

MARINE SCIENCE INSTITUTE

A trip aboard MSI's Robert G. Brownlee research vessel

Ixchel Aguirre

JOE SERNA JR. CHARTER SCHOOL

I had the opportunity to go on the Robert G. Brownlee research vessel with my sixth grade class. We got on the boat at the Redwood City dock and spent the day on the boat.

The trip was very enjoyable and educational. While on the trip I enjoyed learning about the San Francisco Bay and every-

thing in it. First, I went to the hydrology station and learned about the water in the bay. We took surface and depth water samples and tested the temperature, density and salinity. Second, we went to the plankton station. I was able to throw the plankton net into the bay. Then we used a microscope to see and find the different plankton such as meroplankton and holoplankton. Meroplankton isn't plankton for

its whole life but holoplankton is.

After that we went to the benthos station. Benthos is the substance at the bottom of a body of water. We used a mud grab to grab mud from the bottom of the bay. We touched the mud and put it on our face. We even took a pledge to protect the Bay and all the animals in it. One of my favorite parts of the MSI trip was petting invertebrates. Invertebrates are animals with no back-

bone. For example I was able to pet a crab and a shrimp.

Last, my favorite part was catching fish with a giant green net. We caught two fish such as a diamond turbot and a California halibut. We also caught two shrimp, and one leopard shark! I was able to touch all of them and identify them, including a bat ray! My trip to the research vessel was awesome and I had the best experience of my life!

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chaotic than it usually was, and for someone who doesn't get seasick it's fine, but for my peers who don't feel the same way it wasn't so great.

We eventually started our first activity, my group at least. Oh yeah, I forgot to mention, but we were all split up into three groups, each one being captained by a different scientist. Ours in this case was Marria.

Anyway, at the back of the boat was the place where we would catch fish and examine them. They needed volunteers to throw the net over and me and my classmate, Diana, volunteered to do the job. After we had thrown the net over, the people in our group who didn't throw the net over, with help from one of the other groups, pulled in the net. It was really cool.

Before we pulled in the net, they talked to us about all this sea wildlife. We ended up catching a bat ray, commonly misassociated with the stingray.

After that, we went to the front of the boat and pulled up some water we got from dropping containers into the bay. We went inside, which was very appreciated after we had to spend the entire fishing station outside, with our hands in cold water, freezing. So let's just say it was so nice to finally go inside.

After we got inside our scientist, Marria, put the water under a microscope and we saw a huge variety of different plankton, and this is what I want to focus on here today. Before this trip, I just always kind of figured plankton just tried to steal the Krabby Patty formula, but they do so much more than that.

Unlike common belief, trees are not the main source of oxygen on planet Earth; it's actually plankton. Plankton actually produce 70-80% of the world's oxygen, amazing right? I was shocked, maybe because I was made to believe that plankton were reliant on their robot wife Karen.

I also learned how necessary plankton are to other animals' diets. Many small fish eat them and use them as nutrients to get bigger. Not only that, plankton account for about half of all photosynthesis in the world. Marria, our leader, told us all of the different plankton in the world, phytoplankton, zooplankton, meroplankton, and holoplankton, the last two being a subcategory of zooplankton.

Phytoplankton are some of Earth's most critical organisms. They are good nutrients for other sea life and are the plankton that produce the most oxygen.

Then there's zooplankton. Zooplankton are tiny little organisms that go wherever the current takes them. Of course they can swim a little, but it really doesn't matter because of how weak they are. Zooplankton are usually tiny little animals like shrimp or baby fish.

Then there's meroplankton and holoplankton, the main difference between them being their lives and what they will become. Meroplankton, unlike holoplankton, will eventually become an animal such as a starfish, sea urchins, fish, etc. On the other hand there's holoplankton: Plankton who will be plankton for their entire lives and not evolve into anything else.

Each and every one of these planktons are important and all interesting to learn about. I would like to thank the MSI scientists and my school for letting us go to such a cool trip.

What is it like to spend a day on the MSI research vessel?

Maria Romero

JOE SERNA JR. CHARTER SCHOOL

Visiting the MSI was a really fun experience. You might not know what the MSI research vessel is. The MSI research is a four-hour trip on a 90-foot research vessel which is a boat that takes you around San Francisco Bay. When they first told us about the study trip I wasn't sure if I wanted to go because I had never been on a boat, but I realized that it was going to be our first study trip in about two years so I decided to go. I was really nervous because like I said it was my first time on a boat. When we got there I was amazed by all the boats they had there and I was even more nervous but excited at the same time. The reason why I was nervous was because when I was smaller I would get carsick so I was afraid that I would get seasick on the boat. Once I got on the boat I was relaxed and I wasn't that scared anymore.

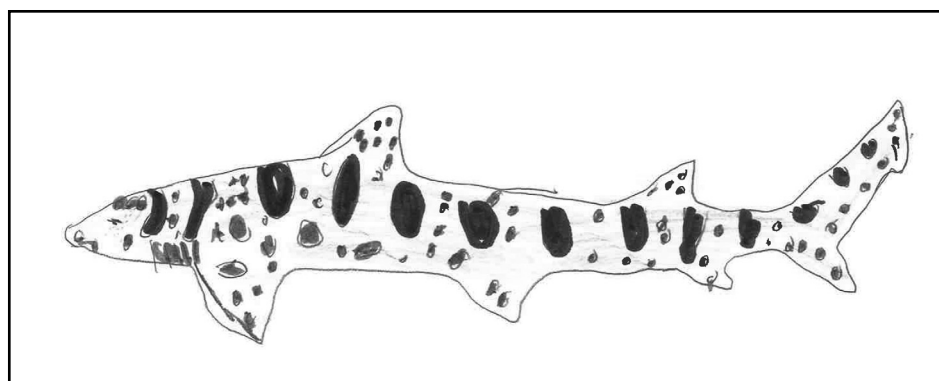
When we got on they took us straight to the bottom deck and made us put our lifejackets on. After we had our lifejackets on, they made us sit down and they talked to us about the safety rules. When I felt that the boat started moving, my heart started beating fast because I wasn't sure how I was going to feel since it was my first time on a boat. Once our instructor started talking I was relaxed and I wasn't nervous because I felt like it wasn't bad and I tried distracting myself from worrying about what if I got seasick. The instructor talked for about 30 minutes and then they started naming the people who were going to be in a group and who their instructor was going to be. There were four different instructors but the instructor I had was Kyrie. The students who were in my group were Jesse, Adrian, Jocelyn, Noely, Emily, and Gloria. Once everyone was gathered up with their groups and instructors, they started heading to the main deck where we did all the activities.

We did a couple of activities and I found them really interesting. We had activities based on ichthyology, benthos, hydrology, and plankton. I had lots of fun and learned a lot from each station but one of my favorite stations was the one that was about ichthyology. The reason why the ichthyology was

my favorite station was because I found it interesting how there are lots of different types of fish. In that station, we got to touch and identify what type of fish we had. I also like that station because it was really fun when we had to work with our group to get the net out of the water. Even though it was slippery and I almost fell down, it was still really fun. In that station, we also got to touch a bat ray and I learned that touching the bat rays wing that is closest to you is the safest way to touch a bat ray.

Another station that I found interesting was the benthos station because I got to help take the mud from the surface of the bay. In that station, we also got to learn how the bay started forming and getting bigger which was because of the Gold Rush. We also got to touch and look to see if there were any sea worms in the mud and we found a lot. It felt weird and I was kind of scared because I'm scared of any small animal but it was really interesting getting to find them in the mud. Something else we did in that station was that we made a promise to help keep the bay clean by recycling and doing other things. After we made the promise we had to put some mud on our forehead and when it dried up it felt like a clay mask. All of the stations were fun but those are two of the stations I enjoyed the most.

After we finished all those four stations, when we were about to get back to where we got on the MSI research vessel they took us to the bottom deck once again because they told us they couldn't end the trip with us on the main deck. While we were waiting for everyone at the bottom deck with our instructor, we played a game that was like hangman but instead of the man it was a fish. Once everyone was back on the bottom deck the main instructor, Kyrie, wrapped everything up and we told her some things we learned. When we were finally back, we took off our lifejackets and placed them under the chairs. After that we got all of our stuff, we said bye to all the instructors, and got off the boat. I would say having the opportunity to go on the MSI RV was one of the best experiences I've ever had. I found it fun, interesting and if I had the chance to go on that study trip again, I would go for sure!



KADEN HEATHINGTON/JOE SERNA JR. CHARTER SCHOOL

Finding leopard sharks in San Francisco Bay

Diego Santillan

JOE SERNA JR. CHARTER SCHOOL

When I went on my study trip with my classmates we threw the net out the back of the boat. When we were pulling up the net we caught a leopard shark! The leopard shark had little dots by its mouth. The

dots are for sensing heartbeat. The leopard shark had rough skin, it felt like sanding paper. If you didn't know, leopard sharks have five gills on each side of their head but sometimes they tend to have six to seven gills which is rare for them to have. A leopard shark's diet is clams, crabs, fish eggs, etc.

Spider crabs: Interesting creatures in the bay

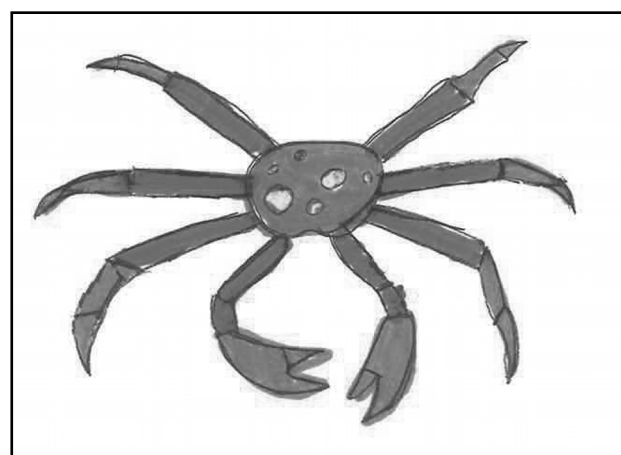
Ronan Carr

JOE SERNA JR. CHARTER SCHOOL

One interesting animal that I saw on the research vessel was the spider crab. The spider crab can live up to 100 years which is very crazy. The spider crab that was on the boat was a very small and young one that would fit in the palm of our hand. The length of a fully grown spider crab can range from 3.3-3.9 feet which is very long. The spider crab can weigh up to 40 pounds. Spider crabs claim the title of the largest crab. You could tell that the crab we saw on the research vessel was very young because it was a small crab. I think it is crazy that the spider crab can go from a tiny egg to a 3-4 foot crab.

The life span of a crab is very long. They live up to 100 years while feeding on animals such as fish or invertebrates such as crustaceans. Even though the spider crabs can live up to 100 years they do not survive very long without injury in their lifespan. The spider crab is very common in oceans and bays all around North America and is very much enjoyed when people eat the spider crab. A lot of people do not know this, but the spider crab is edible and tastes very delicious to many people.

The appearance of the spider crab is very cool. Its shell is often designed with various spines and tubercles (usually on bones or



ANGEL FERREYRA/JOE SERNA JR. CHARTER SCHOOL

the surface of the crab) and clothed in algae debris and small invertebrates held in place by hook-like hairs.

The crab has white, narrow claws that move slow and are not very strong, and has a tapered snout and short eyestalks. The common spider crab has a khaki-colored, triangle-shaped shell that measures about four inches front to back and features a median row of nine low spines. The head of the spider crab which is very cool is beak-shaped.

The reproduction and life cycle of a spider crab are very interesting. The spider crab must molt (molt: shedding old skin or shell to make way for new growth) to grow. They usually molt in large pods in the fall and hibernate in dense patches in the winter. They mate in

large groups in the season of spring. The colors of the eggs are bright orange to red when laid but then turn brown later during the development, which takes around 25ish days. It is very crazy how fast the spider crab gets in just a little amount of time.

It was very cool how we got to feel the spider crab on the research vessel because the spider crab was always moving around in the water and looked very active. There was another crab that looked like the spider crab but it was a different type of crab and it was a lot more furry. I think it is also cool that the spider crab can be eaten because it goes from just claws and meat to people being able to eat them and have them be enjoyable. In conclusion, the spider crab is a very interesting creature in this world.

Catching bat rays on the MSI trip, plus some fast facts

Vanessa Mendoza-Sanchez

JOE SERNA JR. CHARTER SCHOOL

On April 12, my class got the opportunity to go on a field trip to the MSI research vessel. We learned about and caught a couple of bat rays.

The Marine Science Institute staff had to take the bat rays out of the net, and one of the MSI staff mentioned that there were a few bat ray "barbs" stuck in the net. Barbs are the sharp protection hook that bat rays use to sting species in case they're in danger.

Because of that, the MSI staff had to be really careful when taking the barbs out

and putting them in small jars with tweezers, because the barbs can still sting and release toxins.

If someone were to get stung by a bat ray they would experience intense pain, nausea, weakness, and fainting, in rare cases a person might also have trouble breathing and even die.

Those barbs will eventually grow back just like how a squid's arm grows back after getting hurt or accidentally cut off, meaning that a bat ray is able to regenerate.

At the end of the field trip, we were able to touch a small bat ray. The bat ray felt wet and it also felt like rough sandpaper.

The history of the Marine Science Institute and its research vessel

Jazmin Carvajal and Alexandra Geronimo

JOE SERNA JR. CHARTER SCHOOL

The Marine Science Institute is an amazing opportunity. It is located in Redwood City. But the vessel can take off in Richmond, San Francisco, Rio Vista, and Antioch.

The main founders of the Marine Science Institute are Robert E. Rutherford (1927-2021) and Carolyn Rutherford (1930-2010).

Their mission was to cultivate responsibility for the natural environment and our human innovation.

Some programs that are available to the public are: in-person camps, after-school programs, seasonal camps, and little learner opportunities. Some special events are: group dynamics and team building. Other popular events that you may also participate in are public outings, birthday parties, and staff retreats.

The main focus of the MSI was to put students in physical activities that would help them have a natural sense of curiosity. The discovery voyage was the MSI's first program and had lots of success. In the first year of the discovery voyage, they served about 4,000 students.

In 1992 they created land-based programs that include shore sides, in land voyage, and tide pool programs.

The research vessel was put in-

to service in 1998. It can manage 50 students. The ship's engines were originally built to last 30,000 hours.

The ship has been going on for 100,000 working hours. It has been upgraded to a new eco-friendly engines.

Overall the Marine Science Institute has provided an amazing opportunity for all those around. As of today, they have educated 50,000 students and adults in their programs.