THE Mokelumne Current

MAY 2022

Cutting carbon can help the planet

Maeher Dhaliwal
TOKAY HIGH SCHOOL

The world is in serious danger. If our society does not try to limit the amount of carbon we emit, there could be serious consequences. Every year, about 43 billion tons of carbon gasses are released into the atmosphere, which causes things like climate change to get worse.

Climate change results in the death of animals, weather conditions becoming more severe, and the increase in sea levels.

Thankfully, there are three effective ways to take carbon dioxide directly out of the atmosphere that might just save our society.

Firstly, the cheapest method of capturing carbon is restoring natural ecosystems. Natural ecosystems are known as "carbon sinks," which is just another way to say that they absorb carbon naturally. These ecosystems include plants using the carbon dioxide as food in photosynthesis, and then producing oxygen as a byproduct.

According to Lawrence Livermore Labs, over 90% of the land in California is workable land, which means that trees and other plants can be placed there. This gives plenty of space for plants to be planted in most of California, not to mention the other states with lots of land.

This method is the cheapest, but is still very effective, and both developed and developing countries could benefit from this method because it removes

PLEASE SEE CARBON, PAGE 2

Pollution affecting the Mokelumne River

KIMBERLY JACOBO SOLANO/HERITAGE ELEMENTARY SCHOOL

The Mokelumne River is being polluted and facing a drought. Good and bad changes can occur. If pollution continues, it can have a negative impact on the plants, animals, and people around it! That is why we need to reuse, reduce, and recycle to help our community.

Finding fossils along the Mokelumne

An interview with EBMUD park ranger Greg Francek

Jacqueline Verdoza and Alexandra Geronimo
JOE SERNA JR. CHARTER SCHOOL

On April 19 we got the opportunity to interview the man who has found the most recent fossils in California, Mr. Greg Francek. We were able to ask him a couple of questions. Let's find out if one of your questions was answered.

Although we couldn't meet him in person we did have the opportunity to talk to him via Zoom. Our questions were separated into topics.

The first topic we touched on was about how many fossils he's found in the past and how rare it is to find a fossil in the area. He replied by saying that he had found some fossils in the past. He also mentioned that it wasn't rare to find a fossil because there are many kinds of fossils. For example, there are tree fossils, shells, and as we know, animal fossils. He showed us a fossil of a camel's foot.

Now, we also wanted to find out some things about him, such as his education and former training. One of the first questions we asked on this topic was, how and where did he learn to properly excavate fossils? His answer was that he learned by experiencing it first hand. He stated that he gets a university level education every time he works. You also don't necessarily need an education to do this kind of job. All you need is curiosity and the process of looking closely and

PLEASE SEE FOSSILS, PAGE 5

Salmon in the classroom teaches about fish's life cycle

Sarah Krutka
TURNER ACADEMY

Salmon are interesting in unique ways. One interesting fact about salmon is that the females lay 5,000 eggs and then they die. They swim in schools. One hundred thirty-seven animals depend on salmon. They have a yolk sack under their body that gives them nutrients. They are capable of changing colors. They swim 1,000 miles in the ocean. They travel a long way from freshwater to saltwater. When the mother lays her eggs, she dies after spawning. They have six life cycles: egg, alevin, fry, parr, smolt, and adult.

The first life cycle stage of salmon is the egg stage. The female lays up to 5,000 eggs. Birds and other fish are threats during the egg stage. The mom uses her tail to cover her eggs. In my opinion, the most interesting thing during this stage is their yolk sac that gives them their needed nutrients.

The third and fourth life cycle stages are the fry and parr. They stay

PLEASE SEE SALMON, PAGE 7

Marine Science Institute gives a hands-on look at the wonders of San Francisco Bay

Isaiah Mansaray
JOE SERNA JR. CHARTER SCHOOL

Me, my classmates, my Spanish teacher Mrs. Azevedo, and my science teacher Ms. Jacinto have been able to go on the MSI trip at the San Francisco Bay.

For those who don't know, the MSI trip is an amazing trip where students from all kinds of schools and grades are able to experience the wonders of the San Francisco Bay. From where we are now (Lodi, California) it takes an average of four hours to get there and back, but every second was worth it.

The trip there was entertaining for sure, but that was nothing compared to the experience we had on the boat. Once we got there we sat down and ate lunch. Besides finding a dead crab and dog coming over to say hello, nothing too interesting happened while we were waiting.

It was finally time. We got our life jackets and we boarded the ship. Once inside, we got the breakdown of what was going to happen.

They explained to us the safety rules and what to do in case of an emergency, after which we got time to explore the inside of the ship. I guess it was a little more

PLEASE SEE MSI, PAGE 4

JOE SERNA JR. CHARTER SCHOOL

A visit to the San Joaquin County Historical Museum

Sarai Teran Rivera and Oscar Vijul
HERITAGE ELEMENTARY SCHOOL

On Tuesday, April 5 our class visited the Cortopassi Avansino building at Micke Grove Park. We learned about innovations in agriculture and crops from our area, including walnuts, cherries, beans, tomatoes and asparagus. We will tell you facts about our favorites, walnuts and cherries.

Walnuts

Did you know that in the past, walnut trees were shaken or hit by people to remove the walnuts? Now there is a machine that grabs and shakes each tree so that the walnuts fall off and can be collected.

Did you know that the Central Valley is California's best walnut growing region? Walnuts are a multimillion-dollar industry in California.

SARAI TERAN RIVERA /HERITAGE ELEMENTARY

Cherries

First the cherries are picked from the trees. Then they are taken by trucks to be processed. Next, the cherries are sorted by color and size. Finally, the cherries are packaged and ready to send to stores.

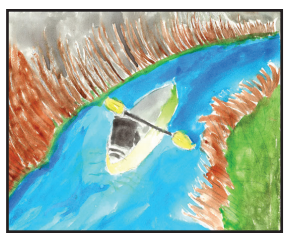
Where do ash and pumice end up after an active volcano?

Sofia Chan
JOE SERNA JR. CHARTER SCHOOL

Initially, what are ash and pumice? Ash and pumice are developed from the eruptions of silica-rich magma, a type of gas that later on expands due to the increasing pressure, which later on escapes and becomes a sticky magma.

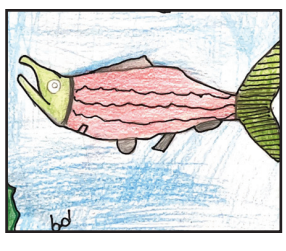
After that, it later expands farther away from the volcano, which then eventually washes into the streams, for example, at the Miocene Zoo.

For a visual representation, I've made a volcano model to further represent where ash and pumice end up.



Poetic tribute to the Mokelumne

After a kayaking trip along the Mokelumne, students wrote poems and painted vibrant watercolors paying tribute to Lodi's river. 3



Fantastic fish, colorful cranes

Young artists depict Sandhill cranes and salmon in a variety of media, including colored pencils, watercolors and painting with the fish itself. 6

Clean up Lodi's watershed

Learn how to reduce carbon in the atmosphere, turn recycled trash into fun crafts, and find other ideas for helping the local watershed. 2, 8

WHAT CAN YOU DO?

How to reduce your carbon footprint and cut excess carbon emissions

Sandra Mashni
TOKAY HIGH SCHOOL

Did you know that according to the World Health Organization, climate change causes 150,000 deaths every single year, and this number is rising? Well, if you did not, you know now.

The definition of climate change, according to the Oxford dictionary, is "a change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels."

If climate change continues at the rate it is going right now, then the Earth will continue to rise in temperature, which will cause devastation to all life on Earth. This does not have to happen, though. There are some ways that you, the reader, can help to lower your carbon footprint, and help to make a better world for the future.

Some ways to help lower your carbon footprint are:

• Reducing the amount of plastics used. Since the production of plastic emits lots of carbon emissions. Reducing the amount of plastics used will help lower the needs for plastics, and therefore will help lower, or even eliminate the amount of carbon emissions from plastics.

• Using cleaner modes of transportation, such as biking and walking. Motor vehicles, such as cars and motorcycles, are one of the biggest carbon emitters used globally. By walking or biking to places more, the amount of carbon used from cars will be reduced, and will help to lower carbon emissions globally.

• If walking or biking places is not applicable, then using public transportation is another alternative. Although public transport does emit carbon emissions, using it will overall use less carbon than using your own car.

• Using less electricity. From unplugging appliances when you go out to turning off lights when they are unnecessary, using less electricity will help to lower your carbon footprint, and save a couple dollars, which is a win-win.

• Recycling as much as possible. Instead of getting one use products, such as a plastic water bottle, try using a reusable bottle instead.

• Reducing the amount of meat consumed. Meat products, such as pork and beef, produce an abundance of carbon and methane, which both contribute to global warming. By eating less meat, your carbon footprint will decrease.

• In the winter, instead of turning up the heater, use extra blankets and thicker clothes. For the heater to work, fossil fuels have to be burned to warm up your home, so by using the heater less, your carbon footprint will decrease, and your gas bill will also go down.

• When shopping, thrift more. Since consumerism uses a lot of fossil fuels, along with not being great for the environment, thrift shopping is another way to help reduce your carbon emissions. Along with helping out the environment, oftentimes thrift shopping is cheaper than buying new clothes and products.

The ways to lower your carbon emissions listed above are not the only ways that carbon emissions can be lowered, but they are some of the most accessible to many people. If every person globally does at least two of these, then globally, we would be able to make lots of progress towards lowering our carbon footprint, and reducing temperatures globally. Now that you have read this article, spread the word to others. Educating people is the best way to get the best results.

HEALTHY PLANET

F	P	Q	A	C	V	S	Z	D	L	J	E	H
X	G	Q	G	A	R	B	S	E	T	C	T	F
D	F	A	C	N	R	V	E	A	U	S	B	D
C	R	I	E	S	V	T	A	D	L	O	C	M
I	K	E	G	B	S	C	E	K	T	G	I	W
H	D	C	C	A	Q	R	G	T	N	L	T	F
Z	J	N	S	Y	T	P	L	S	I	U	S	G
R	E	U	S	E	C	E	A	S	O	Z	A	L
Y	B	K	U	J	S	L	C	H	L	J	L	U
R	L	J	G	A	O	I	E	B	D	M	P	E
D	R	A	O	B	D	R	A	C	B	L	W	X

Bottles Cans Cardboard
Glass Plastic Recycle
Reduce Reuse Steel

ISABEL FLORES/HERITAGE ELEMENTARY SCHOOL

Methods for cleaning and protecting our ocean and rivers

Jocelyn Medina
JOE SERNA JR. CHARTER SCHOOL

Reflect on how you can clean and protect our rivers and oceans.

Protecting our oceans and rivers is important, not just for the animals that live there, but also for the people. It's important for us because the air that we breathe, the ocean produces over half of the world's oxygen and absorbs 50 times more carbon dioxide than our atmosphere.

Overall, the first method to protect our rivers and oceans is to eat sustainable seafood. There are a lot of ways to eat sustainable seafood, buy less plastic and bring a reusable bag.

Second of all, you have the right to vote on ocean and river issues. You may ask how you can do that. If there is an election on any ocean and river issue, don't be afraid to vote, and vote for the right to protect our rivers and oceans. One way to vote is by electing a public official who supports good ocean policies that can help us protect rivers and oceans.

Another way to protect our oceans is to use less water, so excess runoff and wastewater will not flow into the ocean.

There is another way that most people don't do because they are careless. The way to protect our rivers and oceans is to reduce vehicle pollution. Use fuel-efficient vehicles, carpool, or ride a bike.

Above all, another strategy to help and protect our rivers and oceans is to reduce pollution. One way to do that is to choose non-toxic chemicals and dispose of all chemicals properly.

What if you like fishing? Do it properly. Follow "catch and release" practice and keep more fish alive, and respect habitats.

Cut down on the plastic you use every day. Around 8 million to 9 million metric tons of plastic gets into our oceans every year, harming plant life, water quality, and marine animals around the globe.

Here is an example of how we are damaging our oceans: The Great Pacific Garbage Patch is the biggest patch of plastic in the ocean, located between Hawaii and California. Also, keep in mind the ocean covers 71% of the earth's surface but only 2 % of that is protected.

There is a movement in some cities, countries and at certain restaurant chains to get rid of plastic straws, bags, utensils, and other smaller plastic items that can be easily swapped out for something more sustainable. People leave plastic bags in the ocean and sea turtles see the plastic bags and think there are jellyfish when they are really plastic bags, and then they get trapped and die.

TikTok account @lizilivingblue shows that Hawaii and President Biden have pledged to protect 30% of the oceans by 2030.

Think about it like this: Ocean health equals human health.

Another example of how we are damaging our oceans is that 90% of seabirds have ingested plastic, and 100,000 marine animals die per year due to plastic. Also, 100% of baby sea turtles have plastic in their stomachs. Only 9% of plastic is actually recycled.

In conclusion, let's all work together and help our oceans by doing all of these things.

FIND OUT MORE

- oceanservice.noaa.gov/ocean/help-our-ocean.html
- www.livekindly.co/easy-ways-you-can-protect-oceans
- TikTok: @lizilivingblue
- TikTok: @talkcleanmagazine

How to reduce trash in the Mokelumne River

Arianna Parenti
JOE SERNA JR. CHARTER SCHOOL

Recycling your water bottles, Coke cans, Sprite cans, etc., and pretty much anything like that could help save the environment, because if you recycle, the plastic doesn't go into the rivers or oceans. If you recycle, then it will make sea animals in less danger of dying from choking on or being caught in plastic.

There have been millions of sea animals that have died from plastic that was not recycled and was thrown into the rivers. There are still not enough people and petitions to help save the fish in the Mokelumne River and the San Francisco Bay from dying every year from plastic objects like water bottles and the plastic circulars that go on cans of sodas.

Although many people have warned others about the amount of plastic that is being put into the Mokelumne River, not everyone cares about the rivers and the plastic, which I think needs to change.

Picking up trash from the ground can help the fish that swim in the Mokelumne River survive. Since there is already lots and lots of plastic in the Mokelumne River, it makes it even more dangerous for the fish and other creatures that swim at the top of the rivers and close to shore because it is easier for them to get injured or killed by the plastic since there closer to it.

The plastic that is on the ground can and does get shifted into the Mokelumne River and hurts the sea animals because it goes further and further out to everywhere in the Mokelumne River and eventually the San Francisco Bay.

If we pick up the garbage and plastic that is going into the Mokelumne River, it would be a safer area for fish to swim in. I feel as though more people should be involved in picking up trash and plastic from the ground because it will not only be safer for the fish but it will be cleaner for the ecosystem!

CARBON

CONTINUED FROM PAGE 1

harmful gasses from the atmosphere and gives clean oxygen.

Secondly, the most effective method of capturing carbon dioxide out of the atmosphere is direct air capture. Direct air capture involves using machines to capture and remove CO2 from the atmosphere. After the carbon is removed from the atmosphere, it is transformed into a liquid form, and it gets transported underground. This liquid can be combined with hydrogen to create a carbon neutral fuel that is harmless to the environment.

Direct air capture would be located just outside of big cities that emit most of the carbon emissions. This method might be expensive, but the cost would be very worth it to help save our society.

Lastly, biomass waste, such as trash or garbage, agricultural residue, gaseous waste, and forest management can be converted to fuels while still capturing Co2. In this method, carbon dioxide is left behind while biomass is burned. The carbon dioxide that was left behind can be stored underground for later use, or mixed with a substance like concrete and placed on top of the ground.

Using this method, approximately 1.5 million tons of carbon can be removed from the atmosphere in a year. Utilizing this method and methods similar to this one, energy generation and carbon removal could increase by 50 times. This method might not be as effective as the other two, but it would still be very beneficial if people used it.

In summary, our society is in grave danger, but it is not too late to take action. From doing something as simple as planting more trees, to donating money to a foundation that builds air capture systems, anyone can take immediate action.

If our society does not take action as soon as possible, the droughts will only get worse, and animals will continue to die. Although there is still time to react, people should start now.

Let's keep Lodi Lake clean by recycling

Maria Eugenia Mondragon Damian
HERITAGE ELEMENTARY SCHOOL

Let's recycle! Why? If we do not recycle the rivers are going to be polluted. It will be dirty and we do not want that. The rivers need to be clean because animals like fish or turtles can be harmed. Plastic or trash can affect the animals. You may ask yourself how? Well, whenever a plastic enters an animal's habitat it could hurt the animals. What I will do to help is get recycling bags and pick up all the trash.

The students of Beckman Elementary School, Erma B. Reese Elementary School, Heritage Elementary School, Joe Serna Jr. Charter School, Vinewood Elementary School, Turner Academy and Tokay High School would like to thank the following sponsors for their support:

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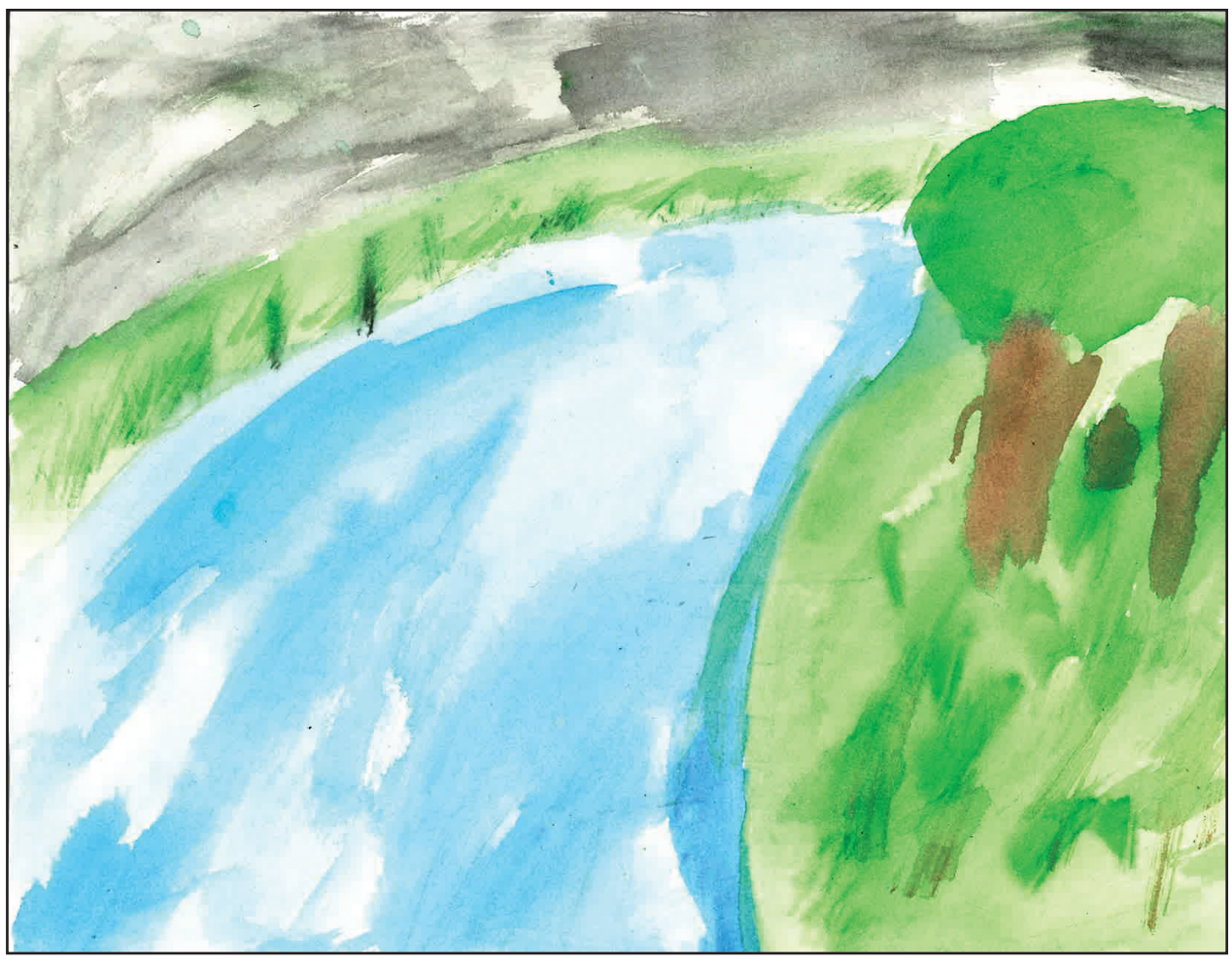
- East Bay Municipal Utility District Ranger staff
- Dr. Cathy Busby, University of California, Davis Professor Emeritus
- Lodi Unified School District Science Curriculum coaches, teachers and students

A RIVER OF POEMS



ALEX JORGENSEN/VINEWOOD ELEMENTARY SCHOOL

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

Lodi Lake

Hope Murphy-Berdahl
VINEWOOD ELEMENTARY SCHOOL

Sitting in a red and blue kayak
With the sun shining on the river
Small islands surround us as we pass
Groups of ducks swim near us in huddles
Looking back it was a wonderful day

Lodi Lake

David Rabara
VINEWOOD ELEMENTARY SCHOOL

Floating down currents of the river
Sky slightly cloudy, sun peeking through, warm as ever
Breeze flowing, making perfect weather,
Leaves blowing by,
Geese flying, ducks floating, fish swimming,
The feeling makes me crave this ...

The Riverside

Alex Jorgensen
VINEWOOD ELEMENTARY SCHOOL

Sitting in a kayak on the calm lake
Clouds fluffy as cotton candy fill the sky
Trees and bushes sway along the riverside
Geese are paddling through the water
I would love to live this experience many more times

Lodi Lake

Courtney King
VINEWOOD ELEMENTARY SCHOOL

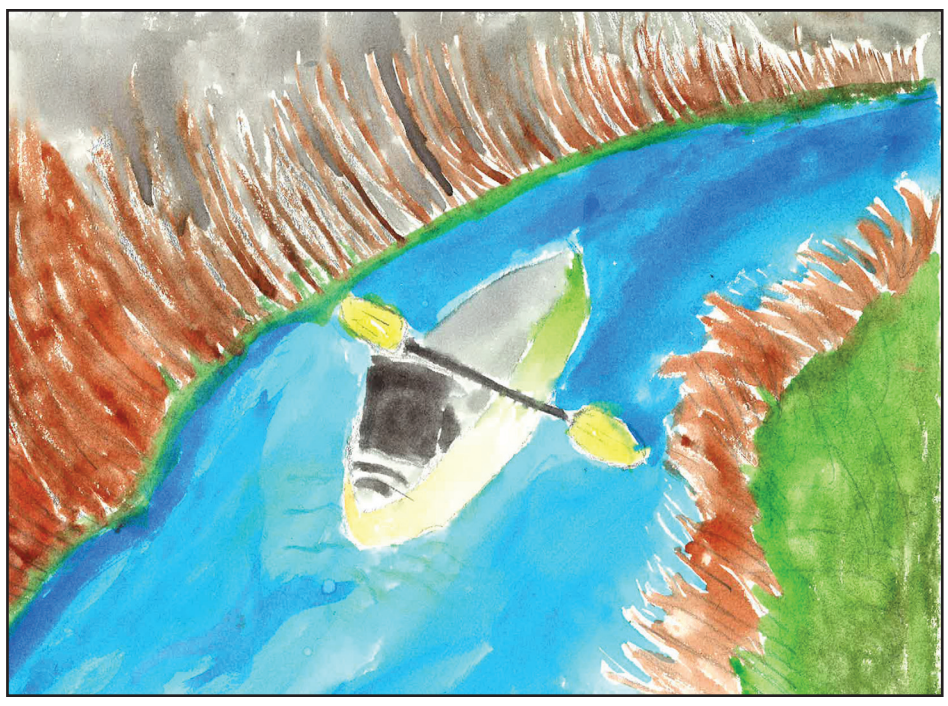
Gazing at the water
Cold water splashing on my face
Wind blowing through the light green leaves
Ducks and swans swimming gracefully
I would go to live in this wonderful moment once again

Lodi Lake

Jayden Basel
VINEWOOD ELEMENTARY SCHOOL

Sitting In The Kayak with a friend to join me
The fish are splashing in the water
The Kayak moving Gently
Calming waters all around
Fluffy Beautiful clouds all around me
Butterflies flying around plants
The water looked calming and relaxing
I would love to come back to this wonderful place

ASHLEY GALLETTI/VINEWOOD ELEMENTARY SCHOOL



HALEY DOCKERY/VINEWOOD ELEMENTARY SCHOOL

In a Dream

Emma Shinn
VINEWOOD ELEMENTARY SCHOOL

The river flowing like the soft breeze in the air
Warm summer air drifting my kayak slowly
The lily pads covered with ladybugs
I can see the blue sky's reflection on the water
What a beautiful sight ...

NATE ANDRIS/VINEWOOD ELEMENTARY SCHOOL

Lodi Lake

Darine Hassan
VINEWOOD ELEMENTARY SCHOOL

Floating in a kayak relaxed, unbothered
The sun is shining against the water
Bushes and trees swaying along with the winds (swish, swoosh)
Ducks paddling their feet making a destination
I'd go to this place again whenever I have the chance.

DARINE HASSAN/VINEWOOD ELEMENTARY SCHOOL

Keep the Mokelumne River clean

Leann Ibrahim
ERMA B. REESE
ELEMENTARY SCHOOL

Have you ever walked at Lodi Lake, and seen the long river, but not known what it's called and any information on it?

Well, this is the Mokelumne River. This river starts from the Sierra Nevada, then flows into the Central Valley, and ends at the San Joaquin River Delta. All of this combined is 95 miles!

In addition, the river is about 15 to 40 feet deep. Also, this river was known for the Gold Rush.

This river is beautiful on the outside, but some things we are doing are not OK for it, or for the animals that rely on the river.

As we know, littering and throwing trash on the floor is common, and it goes to the oceans, lakes, rivers, etc. This is not okay, because living organisms might be living in the river and us putting trash in it is ruining it and can kill it. If something happens to an animal that is important to a food chain, the whole food chain could die!

Also, our water is being polluted, and how will we have clean drinking water in the future if it's all dirty? If this happens too much, we might not survive in the future!

Let's save the rivers and make them clean again!

Want to help? Join the City of Lodi's 2022 Litterati challenge! Download the free Litterati app from the Google Play or Apple App stores. Join the city's challenge with the code "LODI2022." For more information, visit *www.litterati.org/how-it-works*.

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 everything 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 backbone. 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!

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

Maria Romero
JOE SERNA JR. CHARTER SCHOOL

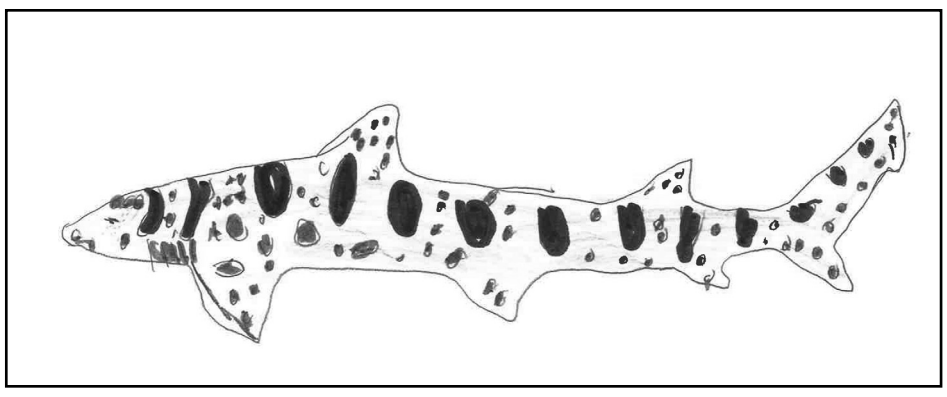
Visiting the MSI was a really fun experience. You might not know what the MSI research vessel is. The MSI research is a four-hour trip on a 90-foot research vessel which is a boat that takes you around San Francisco Bay. When they first told us about the study trip I wasn't sure if I wanted to go because 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

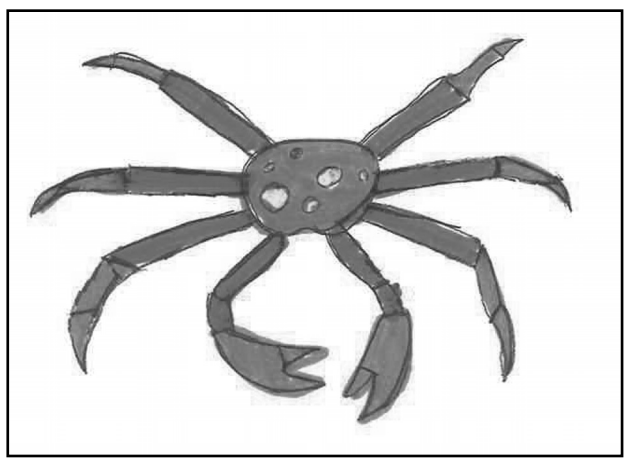
Finding leopard sharks in San Francisco Bay

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



ANGEL FERREYRA/
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 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 fury. 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 into 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.

MSI

CONTINUED FROM PAGE 1

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 in to 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.

FASCINATING FOSSILS & MORE MSI

The secret to making fossils stronger

Elle Paunon
JOE SERNA JR. CHARTER SCHOOL

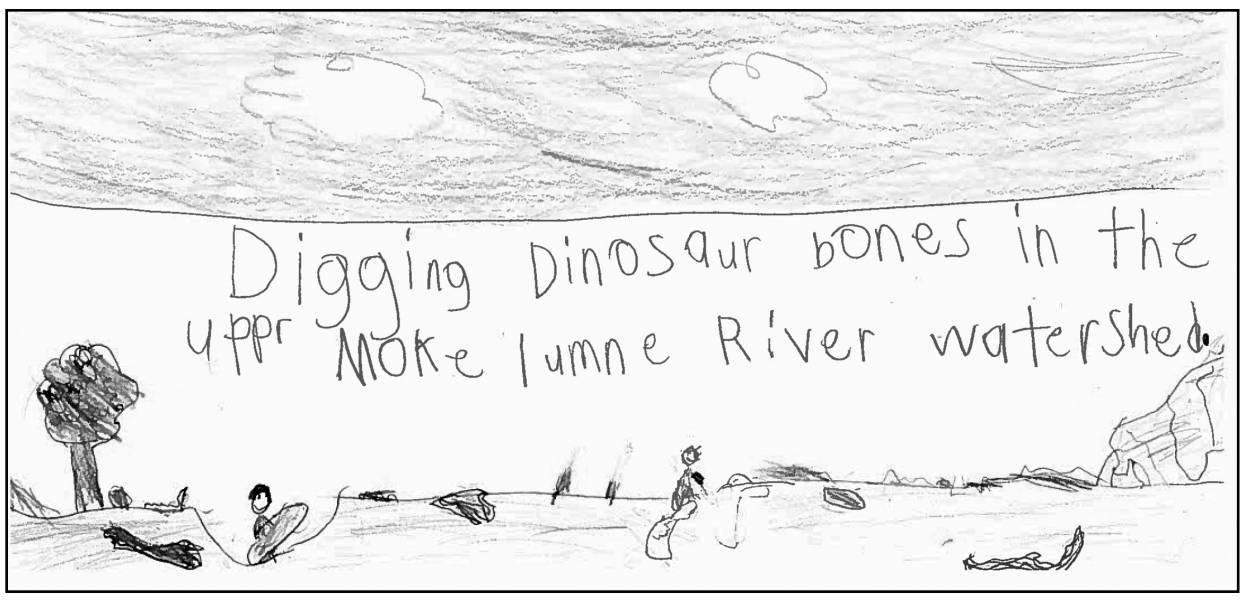
Did you know that fossils were found near our watershed? Well, a ranger, Greg Francek, was walking and doing his usual routine, but then something caught his eye. It was the foot bone of a camel! He then took it back to his lab and examined it further. Then, he used a special substance called butvar to strengthen the fossil.

To start off, when my classmates and I interviewed the ranger who found the fossils, Greg. We asked him what he uses to strengthen the fossils. It turns out that he actually uses a type of special liquid called butvar. I know what you're thinking: "What even is that?" or "He doesn't superglue them?" Well, no, he does not superglue them, but he does use a very similar substance.

Butvar is a thermoplastic, polyvinyl butyral, resin. I actually had no idea what that meant, but what he said in the interview cleared it up. Greg stated that butvar was a mix of tiny plastic balls that melted when mixed with another substance called acetone, and yes, acetone is what some people use to remove nail polish from their fingernails. When the acetone and plastic balls mix, it basically becomes a tough, transparent thermoplastic. If you don't know what thermoplastic is, it's basically a type of plastic that can be shaped, reheated, or cooled multiple times. Pretty interesting, right?

It's very bizarre to think that camels existed right by our watershed such a long time ago, and it's amazing that we were able to discover these fossils after such a long time! And guess what? Scientists can help preserve these fossils using butvar!

Thanks to Greg Francek, we were able to discover a piece of history that none of us would've ever expected coming.



AXEL CABRERA GUTIERREZ/BECKMAN ELEMENTARY SCHOOL

The discovery of prehistoric fossils in the watershed

Joel Villanueva
JOE SERNA JR. CHARTER SCHOOL

Have you ever been to a lake or river? Well, ranger Greg Francek from EBMUD was looking around the Mokelumne River and saw something weird.

Well, that something weird was a mammoth bone sticking out of the ground. That mammoth bone weighed about 300 pounds. It was a whole skull and tusk together. It took 150 hours plus.

Then again he was searching through and found a camel bone. There were more bones found near Valley Springs.

To this day there are still more bones being found in the Mokelumne River watershed.

FOSSILS

CONTINUED FROM PAGE 1

recording your findings. Like Mr. Francek said, "Always look left, right, up, and down."

We were curious about how long it takes for a naturalist to excavate a fossil. We found out that it can be as fast and easy as bending over and picking it up, or it can take as long as multiple weeks if it's a larger specimen. He proceeded to give us an example. One time it took him 130 hours; that's about two weeks of work.

What do naturalists do when they find a fossil? They first take a closer look at the fossils and determine if it is in fact a fossil. Then they will check their surroundings and take pictures. In the pictures they will make sure to include a compass, a pencil, a ruler, and sometimes their field journal. They also use a GPS to know exactly where the fossil is located. The reason for these items is to know the direction, the size (compared to the pencil and ruler) and the field journal to write down observations.

Overall, the interview was a good opportunity to find out things that we never thought about learning. It was interesting to hear what he had to say throughout the interview. We learned a lot of new interesting things. Did any of your questions get answered? Once again, thank you, Mr. Greg Francek, for allowing us to interview you and joining us!

How bees help us, and how to help them

Santiago Eslava Juarez
HERITAGE ELEMENTARY SCHOOL

Facts about bees

Typically bees fly about 12 1/2 miles per hour, but they can fly much faster.

Most bees have short thick bodies covered with hair.

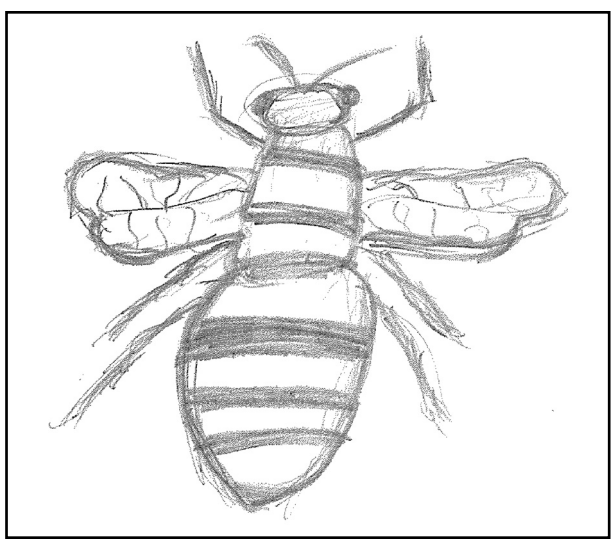
Bees have six legs that are attached to the three parts of their body.

How do bees help us?

There are around 4,000 bee species that are native to the United States, and around 20,000 bee species worldwide. People enjoy eating the honey that bees make. People also value the role that bees play in pollinating plants. Unfortunately, the use of pesticides and expansion of cities are two of the factors that have led to a decline in bee populations. This not only affects humans but also affects ecosystems worldwide.

How can people help bees?

People can help bees by learning how to keep hives. People who keep hives can enjoy the honey and help bee populations.



SANTIAGO ESLAVA JUAREZ/ HERITAGE ELEMENTARY SCHOOL

Stingrays vs. bat rays: How to tell them apart

Erica Tapia Garcia
JOE SERNA JR. CHARTER SCHOOL

On our MSI trip back in October, we were able to see and feel a bat ray. It was a wonderful experience, and I am very grateful to have had that opportunity. Many people tend to mix up stingrays and bat rays with one another, but they are very different in many ways. There are ways to tell the difference between them, whether it's by the way they look, move, or even the way they eat. Today I will talk about those differences.

The first way that you can tell them apart is by their appearance. Like bat rays, stingrays can have a diamond-shaped body, however, the bat rays' pectoral fins are pointed at the ends, while the stingrays' pectoral fins are rounded. Unlike bat rays, stingrays can also have a disc-shaped body. Stingrays normally have shorter tails than bat rays too. The snout of a bat ray can look almost like the beak of a bird, it sticks out and comes to a point where it is very noticeable. Stingrays have more of a flattened triangle snout with not much of a noticeable point to it.

Aside from telling them apart by their appearance you can also tell them apart by their movements. Bat rays move in a graceful way by moving their pectoral fins up and down. Stingrays, on the other hand, move in a more wavy motion helping them move in the water. Bat rays dig into the sand to expose buried prey, and stingrays skim the ocean floor looking for food and sucking the prey into their mouth before fully digesting them.

Apart from their looks and movements, you can also tell the two apart by their habitat or the things they eat. Bat rays live in muddy or sandy places as well as estuaries, and bays along Oregon and California coasts. Stingrays are found in the shallow coastal waters in seas usually buried, they can also be found in freshwater. Bat rays eat small fish, mollusks, and crustaceans, while stingrays eat worms, clams, and shrimp.

In conclusion, even though a lot of people mix up bat rays and stingrays, there are many differences to tell them apart. From their appearance, to how they act, and even where they live or what they eat. I hope you learned how to tell them apart after reading this.

SAMANTHA SANTOS/HERITAGE ELEMENTARY SCHOOL

Gold Rush left mercury in San Francisco Bay

Andy Quintana
JOE SERNA JR. CHARTER SCHOOL

I had the chance to go on a study trip with the Marine Science Institute. One thing we learned about was mercury in the bay. Mercury is a very heavy metal that is toxic to animals and humans when ingested.

The mercury got in the bay because of the Gold Rush in 1849. Miners would use mercury to clump up the gold to make it easier to find. They would do this by using a method called hydraulic mining.

The miners would have a big machine. They used the machines to put mercury inside the dirt and soil to clump up the gold. The mercury and gold would combine to make an amalgam. They would heat it up to evaporate the mercury.

Some of the mercury would stay in the soil. That mercury would end up in rivers and streams that led to the San Francisco Bay.

Facts about zooplankton

Jayson Herrejon and Max Hernandez-Velasquez
JOE SERNA JR. CHARTER SCHOOL

Have you ever wondered how many types of zooplankton there are?

There are so many different species in the world than there are parrots in the world, and maybe there are lots yet to be discovered.

Zooplankton is separated into two types. One type of plankton is the meroplankton and the other type is the holoplankton. Meroplankton is the larvae type of zooplankton that don't stay small for long and grow into fish, crabs and other animals, while holoplankton on the hand is clear plankton that stays small and is a drifter for the rest of their life. A drifter is plankton that moves in the water's direction.

Zooplankton is not phytoplankton which are just photosynthetic organisms. They are different because zooplankton means the animal type of plankton.

An example of a zooplankton is a moon jellyfish. Moon jellyfish are plankton because they are drifters, which means that they follow the direction of the water.

Zooplankton can also reproduce quickly. They are also the prey for many predators such as small fish like sardines, carnivorous copepods, and chaetognaths.

In conclusion, zooplankton are really interesting and they are such cool animals. They also help so many animals within their food chain and we've found out many interesting things about them.

What is a Van Doorn bottle?

Jade Ambriz and Aaron Trejo
JOE SERNA JR. CHARTER SCHOOL

Have you ever heard of a bottle that can collect water samples? It's called a Van Doorn bottle! Its scientific name is oceanographic bottle. Another name people use for the Van Doorn bottle is the Nansen bottle.

The Van Doorn bottle allows samples to be taken at different water depths. It is designed/modeled horizontally because it makes it easier to collect water samples. It makes it easier to collect the water samples because when it is lowered into the water, the water goes straight into the Van Doorn bottle. There is a rope attached to the Van Doorn bottle so it can be lowered into the water without losing the bottle. To close the bottle you need to drop a metal thing (which is also attached to the rope) down onto the Van Doorn bottle.

Now let us tell you about our experience while using the Van Doorn bottle. It was confusing and awesome. It was confusing because our instructor had us figure out how to use it instead of her just showing us. There were a lot of steps to figure it out but in the end, we ended up figuring it out. Our instructor also let us help collect water samples after we figured out how to use it. Overall, it was an amazing experience being able to go on the MSI trip and be able to use it.

The person who designed a water sampling bottle was Fridtjof Nansen in 1894, and Shale Niskin improved it more in 1966. It's a big year gap because it took time to improve the Van Doorn bottle and they didn't have the right products or materials to improve it.

How climate change will affect the Bay

Vanessa Ha
JOE SERNA JR. CHARTER SCHOOL

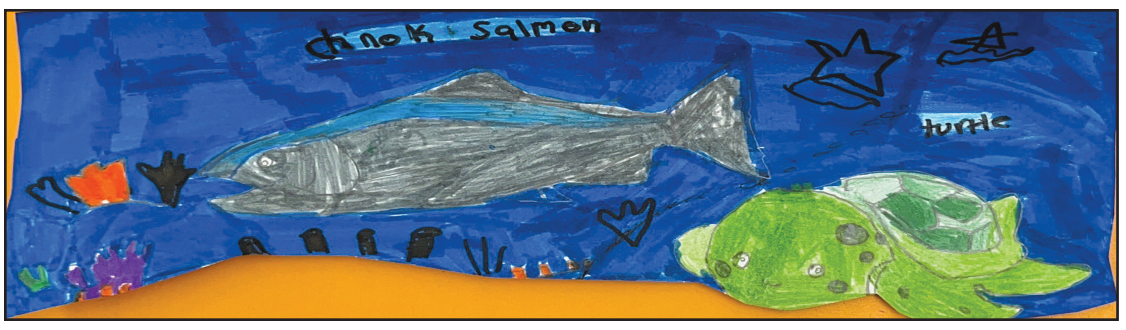
What do you think life around San Francisco Bay will look like in the upcoming decades? There are many ways that global warming can and will affect our beloved bay, as climate change is sure to have some sort of effect on it. One example is the major shift in species that are found in that environment.

With the rising heat, certain animals like leopard sharks are noted to do badly in temperatures above 70 degrees Fahrenheit. According to Surfforecast.com, the current temperate of San Francisco Bay is 67 degrees Fahrenheit. With global warming, the bay is only going to grow hotter and hotter. This will certainly cause the leopard shark to either move away from the bay to an ecosystem likely not as suitable, or for them to die due to the warm waters.

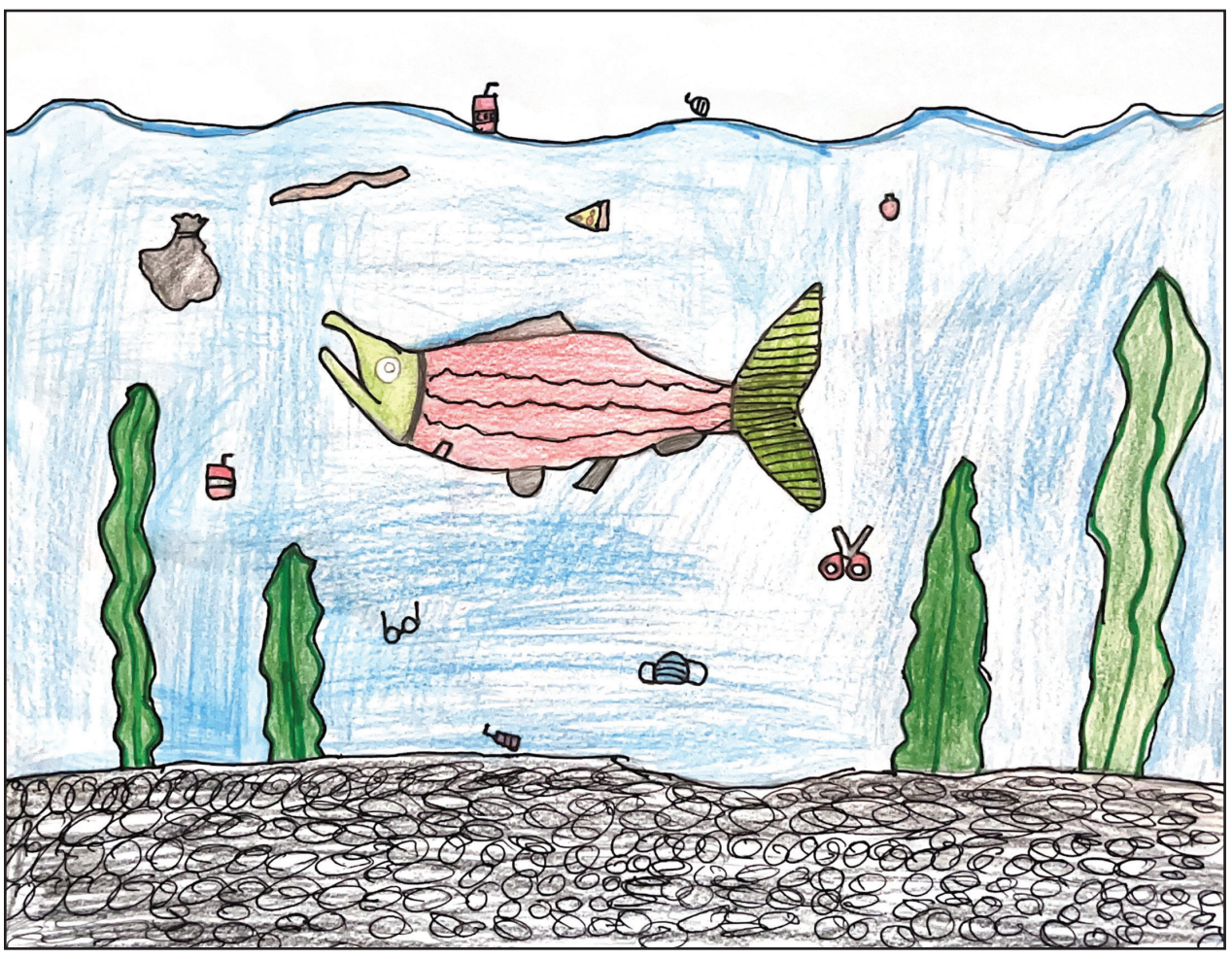
As a consequence of climate change, we could lose the creatures we so dearly admire. Global warming won't just affect the leopard shark, but surely many other animals currently inhabiting the bay. And in the near future, we would lose — and gain — many sea animals.

FANTASTIC FISH & COLORFUL CRANES

AMEER IHDAIB/BECKMAN ELEMENTARY SCHOOL



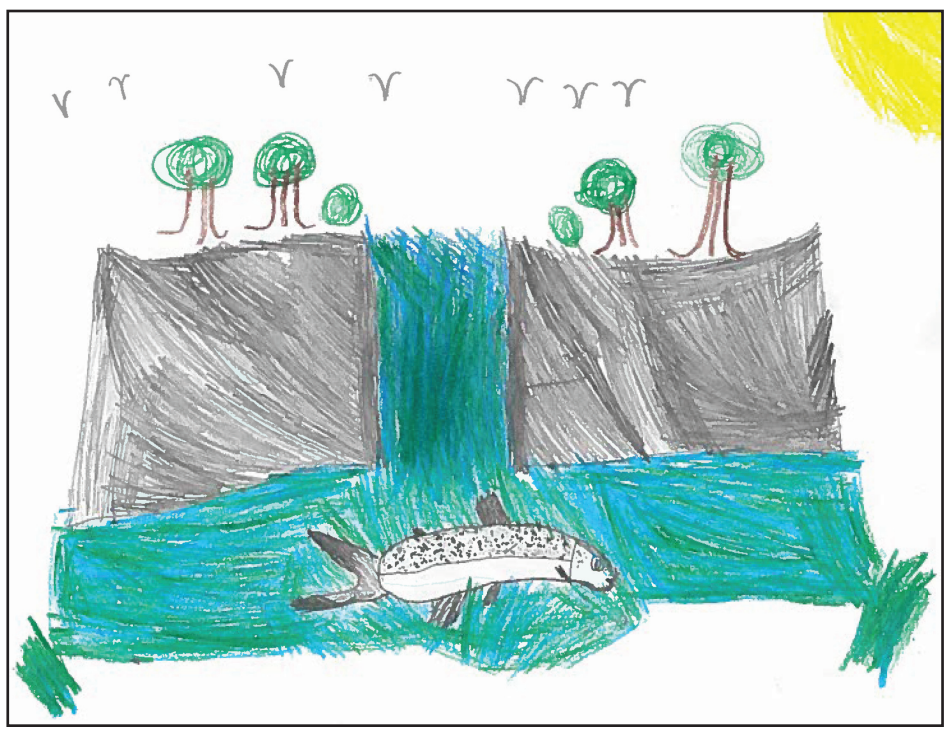
MARIA EUGENIA MONDRAGON DAMIAN/HERITAGE ELEMENTARY SCHOOL



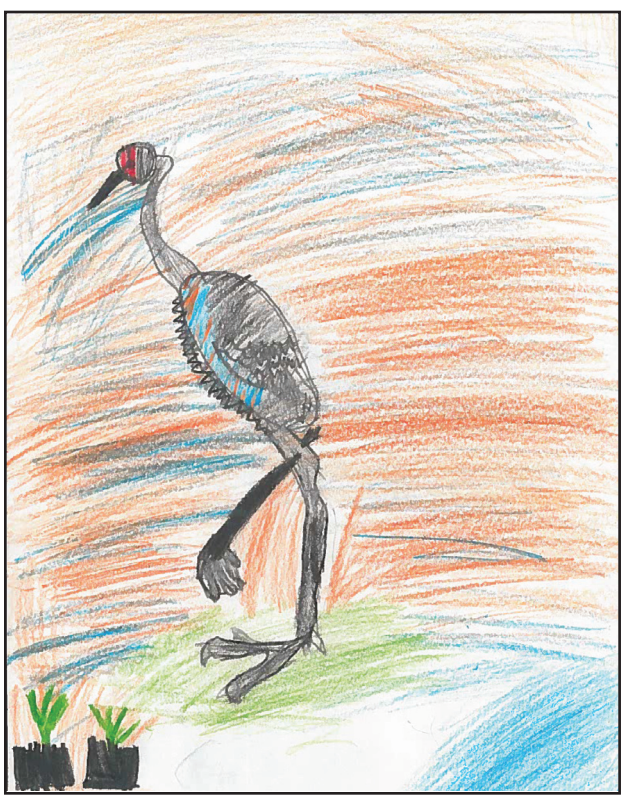
ANGEL NAVA/HERITAGE ELEMENTARY SCHOOL

JAELYNN HERRERA/
BECKMAN ELEMENTARY SCHOOL

AMNA IQBAL/HERITAGE ELEMENTARY SCHOOL



MELANIE PEREZ/BECKMAN ELEMENTARY SCHOOL

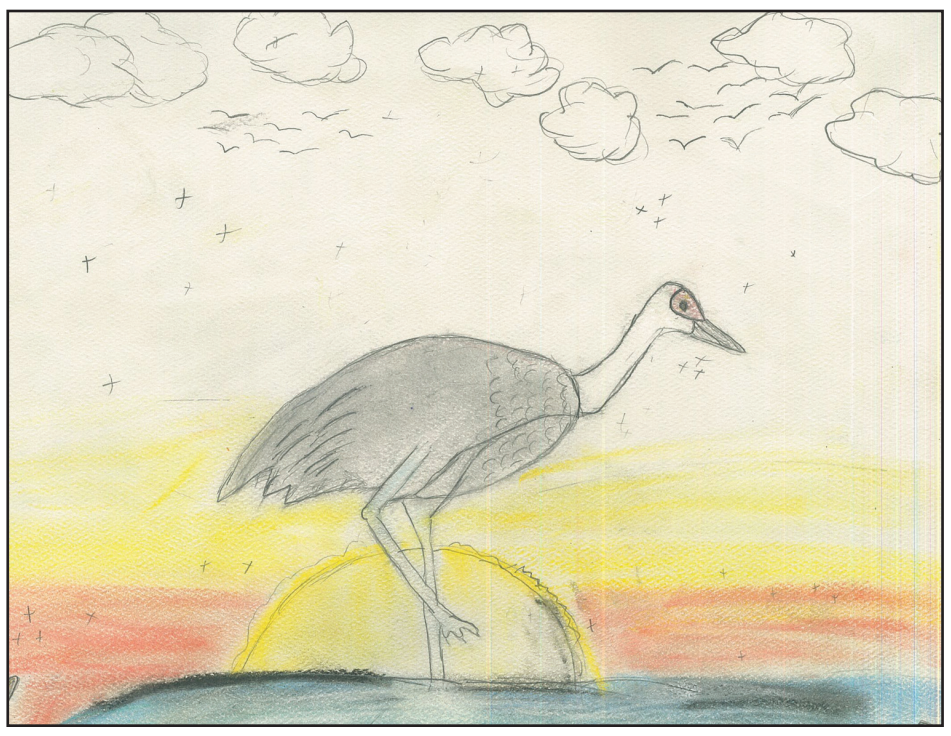


RICHARD WASHINGTON/
BECKMAN ELEMENTARY SCHOOL

MELYNA RAMOS/
HERITAGE ELEMENTARY SCHOOL

VALERIA DE LUNA/
BECKMAN ELEMENTARY SCHOOL

GUADALUPE MALDONADO/HERITAGE ELEMENTARY SCHOOL



DELANI TOMAS ARENAS/HERITAGE ELEMENTARY SCHOOL

FISHY DISCOVERIES

Raising salmon eggs in the classroom

Giselle Santos
JOE SERNA JR. CHARTER SCHOOL

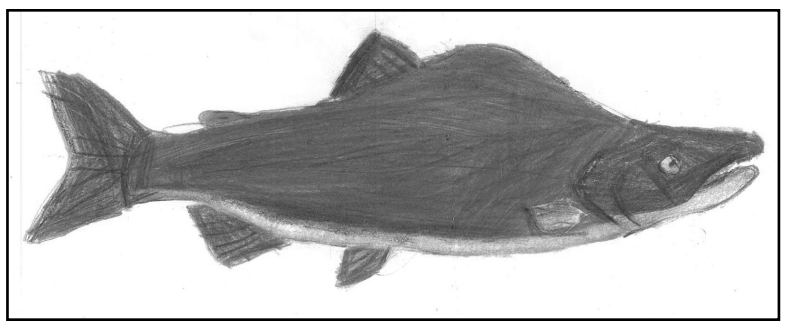
This year, Joe Serna's seventh graders had the privilege to raise baby salmon eggs. Students had the amazing experience of observing the first stages of a salmon's life cycle.

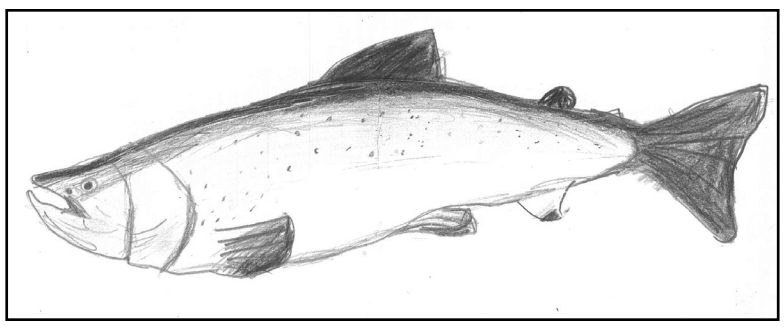
To begin with, students watched the eggs turn into alevin. As students observed the interesting changes, activities were done to deepen students' learning about a salmon's life cycle. For example, students had data sheets where observations were recorded. Some of the data collected was temperature changes. In addition, students wrote daily journal entries about their observations made in regards to physical changes.

Once the alevin turned into fry, they were ready to be released. Both seventh-grade classes went on a study trip to release the salmon into the Mokelumne River.

Students further learned many interesting facts about salmon eggs and their life cycle during the trip. One thing I personally learned is that salmon play a vital role in the ocean ecosystem. Therefore, our oceans should be cared for, so that not just salmon, but all marine animals may thrive.

Joe Serna students thoroughly enjoyed learning about salmon and their life cycle. It gave students a rich learning experience.





BRAYAN VILLAMAR ALVAREZ AND LUIS DIAZ/HERITAGE ELEMENTARY SCHOOL

Want to learn more about salmon? Start here

Brayan Villamar Alvarez and Luis Diaz Lopez
HERITAGE ELEMENTARY SCHOOL

Life cycle: When salmon are born they then travel from freshwater to the ocean. After that they then travel to where they hatched. They do that to lay eggs and then they die, I know it's sad. According to Google, it happens because they stop eating and return to freshwater and are left with no energy which makes them die. They live up from 2 to 7 years.

Physical features: The Atlantic salmon weighs 12 pounds which is 5.5 kilograms. Pink salmon weigh about 3 to 6 pounds. When in the ocean they have dots on their back they also have a silver color. During the breeding season they undergo changes in color that vary by species. A female spring Chinook salmon can carry more than 4,000 eggs. Salmon also have a good sense of smell.

Habitat and endangerment: Salmon are currently endangered because humans have destroyed or contaminated their habitat. Salmon are also sensitive the the rising water temperatures. A salmon's habitat is tributaries of the Pacific ocean, and Atlantic Ocean.

What we learned having salmon in the classroom

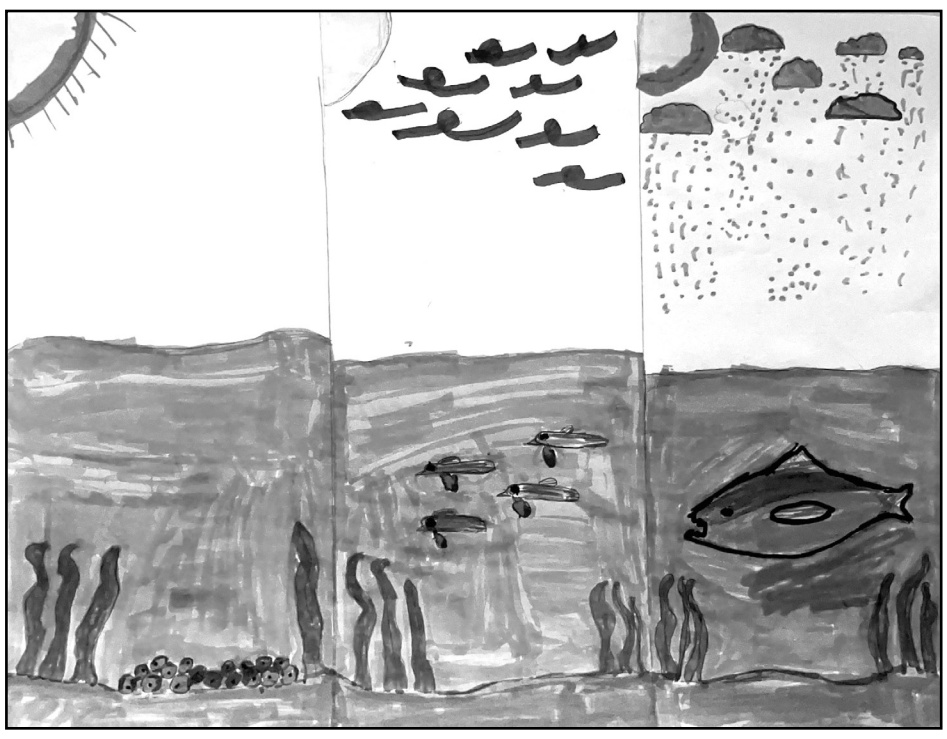
Rosalie Santibanez
JOE SERNA JR.
CHARTER SCHOOL

It was fun when we first had the salmon eggs in the classroom. It was a fun experience on how we stayed with them as they grew into little fish. It was cute how they were so little and then they started to hatch. They were fun watching them grow really big into their normal size.

Then the seventh graders went and released the salmon in the Mokelumne River and they went swimming away into the water.

Next, the salmon will eventually go back into their own home where they came from. When the salmon were here they would go in front of the screen and say hi to the whole classroom. We got the eggs on January 13 and it was really fun. At last, the salmon were released on March 3.

We are all glad that we got a chance to have salmon eggs in the classroom. This is probably the only chance to have them in the classroom.



ULISSES REYES MARTINEZ/HERITAGE ELEMENTARY SCHOOL

How much do you know about California halibut?

Kaleb Cossio
JOE SERNA JR.
CHARTER SCHOOL

The California halibut is a fish part of the pleuronectidae family and it's a fish that blends in with the sand in the bottom of the ocean. The fish can grow up to 8 feet long and 500 pounds. Some of its favorites things to eat are the Pacific sardines, northern anchovies and the Greenland halibut.

The California halibut lives in the sandy bottom of the ocean. Some of its predators are the bottlenose dolphins, angel sharks, sea lions and humans. The California halibut can live up to 40 years. This fish blends in with the things it touches such as sand, rocks, and mud so it can hide from predators, but when they do see one they use their tail which is very strong to swim away.

Some fun facts about the California halibut is that female halibuts can lay up to 2 to 3 million eggs yearly depending on their size.

They can be very aggressive to humans if they are disturbed. Halibuts live down to 18 to 60 feet deep in the water, and their spawn seasons are February through July.

Studying the life cycle of Chinook salmon

Alexi Coughlin
JOE SERNA JR. CHARTER SCHOOL

The life cycle of a Chinook salmon is a very interesting process! The process starts when the baby salmon are in tiny orange, red or pink eggs.

When they hatch they become alevin (sac fry). In their alevin stage, they have a yolk sac attached to their stomach, a yolk sac is a sac of nutrients that the salmon absorb and get nutrients from. During the time they have the yolk sac they cannot swim because it weighs them down, therefore they flop around the rocks instead.

Once they fully absorb their yolk sac they become fry. When they are fry they are finally able to swim!

The next stage of their life is parr. This is when they develop dark markings on their sides.

Once they become bigger and swim out to the sea they are smolt.

After that, when they have been in the sea for about 1 to 8 years they become an adult.

The last stage of their life is a spawning adult when they spawn and die, and the cycle starts over again with new baby salmon!

My class at Joe Serna got the privilege to raise baby salmon in our science classroom with Mrs. Jacinto (Joe Serna's middle school science teacher) from when the salmon were eggs to when they were fry. Then they had to be released. I loved learning about them and watching them grow!

Fast facts about California's native pipefish

Jennifer Nieves
JOE SERNA JR. CHARTER SCHOOL

Pipefish are known to be related to seahorses.

Like seahorses, male pipefish give birth instead of the female pipefish. They have a specialized place in their belly for that.

Pipefish make clicking noises while feeding because of their bony skull. Pipefish are carnivores. Pipefish can go up to 3 weeks without eating.

Pipefish have tiny tails that can barely be seen by the naked eye.

Pipefish live up to 5 to 10 years. They grow up to 8 inches.

All about diamond turbot

Juan Cerros
JOE SERNA JR. CHARTER SCHOOL

Did you know? The diamond turbot got its name because it has a diamond-shaped body. It can reach up to 46 centimeters (18 inches) in length. It has both eyes on the top.

The diamond turbot lives in subtropical water, on sand or mud bottoms at depths of up to 50 meters (which is 160 feet). Its diet is invertebrates such as polychaetes, mollusks, and shrimps.

Lastly, the diamond turbot has a really silky, slimy feel.

The general geographic location of this fish ranges from Cape Mendocino all the way to Cape San Lucas, Baja California, and the Gulf of California.

The male can live up to 20 years, and the female can live up to 25 years.

The usual color of the diamond turbot is sandy-brown to gray with blackish or greenish specks scattered throughout the body and extending onto the fins.

Are salmon alevin actually meroplankton?

Alex Bishop
JOE SERNA JR. CHARTER SCHOOL

I recently went on a study trip to a research vessel and my teacher mentioned that the fish larvae on a chart about plankton looked a lot like an alevin. I hadn't thought much of it at first but when my teacher mentioned it again in class I decided to look more into it. I looked into a lot of websites and all they said were that salmon eat meroplankton, nothing about alevin being meroplankton.

If you look at how the alevin move and how they hop around they kind of seem like meroplankton. My science teacher went on the same research vessel with sixth graders and she came back and told us that one of the scientists said, "Can they swim?" and since they can't swim, the scientist told my teacher that as long as they couldn't swim, they were meroplankton. After some research and data searching, I have finally found the answer to my question, "Are salmon alevin meroplankton?"

Salmon word Puzzle

P A E L F G L M A O L O L
S I F M F E E R G R J K W
E A A T T G E O O T E S Z
P E L R N I M I L T L O S
S M T M O L G L Z Y A F E
L A M P O N F Y W L L F M
F R E D D N O O W L E V B
R D P A R R G T J V V S R
G E T H E N G L M S I S Y
T S F R Y S I I O L N G O

SALMON
EMBRYO
FRY
PARR
ALEVIN
MILT
REDD

LESLEY ALVAREZ/JOE SERNA JR. CHARTER

Releasing salmon in the river

Nathalie Bautista
JOE SERNA JR.
CHARTER SCHOOL

This year, we went on a trip to release salmon that we had in our classroom. It was nice to have them because we saw them grow each day. It was also a very beautiful day when we released them.

March 3 was the day we got to release the salmon. We release them by the hatchery.

First, when we got there it looked very much like a natural forest but the walk to where we were released was long. The drive was also not too long since it was a bit close to the school.

Then we got to a small place where the salmon were put into cups. Also, we got to name our fish before we got to release them. I named my Jimmy since the fish looked like it had some pretty big eyes when you saw it through the cup. That was when we got to release our fish. When I got to release mine it went to the left and swam away far.

After that, we went to some stations and learned some new things. I learned more about their body parts and how each of their fins does specific things, and we got to touch a fish but it was dead, sadly.

Another thing is we went to go on a nature walk and we played a fish game about their life cycle. It was pretty funny and then we had different roles in the game such as the fisherman, the salmon, and the predators. That was my favorite part and the best experience on this trip.

Overall I had so much fun going there because I liked how us seventh-graders had the opportunity to release the salmon we took care of and watched them grow throughout that month in the classroom.

I really hope we get to do this another time. Maybe you can get a chance to do it too!

SALMON

CONTINUED FROM PAGE 1

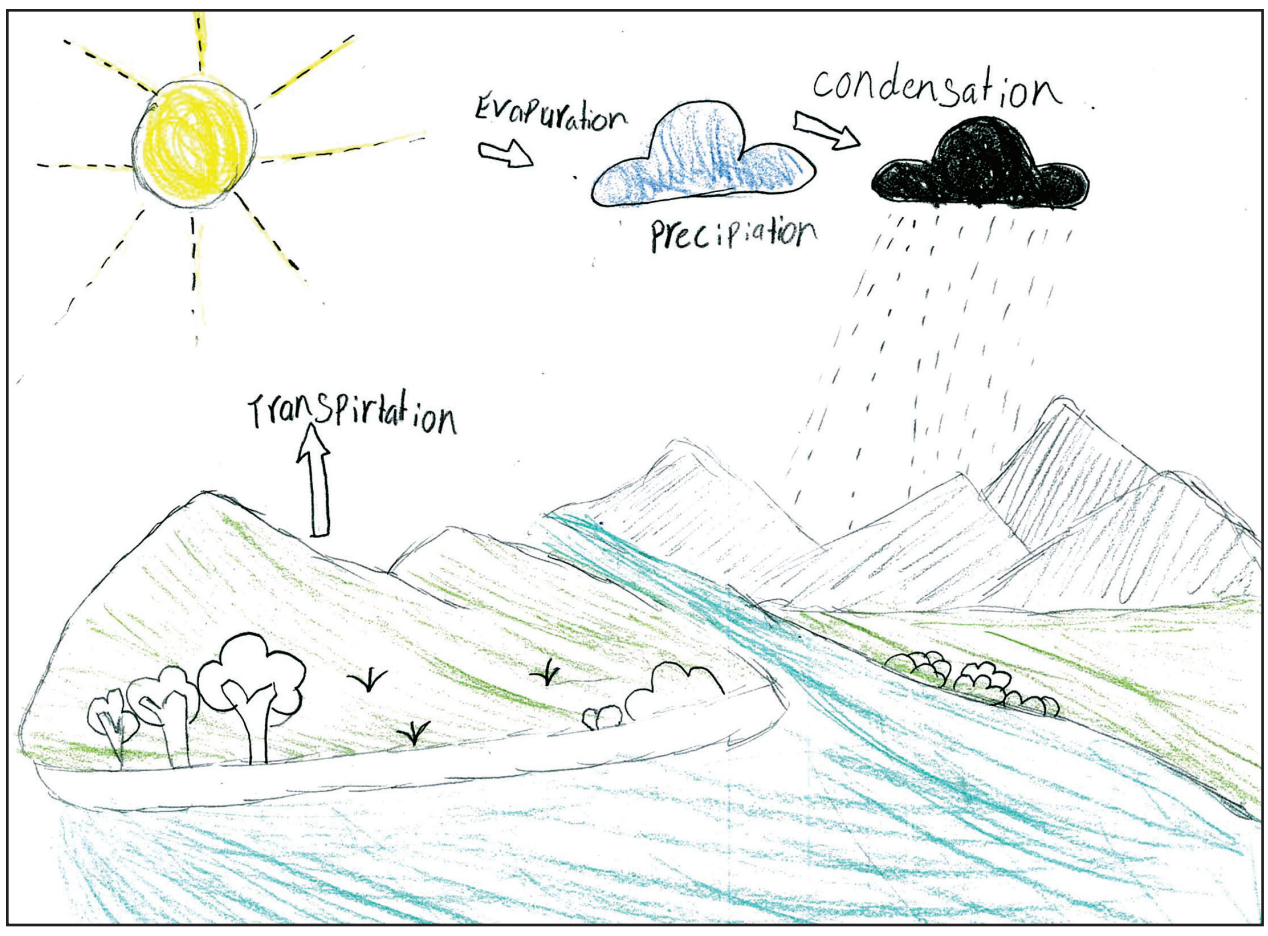
in schools for their safety. Their food source is plankton. They are camouflaged into their redd with spots. In my opinion, the most interesting thing during this stage is they know when to hide when they feel endangered.

The fifth life cycle stage of salmon is the smolt. They migrate into an estuary to get used to salt water. They begin to camouflage to the color silver for the ocean. Their daily meals are plankton, small fish and insects. In my opinion, I think the most intriguing thing during this stage is their capability of camouflage.

The final life cycle stage of salmon is the adult stage. They spend up to seven years in the ocean. Their predators are orcas, sharks, dolphins and large birds. I think the most interesting thing during this stage is their countershading.

Salmon are intriguing fish. They can camouflage to blend in with the ocean. Another reason why they are intriguing is because they travel from an estuary to saltwater to freshwater. My last reason for why they are intriguing is because they eat tiny plankton. I never thought salmon would be so interesting.

HELPING THE PLANET



JESSICA BAUTISTA OSORIO/HERITAGE ELEMENTARY SCHOOL

Do you know these facts about water?

Jessica Bautista Orsorio
HERITAGE ELEMENTARY SCHOOL

Water is the most important liquid on Earth.

It covers over 70% of Earth's surface.

Water is made of tiny units called molecules.

Salt water can be desalinated and used for humans to drink and use in irrigation.

The sun, air and gravity work together to create the water cycle, pictured above.

Different ways to repurpose and use recyclables

Camila Maldonado
JOE SERNA JR. CHARTER SCHOOL

CAMILA MALDONADO/JOE SERNA JR. CHARTER SCHOOL

Water filter

Step 1: Cut a soda or juice bottle in half.

Step 2: Place top part of bottle onto the bottom part upside down.

Step 3: Place cotton balls, cloth or a coffee filter inside the bottle as the first layer (two to three centimeters thick).

Step 4: Add three to five centimeters of activated charcoal as the second layer.

Step 5: Over the charcoal, add about three centimeters of fine sand.

Step 6: Add about four centimeters of gravel or small stones over the sand.

Step 7: Add the rocks to the bottle as the final layer.

The small stones are used to filter out large sediments, the sand is used to remove fine impurities, the activated charcoal removes contaminants and pollutants through chemical absorption!

Bird feeder

Step 1: Near the bottom of the bottle, cut a little hole into the side, a bit bigger than the spoon. Poke the spoon handle through it until it hits the other side, cut a small hole there so the handle goes through.

Step 2: Repeat Step 1 higher up on the bottle for the other spoon.

Step 3: Tie some string around the neck of the bottle as a hanger for the birdfeeder.

Step 4: Fill the bottle from the top with the birdseed and hang your feeder outside for the birds to enjoy. The seeds will fall into the spoon as the birds eat it!

Watering can

Step 1: Find a large, plastic bottle or jug with a handle, a large jug without a handle will work just as well as a milk jug with a handle you can also use a regular water bottle.

Step 2: Clean out the bottle, fill the bottle with water, then close the cap shake the bottle. Pour the water out. Do this a few times. If there is a label, peel it off then remove any residue.

Step 3: Poke 6 to 15 small holes in the bottom of the bottle, 5 to 6 if you're using a water bottle.

Step 4: Poke a hole in the cap of the bottle, a little bit smaller than your thumb.

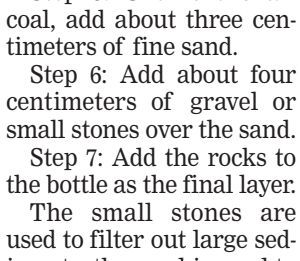
Step 5: Fill a bucket with water, put your bottle in, when the bottle is filled put your thumb over the cap.

It fills up through the holes in the bottom. Put your thumb over the top and the water won't spray out, take your thumb of to let out the water.

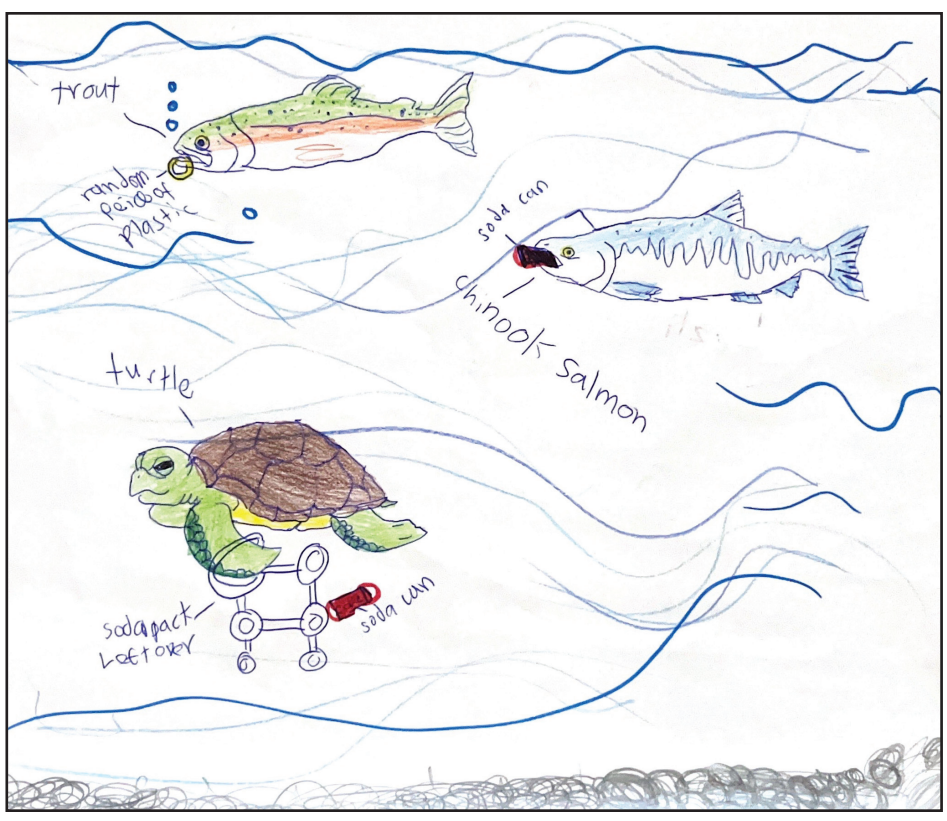
How to help

Muhammad Azaan Khan
HERITAGE ELEMENTARY SCHOOL

Why do people litter? When people throw bottles and trash on the ground, it is bad for the animals. The litter can harm the animals. For example, they can get diseases. What can you do? You can pick up your wrappers and throw them in a garbage can.



MUHAMMAD AZAAN KHAN/HERITAGE



LEZLI RODRIGUEZ/HERITAGE ELEMENTARY SCHOOL

Educating about the watershed at the NorCal Science Festival

Adam Elias Farinelli
JOE SERNA JR. CHARTER SCHOOL

On April 23 of this year I had the opportunity to help at the NorCal Science Festival. I helped Mrs. Kathy Grant, City of Lodi watershed educator, at the watershed station.

I learned a lot of things I had not known before. For example, the watershed is a large area of sloped land where our drains and much more lead to. I also learned that we can simply help keep a healthy watershed by washing a car in a location not near any storm drains, or simply picking up trash. This is because all those chemicals, soap, and trash are not good for the watershed. All those chemicals and other things can harm our wildlife.

I also learned that the Sacramento River watershed is the biggest watershed in California. If you did not know, our watershed is the Mokelumne River, and our water supply comes from the Mokelumne River.

In conclusion, I learned a lot at the NorCal Science Festival.

Jellyfish – the fascinating plankton

Jesse Ferreyra-Vasquez
JOE SERNA JR. CHARTER SCHOOL

Jellyfish are very fascinating animals. Some types of jellyfish can weigh up to 440 pounds, others can weigh no more than 20 to 30 pounds. They can grow from 15 to 100 feet in length counting the tentacles.

Most jellyfish live for less than a year, some jellyfish live for only a few days, and a few types of jellyfish are immortal. Jellyfish predators are other jellyfish that are bigger and stronger.

Jellyfish are the largest plankton in the world.

The people injected by the toxin of the jellyfish are outrageous. There are about 150 million people stung every year. It's crucial to stay away from these creatures.

There are 20 to 40 stings annually in the Philippines. The venom is called Nematocysts, and it is very dangerous for humans. This toxin is located on each tentacle of the jellyfish. The toxin gets inserted when a living thing has contact with the jellyfish.

Not all jellyfish are poisonous, or harmful to humans. Only around 70 species of jellyfish can leave severe wounds in humans. Out of the 70 species of jellyfish that are harmful to humans, only 65 species are aggressive. It is crucial to stay away from these amazing creatures because they can be very aggressive and kill people around them.

Jellyfish are drifters that go with the flow of the water. Their tentacles can measure around 10 feet long for most species. Other species can grow tentacles up to 50 feet. Their tentacles are their main defense. It helps them protect themselves from predators. Jellyfish have 4 to 8 tentacles but sometimes they have more. Jellyfish like going with the flow.

More than half of the jellyfish species are bioluminescent. Bioluminescent means they can glow in the dark. This helps them against predators. The light scares the predators away. They form a chain that confuses the predators and makes them leave.

Jellyfish can go very deep into the ocean. They can go up to 9,000 meters or 30,000 feet deep. There the main source of food is found deep in the ocean.

If people see jellyfish at the night they will be amazed at how cool, and gorgeous they look. The jellyfish that are bioluminescent are one of the most fascinating things in the world.

Their species are incredibly populated. There are 2,000 known species of jellyfish by humans. Scientists affirm that there are over 300,000 species of jellyfish not known by humans. They predict that most of the species unknown are very deep down in the ocean. They think they are bioluminescent, and that they are way bigger than the species humans know.

Jellyfish are found all over the world. Some are found in the ocean, others are found in fresh water, and others are found in the sea. Jellyfish are more popular to see in the ocean because there are more species there.

The most popular species of jellyfish is the box jellyfish. Jellyfish are incredible creatures, and there are a lot of species of jellyfish.

All about Pacific sanddabs and speckled sanddabs

Estevan Frias
JOE SERNA JR. CHARTER SCHOOL

What is a Pacific sanddab? The Pacific sanddab is a species of flatfish. The Pacific sanddab belongs to the Paralichthyidae family. The Paralichthyidae family is also known as the large tooth flounder family. All combined, the large tooth flounder family consists of approximately 110 various species.

The Pacific Sanddab is endemic to the Northern Pacific Ocean. They go from the Sea of Japan to the coast of California. They are most abundant off North-Central California and Southern California. The Pacific sanddab has a lifespan of 9 to 10 years. They spawn multiple times during the spawning season, which is through July and September. Female Sanddabs produce numerous eggs.

The Pacific sanddab lives in mostly sandy and muddy areas at depths of 30 feet to 1,800 feet.

The Pacific sanddab usually lives in shallow waters when they are young, but they are also found in tide pools. The Pacific Sanddab lives among many different animals. They live among rays, crustaceans, cephalopods, flatfish, and bottom feeders. They eat small fish, cephalopods, crustaceans, and surprisingly, their own eggs. Due to the way they look, they can easily camouflage in nestles to hide from their predators. Some of their predators include sharks, rays, and halibut. The Pacific Sanddab is fished commercially and recreationally by humans.

The Pacific Sanddab has very interesting characteristics. They have an elongated body, and sometimes even have an oval body. Their color ranges from dull brown to tan. They also have circled spots on their bodies. The color of the spots can go from white to pale brown.

Freshly caught sanddabs will have dull orange spots and blotches.

A fish that's very similar to the Pacific Sanddab is the Speckled Sanddab. Just by the name, you can probably assume that they are very similar. The speckled sanddab is also one of the members of the Paralichthyidae family. The speckled sanddab is known as the smaller cousin of the Pacific Sanddab. The speckled sanddab can grow up to 6 inches in length, which is just about the same size as a Pacific Sanddab. However, the lifespans are very different. The Pacific Sanddab can live up to 10 years. On the other hand, the speckled sanddab can only live up to 4 years. The speckled sanddab is mostly found in the waters of Mexico, but can also be found on the coast of California. One of the differences between the two is that the speckled sanddab is more speckled rather than mottled, like the pacific sanddab. Another difference is that the pectoral fins are a little shorter than the fins of the pacific sanddab. These two fish are very similar.

Now that we compared the Pacific sanddab to the Speckled Sanddab, we know more about the Paralichthyidae family. It is a very big and interesting family. The Paralichthyidae family has over 240 species of fish. They are all very unique, and the pacific sanddab is one of them. Its features and characteristics make it a fascinating species.