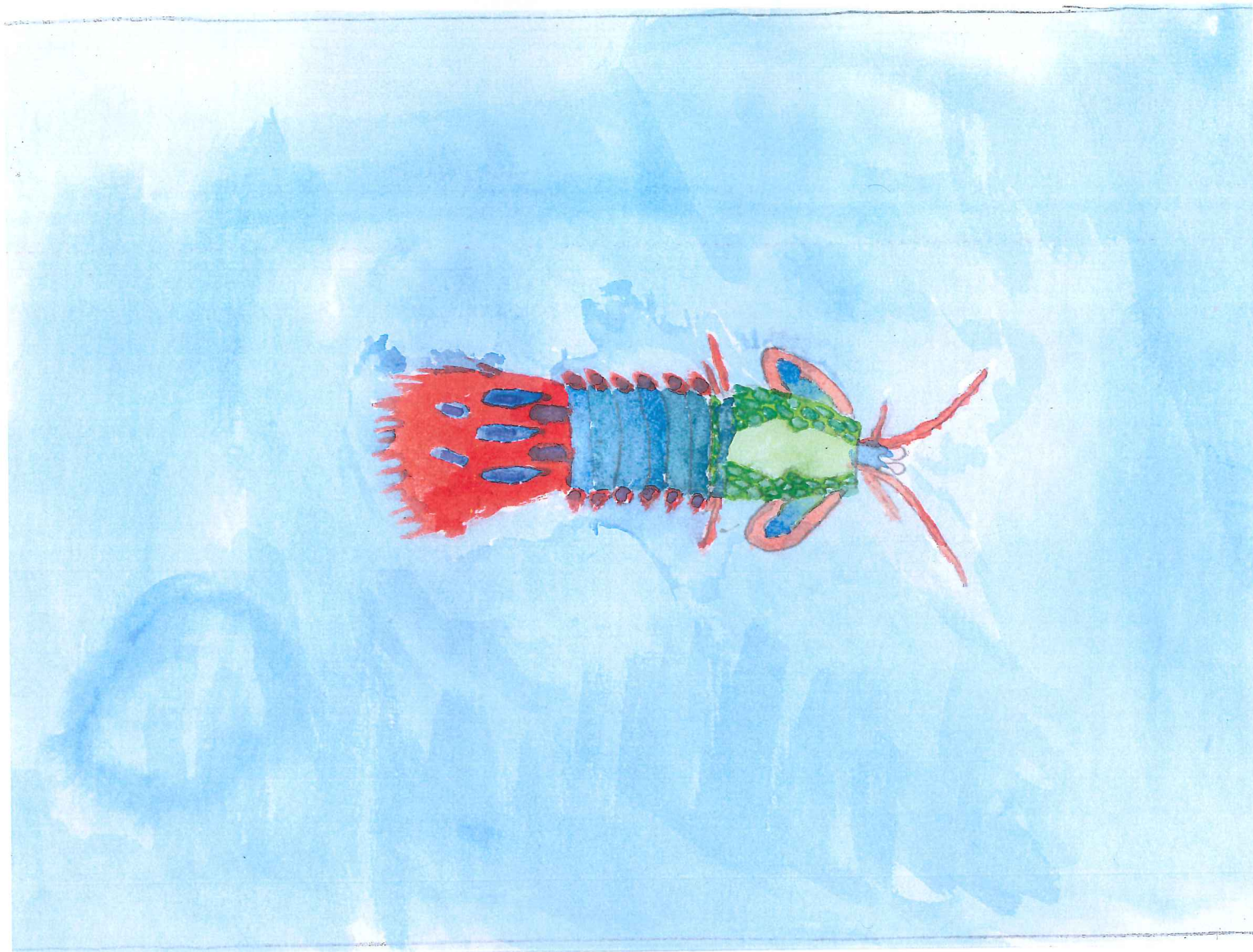
One day, after returning from another unsuccessful hunt, she realizes that if she stays here much longer, she'll starve to death. So, that night, she sets off to find a new home, leaving the deadened reef behind her.



Crunchy is swimming through Open Ocean
when a shadow falls over her. She looks up and
almost dies of fright, for circling above is a pair
of gigantic yellowfin tuna.



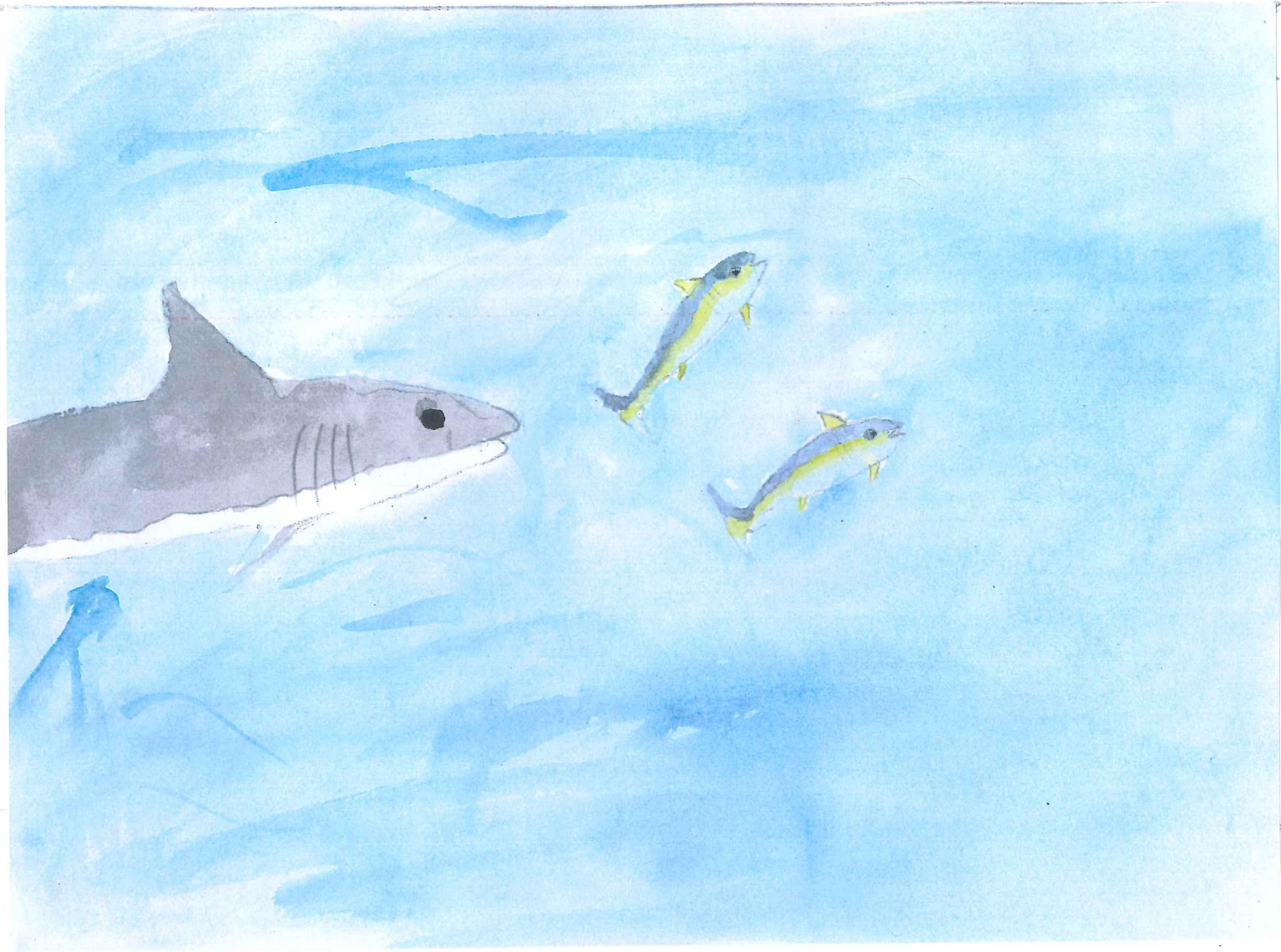
The tuna circle lower and lower, beady eyes fixed hungrily on Crunchy. There's nowhere to swim, nowhere to hide.



Suddenly, they dive, speeding downward like twin torpedoes. Crunchy turns away, waiting for the fatal impact...



But it never comes. Another shadow covers her, and she feels a rush of water as the shark speeds past, scaring off the tuna. Then, with a flick of the tail, the shark gives chase.



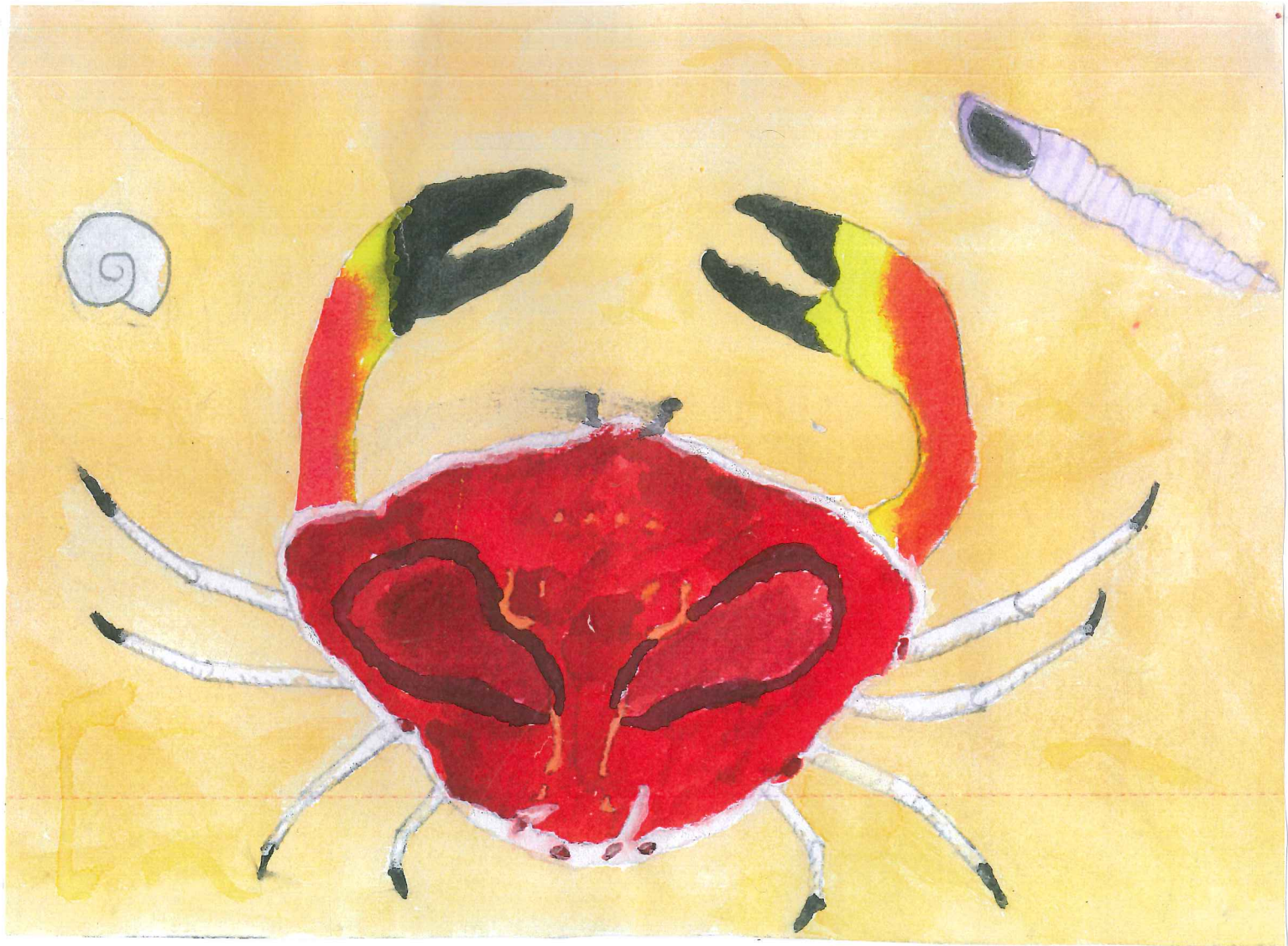
Days later, weak and starving, Crunchy spies a wall of seaweed ahead. She conjures the energy to push through.



There she stops and stares, for sprawled in front of her is a reef so enormous it stretches out of sight. Thriving coral swarms with tiny fish and crabs.



A small movement catches her eye and
she looks down. There, nestled in the sand is a
large crab.



Crunchy pounces, smashing the crustacean's shell
so fast the water around them boils and a flash of
light illuminates the scene.



She starts munching ravenously on the meat.
Finally, a decent meal.

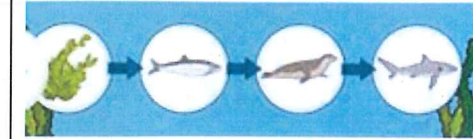


Science Concept 1

Food chain

Food chains are extremely important for the survival of most species. If any element is removed from the chain, it can sometimes result in the extinction of a species. In my story, the obvious food chain is this: the crab lives off plankton and algae; the shrimp eats the crab; the tuna (almost) eats the shrimp; the shark eats the tuna. The shark is at the top of the food chain, while the plankton are at the bottom.

This is a simple ocean food chain.



Science Concept 2

Cavitation

Mantis shrimp use cavitation to help deal out their deadly punch by producing destructive bubbles that quickly collapse and release energy as they do so. cavitation can cause serious damage. It can destroy ship propellers, pumps and turbines. With mantis shrimp, researchers think cavitation helps them break apart hard-shelled prey like crabs and snails.

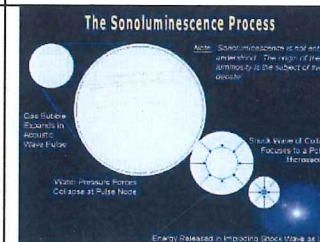
"Mantis shrimp are renowned for their unusual method of breaking shells with brief, powerful strikes of their raptorial appendages [fists]. Due to the extreme speeds of these strikes underwater, cavitation occurs between their appendages and hard-shelled prey."

~Patek and Caldwell~

Science Concept 3

Coral Bleaching

Sonoluminescence is the emission of a flash of light accompanying the bursting of a bubble in a liquid when sound waves are passed through the liquid.



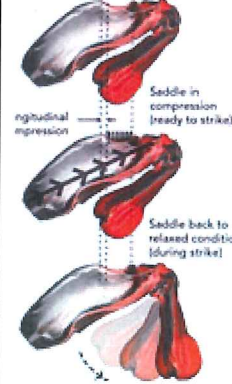
Science
Concept 4
Coral
Bleaching

Warmer water temperatures can result in coral bleaching. When water is too warm, corals will expel the algae (zooxanthellae) living in their tissues, causing the coral to turn completely white. This is coral bleaching. When coral bleaches it is not dead. Corals can survive a bleaching event, but they are under more stress, and are subject to mortality.

"Coral reefs represent some of the world's most spectacular beauty spots, but they are also the foundation of marine life; without them many of the sea's most exquisite species will not survive."
~Sheherazade Goldsmith~

Science
Concept 5
The Mantis
Shrimp's
Punch and
How it Works

The key part of a mantis shrimp's punch is a saddle-shaped structure on the "arm" just above the shrimp's club. This shape works a bit like a bow and arrow. The muscles pull on the saddle to bend it like an archer's bow, and when it is released that energy transfers into the club. It works because of a two-layer structure. The top layer is made of a ceramic, bone-like material, and the bottom is made of mostly plastic-like biopolymers. When the saddle is bent, the top layer gets compressed and the bottom layer is stretched. The ceramic can hold a lot of energy when it is compressed but is brittle when bent and stretched. The biopolymers are stronger and stretchier, so they hold the whole thing together.



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