

Saving the Coral Reefs

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The ocean is a very important environment on our planet. The ocean houses many of the world's animals and plants. Coral is an example of these animals. Although coral may seem like plants, they aren't. In fact, they are incapable of making their own food. The branches of the coral are made up of tiny animals called polyps (NOAA). Corals are among one of the most important living organisms in the ocean. When corals come together, a coral reef forms. Coral reefs are the most biodiversity ecosystem. Although they cover less than 1% of the ocean floor, they house more than 25% of marine life (Coral Reef Alliance). Corals also feed many animals, like parrot fish, who then excrete their waste as sand and form the white beaches we have today (Coral Reef Alliance). Corals also have many medical properties that help humans find care for diseases. Although coral reefs are very biodiverse, they are slowly disappearing. A major factor of this is global warming, which heats the water to a point that kills the coral. Also, many human interactions near coral may damage and kill the coral. Corals also grow in shallow waters to get the most sunlight they can get, but with humans polluting the oceans, sunlight is restricted to coral. To help this problem, a company called "Biorock" is making change and trying to bring back coral. Another company called "Seabin" invented an aquatic trash can that safely vacuums the ocean surface without hurting the life around it. I'll be further explaining the most famous reef, the Great Barrier Reef, discussing the job "Biorock" is doing to help save the coral reefs, how "Seabin" is working to clean the oceans, and how STEM helps in the oceanic problems,

The Great Barrier Reef is the largest coral reef still living on our planet. It is located on the east coast of Australia, and stretches 2,300 kilometers, and covers an area of 344,400 square-kilometers. . In fact it's so big, it's capable to be seen from space (Great Barrier Reef Foundation). The reef is bigger than the countries Italy and Japan. The Great Barrier Reef is also one of the seven natural world wonders. The Great Barrier Reef is so big that it houses 10% of

all the fish species, more than 600 types of coral, 215 species of birds, 133 varieties of sharks and rays, 30 species of whales and dolphins, 14 species of snakes, and finally, 87% of all the turtle species (Great Barrier Reef Foundation). But sadly, the Great Barrier Reef has drastically been dying. In 2016, 30% of the reef was bleached to death, caused by climate change heating water up, killing the algae that feed the coral, causing the coral to starve and become white, and in 2017, another 20% was bleached. This means that in two years, 50% of the reef has died (National Geographic)! If the climate continues, we might lose all of the Great Barrier Reef. But two genius companies, Biorock and Seabin, are willing to change the oceans and revive the ocean.

Biorock is a company led by Professor Wolf Hilbertz and Dr. Tom Goreau, doctor of the Global Coral Reef Alliance. Biorock has been working on their method of saving coral with a pioneering team for the past 30 years. The Biorock method evolved from the original Mineral Accretion Process, but what exactly is this? The Biorock process is “a new method that uses low voltage direct current electricity to grow solid limestone rock structures in the sea and accelerate the growth of corals providing homes for reef fish and protecting the shoreline. The electrical current causes minerals that are naturally dissolved in seawater to precipitate and adhere to a metal structure.”, according to Biorock.org. Biorock is very cost-efficient. It has already been used in more than 20 countries (Biorock). Biorock has also collaborated with the multi-millionaire game company, “Minecraft”. In June 2018, Youtubers, mainly focused on Minecraft gaming, such as StacyPlays, and high school students in Monterey, Mexico, made a group called “Coral Crafters”, working with Biorock, to celebrate Minecraft's new “Aquatic Update”. The Coral Crafters designed buildings in the Minecraft software, and six buildings were picked and built in real life with the engineers in Biorock. The Biorocks were then released in Cozumel,

Mexico (Minecraft). The goal of this is revive the coral reef near Cozumel, which has recently been dying off. Although Biorock revives the coral reef, coral reefs need a clean ocean to live in, and that's where Seabin comes in.

A Seabin is a floating trash can that collects sea debris. The Seabin was invented by two Australian surfers who wanted to clean the oceans, Andrew Turton and Pete Ceglinski (Seabin). The Seabin is to be located near beaches, docks, or marines. The Seabin flows along with the ocean current picking up debris. Water is sucked into a catch bag, with a submersible water pump capable of displacing 25,000 LPH, connected directly into a 110/220V outlet. The water is then pumped back in the ocean, clean, leaving the debris in the catch bag (Seabin). The Seabin is capable of catching 1.5 kg of debris per day, but it can catch a total of 20 kg. The trash is then collected by the Seabin team, analyzed, and recycled. The latest version of the seabin is capable of cleaning around a 50 meter radius (Seabin). The goal of the Seabin company is "have pollution free oceans for our future generations." (Seabin). In having the ocean clean, the coral have a clean and safe ocean to live in.

These two inventions are crucial in helping the coral to survive in the ocean. These two inventions have STEM properties. The Biorock is mainly to do with science and engineering. The engineers of Biorock would create a temporary rock that contains an electric current to attract minerals in the ocean to form limestone and start a home for the coral. The Seabin mainly demonstrates the all the properties in STEM. The workers would build an electronic aquatic trash bin to collect and filter the water. The bin is powered with pumps and batteries. The workers estimated roughly how much trash the bin can pick up in a day, and multiplied that by 365, to find how many kilograms of liter the bin would pick in a year. STEM is very important in

solving problems in today's society. Every aspect of STEM helps students and experts to try and invent new technology that'll help solve problems in today's world.

In conclusion, I've discussed the importance that coral has in the world. Corals are animals that'll join to form coral reefs that help the world dramatically. The coral reefs only cover 1% of the oceans floor and house more than 25% of all marine. In losing the coral reefs, many fish would die and new medical advances would slow down. Without coral reefs, the ocean would be a less attractive place. The Great Barrier Reef houses most of the aquatic life, but sadly, 50% of the reef has been bleached. The two companies who are working on bettering the ocean are Biorock and Seabin. Biorock focuses more directly in helping the coral, while Seabin is more directly in helping to clean the ocean, but in cleaning the ocean, Seabin provides a clean place for coral to thrive.

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