

MARINE SCIENCE INSTITUTE & MORE

MSI: Studying fish at the Ichthyology Station

Eirelle Cash
WOODBRIDGE
ELEMENTARY SCHOOL

One of the favorite stations we participated in during our MSI Discovery Voyage study trip was the Ichthyology Station. Ichthyology has to do with the study of fish.

This was the station that my peers and I looked forward to most. First, we were excited to be able to cast out a huge fishing net and drag it behind the boat for a short period of time. Then we were able to pull it in to see what we caught!

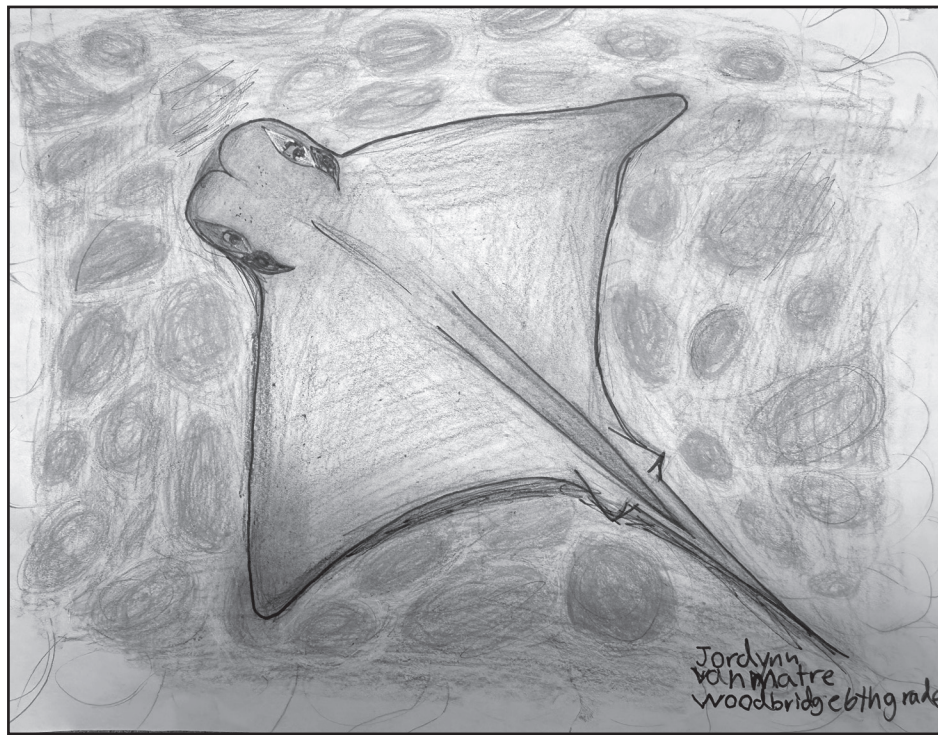
We had to work as a team and walk in a circle while we pulled the rope. As we worked to pull it in we chanted and moved in a circle, putting the rope

into a barrel. Each group caught several fish, one group caught a bat ray, and another group even caught some tiny jellies!

After we pulled in our net our catch was gently released in the tanks located at the stern of the boat. We were able to examine up close what we had caught!

Then the MSI instructors separated some of the fish we had caught into smaller buckets that we were able to examine even closer. We learned the names of all the different fins and parts of the fish. Then, together with our small groups, we used a dichotomous key to identify which types of fish we had caught.

The Ichthyology Station was definitely the highlight of our trip!



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MSI Trip

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the estuary and how we are connected to it. The rotations consisted of the Benthic Station, the Ichthyology Station, and the Hydrology and Plankton Station.

As we rotated through three stations throughout the day, we were able to use the scientific method and research equipment to examine different types of life in the bay. We learned that the San Francisco Bay contains brackish water, which is a mix of salt and freshwater.

The emphasis of our Study Trip was Human Impact on the Bay. We learned that some of the ways humans can negatively impact the bay is through introduction of non-native invasive species, litter and other forms of pollution, and modification of the bay's shoreline.

Our biggest takeaway from the study trip is that we need to all do our part to respect and take care of the bay and our watershed.

Young

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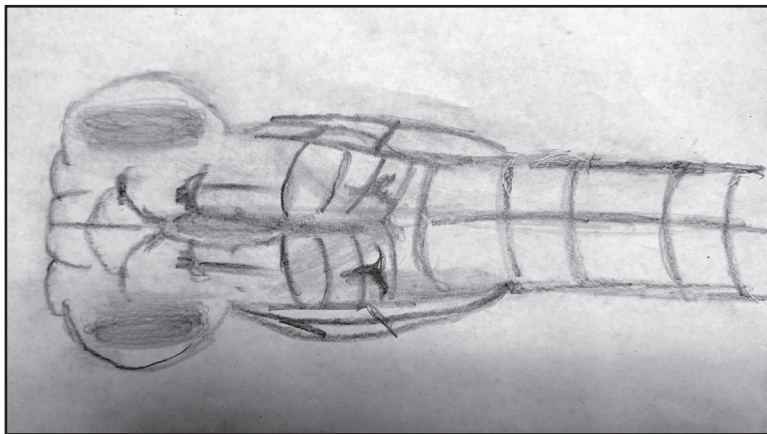
are fortunate to live in an area where we are close to the mountains, the Mokelumne River, the greater Sacramento River Delta, and the San Francisco Bay. We are also fortunate to live in an agriculturally rich area. So many jobs in this area center around the agriculture of our region, so teaching our students about the watershed and the impact of our decisions, will only help them better steward this wonderful place we live and learn.

MSI: Taking a closer look at the Hydrology and Plankton Station

Gabby Martinez
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What I learned from our Marine Science Institute study trip is that there are so many different kinds of fish and other marine life that call the San Francisco Bay their home. Some that we are more familiar with are sturgeon, halibut, leopard sharks and stingrays. But there is one type of organism I had no idea were living in the bay, and that is plankton.

You're probably familiar with Plankton because of the popular cartoon, "SpongeBob Squarepants," where one of the characters is actually based on an actual type of plankton, but did you know plankton are actually microscopic drifters that live in our lakes, rivers, ponds, and oceans? The word "plankton" is Greek for "drifter." Plankton are considered drift-



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ers because they do not swim, but instead are carried by the tides or currents.

During our MSI Discovery Voyage study trip, one of the stations we participated in was the Hydrology and Plankton Station. During this rotation, we used a Van Dorn bottle to

retrieve water samples from different depths of the bay. We discussed what influences water quality and how it can impact the organisms living in it.

We also studied and compared the water samples. First we took the temperatures, then we measured their salinity, which is

the amount of salt in the water and then measured the density.

Next, we used a microscope to examine the plankton that live in the water. Plankton are the considered marine drifters because they do not swim, but are carried along by the tides and currents. Plankton are microscopic, but these tiny organisms are the foundation of the freshwater and seawater food pyramids.

There are two types of plankton: phytoplankton, which are plants and zooplankton which are animals. Some examples of the plankton we saw under the microscope are Chain Diatoms, Cyclopoid Copepods, Rotifers, Tintinnids, and Jellies.

Observing the plankton and watching them move about in even the tiniest drop of water on the slide was exciting. It also goes to show how important each every drop of water is.

MSI: Digging deep into sediment science at the Benthic Station

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During the MSI Discovery Voyage study trip, there was a rotation that we all participated in called the Benthic Station. My class and I learned that this station had to do with the bottom of the San Francisco Bay.

In this station we used a Peterson Mud Grab to collect some of the sediment and mud from the bottom of the bay, the benthos. Once we pulled the Mud Grab back up to the boat, we opened it up over a bucket and the sediment was split between each student. During this time, all of the students got to touch

and explore the mud samples.

Next, we used a hose to wash the sediment away through a screen. This allowed us to see the organisms that were in the mud. The organisms that live in the mud are invertebrates, which are animals that do not have a backbone. One type of invertebrates we discov-

ered in the mud from the bottom of the bay were tube worms.

We also learned that the floor of the bay and other organisms that live there can be a good indicator of the overall health of the bay. A healthy sea-floor has many decomposers. This is important because the decomposition of organic matter is

what provides nutrients like phosphate, nitrates, and iron in the water. A healthy bay floor is a sign of a healthy ecosystem.

One of the most exciting parts of this station was when we took an oath to never harm the marine life living in the estuary, and by agreeing we put mud from the bay floor on our face.

Q: How does your daily life affect our watershed? In what ways could you change what you do to protect our watershed?

A: My kids would tell you that I am a stickler for them taking shorter showers, because of how much water it wastes. But in a bigger sense, I need to weigh heavily the impact of decisions I make about using chemicals to fertilize plants and our lawn. Assuming the decisions I make have no impact on the health of our watershed would be unwise. Instead, as a family and a member of this community, I need to value this unique place we all live in and take the little steps to protect our watershed, since it feeds the plants and animals we eat, as well as the water we drink. Every little step we take, when combined with the large number of people who live in our area, will protect our precious watershed for future generations.

Swan Has Seen This Before

Adalyn Akin
VINEWOOD ELEMENTARY
SCHOOL

Paddling along the rocky shore Puffy clouds reflected my figure The reeds, almost as tall as me, cast a misty glow The ducks, swans, and geese find comfort within them I would love to experience this for the first time again

Storm Drain Detectives keep watch over the Mokelumne

By Mia Gonzalez and Marwa Khan
WOODBRIDGE ELEMENTARY SCHOOL

Storm Drain Detectives is an educational program in which the City of Lodi partners with local students and their teachers to collect and test water samples from Lodi Lake each month. The purpose of the program is to educate people on how our City of Lodi storm drains impact the water quality of the Mokelumne River.

Water that goes down the drains in our bathrooms and

kitchens heads to the water treatment facility. To keep the streets of Lodi from flooding during rainstorms, a storm water system has been engineered to send rainfall into the Mokelumne River or into the Woodbridge Irrigation District canal system. In a perfect world this wouldn't be a problem, but in the real world, storm water has the potential to also carry street pollution and fertilizers from our lawns to our local waterways, untreated.

Twice a month a team of students and teachers from differ-

ent schools head out to Lodi Lake to monitor the water quality at different sites. When we go to Lodi Lake we take samples of the water and run a series of tests on it to give us an idea of the overall health of the water. We take the temperature of the water, air, and find the pH and nitrates levels. We also use an EC and a DO meter to test the dissolved oxygen, and when we return to school, we take a small water sample and put it in an incubator. We use the incubator to see if any bacteria grows from our water sample.

We also make our own observations and record notes about possible human impact in the area, such as trash and other signs of human activity or presence that could impact the water quality. Once we record our data, we head back over to the Discovery Center to test the turbidity, or cloudiness, of the water and then grade all of our data to give us an idea of the overall health of the water.

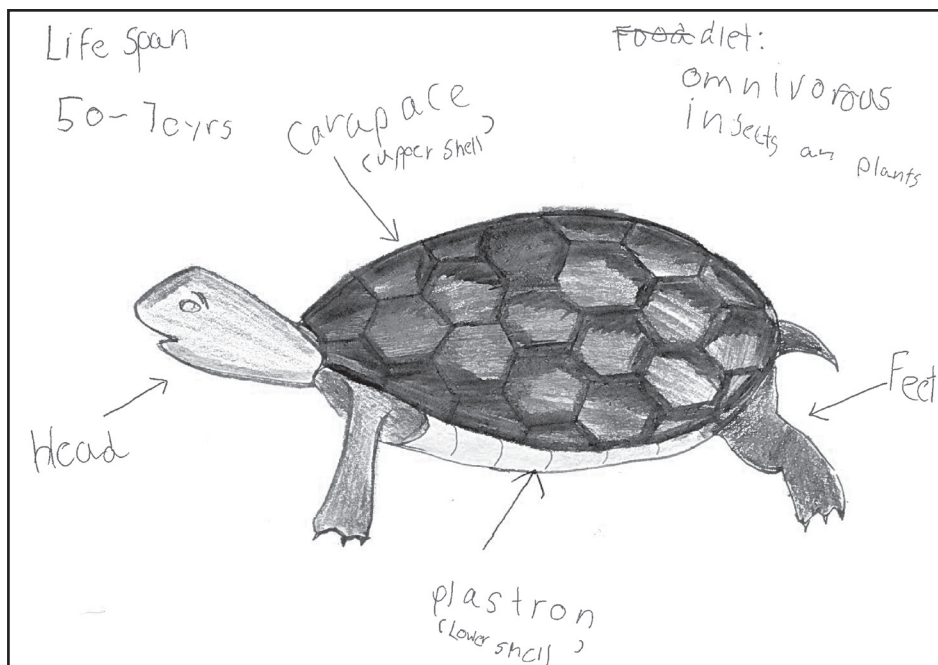
Storm Drain Detectives is an exciting way to bring environmental science to our classrooms.

Mouse



KATHRYN MOORE/VINEWOOD ELEMENTARY SCHOOL

Western Pond Turtle



ZANE ZEER/REESE ELEMENTARY SCHOOL

Facts about plankton

Christian DeSantiago
HERITAGE ELEMENTARY SCHOOL

1. Plankton are so light that they can walk on water.
2. Most plankton are less than

an inch long.

3. If plankton bump into a hard object, they may attach themselves and evolve into a barnacle.

4. Plankton are microscopic.
5. Phytoplankton use light to make sugar and use it to eat.

6. Plankton are important to the food chain.

7. Some of the planktons' predators are humpback whales and sharks.

8. Plankton are mostly found in oceans, seas and in fresh water.